







Social and Environmental Impact Assessment (SEIA) Addendum for GAC's Bauxite Export Project, Guinea

Volume 2

- Social Studies
- Cumulative Impacts

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GLOSSARY

In Fula language:
bowal / bowé (sg. pl.): bauxite plateau
djolol / djoli (sg. pl.): hillside
donghol: uncultivated pocket of vegetation
hounsiré / kounsi (sg. pl.): cultivated pocket of vegetation
maoudhosaré: village chief
n'dantari / dantaji (sg. pl.): bottom land

In Landoma language:
amère: open bottom land
assamba: deep bottom land
fitarè: forest (cleared or lying fallow)
missidé: mosque
tabon: hillside

In Mandinka language:
m'bilé: "fetish priest". *m'bilé*practices are based on fetishist techniques to perform either positive actions (healing, protection, etc.) or negative ones (attacking someone else).

In Susu language:
n'duré: "fetish priest". See *m'bilé*. The Susu term is also translated in Guinean French as "magician".

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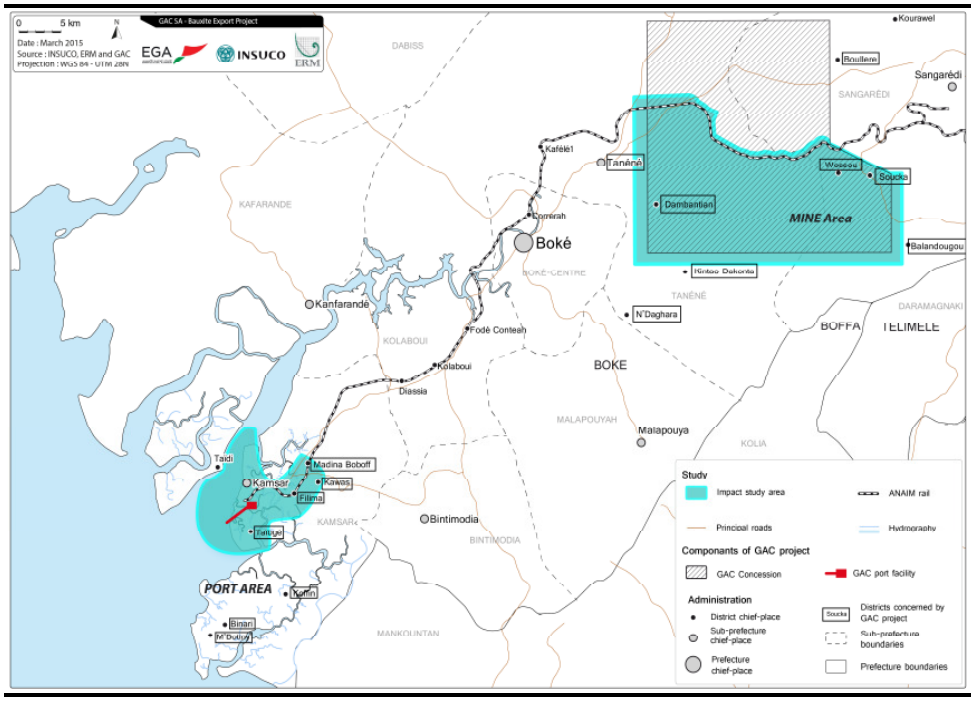
10.1 GAC PROJECT AREA

The GAC Project area extends over more than 136 km, from the mine concession area located in the vicinity of Sangarédi, to Kamsar where the port will be located. *Figure 10.1* below shows an overview of the study area split into two areas:

- The mine area is located within the mine concession area (690 km²) but only in its southern portion, over a surface of approximately 390 km². The social study area covers approximatively 490 km².

- The port area includes the town of Kamsar, the fishing villages and settlements to the south of the GAC Project area and part of the Rio Nuñez estuary.

Figure 10.1 GAC Project areas



Source: INSUCO

These two areas are within the scope of this socioeconomic baseline study. The information set out herein is derived from two different methodologies, as explained in *the Chapter 11.*

The area extending from Sangarédi to Kamsar is outside the scope of this baseline, since the rail infrastructure connecting the Project remains under the responsibility of ANAIM, with CBG as its operator. In this respect, the villages along the railway are outside the scope of any baseline studies or impact assessments.

10.2 MINE AREA

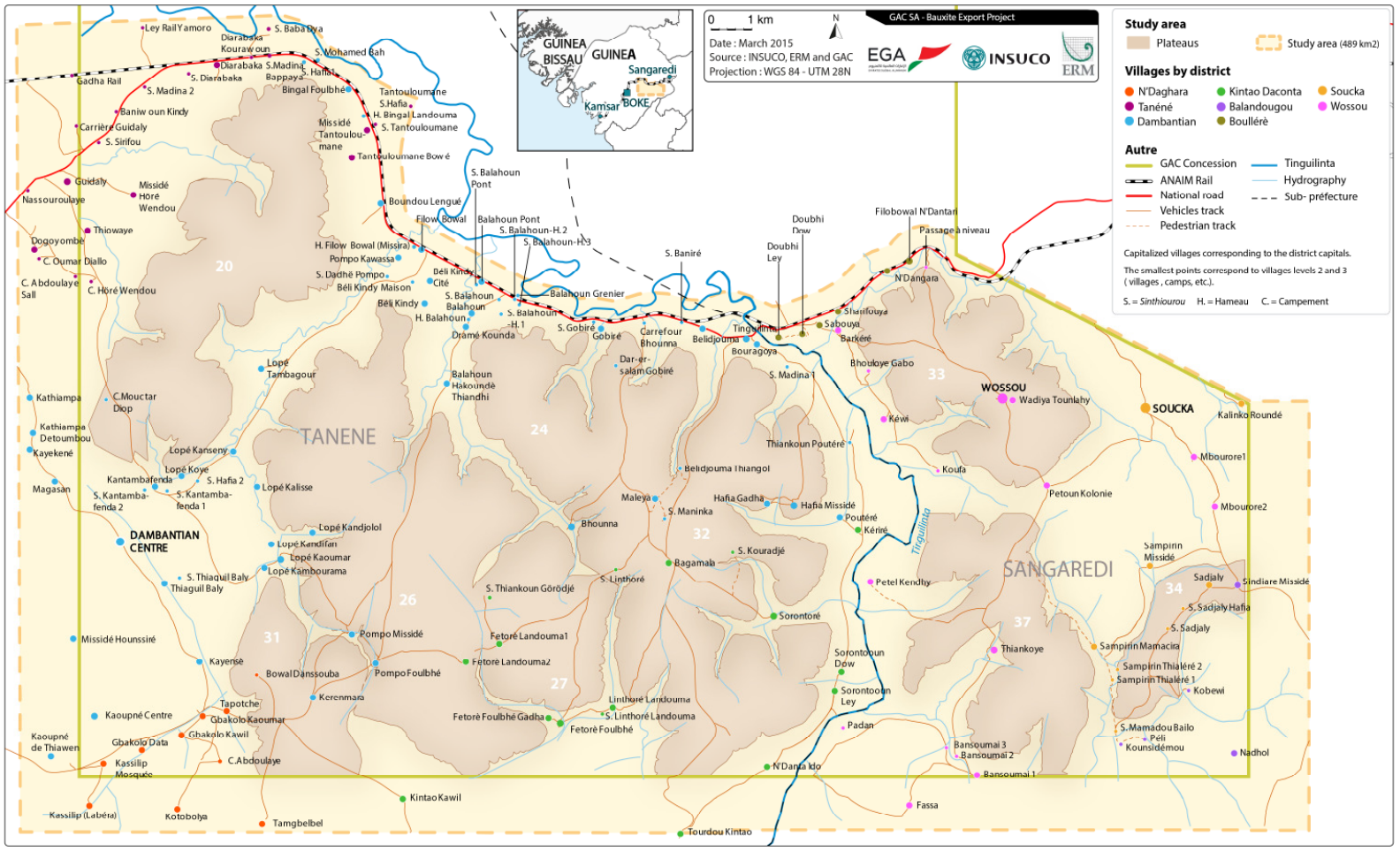
The Project in the mine area includes extraction areas, a water reservoir area located in the northern part of the concession, mine haul roads, a segment of the railway line from the mine site to the existing ANAIM railway, an offloading area, a stockpile and a crushing plant.

It extends to the Rural Communes (RCs) (corresponding to two Sub-Prefectures) of Sangarédi and Tanéné, which are physically and administratively separated by the river Tinguilinta. Both are in the Boké Prefecture (Boké administrative region).

The mine area is mostly rural but shows some demographic disparities. Population centers are separated by large unpopulated areas. A total of 155 localities (villages, hamlets and settlements) were identified, with a total of 2,605 households and 17,786 inhabitants. It should be noted that some localities are only temporary, since their inhabitants are herdsmen migrating to better pastures during the dry season.

Figure 10.2 hereinafter shows the mine area with the bauxite plateaus, surveyed localities.

Figure 10.2 Villages within the mine area



10.3 PORT AREA

The port area encompasses the town of Kamsar (especially the "Kamsar Cité" and "Kamsar Centre" districts), the surrounding villages to the south (in the Taïgbé, Binari, M'Botiny and Kouffin districts) and a portion of the Rio Nuñez estuary.

In this area, the port will be built, dredging activities will be conducted in the river Rio Nuñez, the rail spur leading to the port and a housing complex accommodating executives will be built (complex to be built within the GAC port terminal) and the base camp accommodating workers will be developed (within the footprint of the port terminal).

Figure 10.3 illustrates the footprint of the port area which comprises a terrestrial component and a marine component, given potential Project-related impacts.

Figure 10.3 Port area



Source: INSUCO

11 METHODOLOGY OF THE SOCIOECONOMIC BASELINE STUDY

11.1 MINE AREA

11.1.1 *Preamble*

This report is an assessment and summary of all the data produced as part of the socioeconomic baseline study in the mine area (hereafter the MA). Several appendices containing further information are attached to this report, namely:

- Annex 12.1: Social field team and organization;
- Annex 12.2 : Social methodological tools;
- Annex 12.3: Further information on social report data;
- Annex 12.4: An example of a Cultural Heritage datasheet; and
- Annex 12.5: Cultural Heritage datasheets (French).

The socioeconomic baseline study is structured around two distinct and complementary methodological approaches: a quantitative approach and a qualitative approach.

The quantitative approach is used to establish a socioeconomic baseline of the area with reliable and current quantified data. A thorough field survey was conducted to collect such data and local strategies were addressed through specific questionnaires called "household surveys", used on a representative sample of the population.

The qualitative approach was used at several stages of the study to understand the distinct social and cultural organizational structures in various community groups in the GAC Project area.

With the qualitative approach, the household questionnaire was refined when necessary, to include complex issues such as land tenure or agriculture which depend both on vernacular terminologies and local perceptions.

On the other hand, the qualitative approach addresses some social aspects that cannot be dealt with in the household questionnaire. It notably includes traditional land tenure, local culture, decision-making processes, village histories, centers of power, crop calendars, cultural heritage sites, etc.

11.1.2 *Quantitative surveys*

Quantitative surveys were carried out in the mine area (MA). Their main purpose was to highlight, from a statistical basis, the main features of the population and their lifestyles.

Surveyors were trained before the beginning of the survey. Training addressed the objectives of the census over its various stages, as well as standard notions associated with the collection of data of interest for the census campaign. For the household survey, training mainly focused on understanding the questions, translating them into vernacular languages and compiling the information on the form (2 trainers were mobilized in the INSUCO team). Surveyors were trained in French and local languages: depending on the languages spoken in the families, the questions could be asked in French, Fula, Landoma or Susu. Trainers spent time ensuring that in each of the languages that may be used by surveyors, the translation of the main technical terms was accurate and commonly used across the team of surveyors.

11.1.2.1 *Preamble: definition of a household*

The socioeconomic indicators detailed in this document are tools used to characterize the living conditions of households in the various areas of the GAC Project. The household is the smallest economic unit used in this socioeconomic baseline study.

The household, which is different from the family, is defined as "one or several individuals living together, partially or fully pooling their resources and recognizing the authority of a single person, the head of household". The head of household is the person who incurs his/her own expenses (food, housing, health, etc.) and takes care (either permanently or not) of other people called household members.

The household usually includes the following people:

- head of household;
- spouse(s) of the head of household;
- child(ren) of the head of household;
- ascendants of the head of household/spouse(s); and
- individuals in the custody of the household (child, adult) unable to incur most part of their expenses on their own (basic needs such as housing and food).

All the people that have been absent for more than six months and all the visitors present for less than six months were not included in the household.

11.1.2.2 *Population census*

In order to obtain reliable demographic data, an extensive census was conducted in all the locations included in the MA.
The census is an essential tool for a representative sampling of the MA. The census provides important data on populations (size, distribution by gender and age group, ethnic distribution, migration waves, etc.). Thanks to the census,

it has been possible to create a list of all the households living in the study area which has been then used to randomly select some of them to do the survey.

The census method consisted of visiting every household in the MA and compiling basic demographic data using a questionnaire. Households were also identified to take part in the later round of household surveys. All the surveyors were trained to ensure this step was carried out in a uniform fashion. The training sessions also trained surveyors to share appropriate information approved by the GAC Project team with households throughout the surveys, to enable them to answer any questions and reassure participants regarding the use of the demographic data. This is an essential aspect to strengthening data reliability and building confidence with the target populations.

The census form was purposefully kept short so as to visit each household as quickly as possible and not take too much of their time. The census was followed by the household survey. Therefore, it was not necessary to obtain a long list of information at this stage. The households selected during the sampling stage were then contacted for the household surveys. Given the high recurrence of family names, tools other than simply writing down the names of heads of household, were used. The methodology consisted in associating each household with an identification code which corresponds to the aggregation of a geographical code and household code. For larger locations, village maps, as well as a road and house codification system were developed. Through monitoring of the surveyors' progress and household code, the households making up the sample during the rounds of household surveys could be identified.

The census forms, household survey questionnaires and code chart used to fill in the survey questionnaires are attached in *Annex 12.2– Social methodological tools* of this document.

11.1.2.3 *Sampling*

The census campaign and first qualitative surveys conducted highlighted significant differences between villages in their demographic and social structure. The villages located close to the national road are significantly influenced by economic and human flows. Therefore, they grow and change at a rapid pace. Conversely, the villages far from this road have a less dynamic socio-demographic profile, economy and infrastructure.

Based on this finding, it was decided to choose geographical scales highlighting these differences in the review of socioeconomic data. The household surveys were performed so that the representativity of households was similar both along the road and in the inland area. The household sampling round was purposive and prorated.

The mine area was divided into two geographical units according to their apparent social and economic specificities. These units were divided based on the following criteria:

- the locations less than 1.5 km from the national road and thus considered as being in the road area (RA); and
- the locations more than 1.5 km from the national road and thus considered as in the inland area (IA).

As shown in *Table 11.1*, 15%of households were randomly selected for each of these two units. A sample survey of 15% permits to obtain a 95% confidence interval and an estimated error margin of 1.9% which is judged acceptable. An extra 5% of households were also selected for the two units in case some of them had to be replaced in the samples.

Table 11.1 Rational and prorated sampling

	Road Area (RA)	Inland Area (IA)	*Total*
Number of households*	1,223	1,336	*2,559*
15% of the HS*	185	201	*386*

* Excluding the households in the villages of Fassa and Nadhol
Source: INSUCO

It should be noted that the villages of Fassa and Nadhol were added after the population survey. Although these villages were part of the census, they could not be included in the household surveys. Households were not incorporated into the sampling process. As these villages are sparsely populated (46 households in total), the overall representativity of the household surveys over the area was not significantly affected.

The household surveys were carried out over a sample of 386 households, i.e. 15% of the households counted in the study area. This sample is deemed consistent enough to obtain a 95% confidence interval and an estimated error margin of 1.9%, which is judged acceptable.

11.1.2.4 *Household survey*

The questions included in the household survey form are partly standard and partly specific to the mine area so as to get a good understanding of local strategies. The questionnaire was developed from available documentations and previous surveys. Code charts were finalized following the first field qualitative surveys. The questionnaires were tested (in August 2014 with the first team and January 2015 with the second team) in Balahoun and Dawaf, two villages located outside the study area when the tests were performed[1]but close

[1] Balahoun was not part of the study area during the first stage of the socioeconomic baseline survey, in July-September 2014. The results obtained during the test surveys were not analyzed.

enough to ensure that they showed the same socioeconomic features as the villages that would be subsequently surveyed.

During the round of household surveys, the consistency of the forms was assessed in the field. The forms were reviewed upon returning from the field. The surveyors then visited again surveyed households on the following days when required. All the questions were asked in the same manner by the surveyors in order for the answers to be as accurate as possible. Some additional surveys were conducted in parallel to the household surveys so as to facilitate income calculations, namely:

- questions on the equivalences of units of measurement and prices; and
- information needed to convert local units of measurement (used in the household survey codes) into international units.

11.1.2.5 *Assessment of household incomes*

The money income of the head of household only gives a broad indication of the wealth of the household. Household wealth is significantly influenced by the size of the household therefore the household income calculated from adding the income of each individual delivers a better level of information.

Collected data were also used to calculate the number of consumption units per household, based on the Oxford index (*Oxford University, 2013*). It takes into account the number and age of each household member. The income per consumption unit hence represents a fairly representative indicator of household wealth. The reference period is twelve months. It follows the crop calendar. Non-monetary incomes were valued in Guinean Francs based on the prices of agricultural products registered in the main local market. The level of money income for a household, its economic strategies and the share of the various income items are detailed in this report.

11.1.2.6 *Other aspects taken into account in the household survey*

The other aspects included in the household surveys are demographics, migrations, health (including modern and traditional medicine as well as vaccination coverage), education, access to land, land use practices, extra-agricultural activities (fishing, hunting, employed activities, etc.), the use of natural resources, access to services, housing, domestic comfort and eating habits.

When no specific source is mentioned, all the statistics presented in this report were derived from the census or household surveys conducted by INSUCO.

The census and household survey forms are attached in *Annex 12.2 – Social methodological tools* of this report.

11.1.3 *Qualitative surveys*

The five main issues addressed by the qualitative component include:

- land tenure survey;
- historical review of villages and related authorities[1];
- identification of cultural heritage sites;
- assessment of the accessibility to the MA and mobility of households; and
- assessment of the access to basic services (health, education, etc.).

For each issue, specific attention has been paid to identifying social sensitivities and potential sources of conflicts in the mine area, to ensure sensitivity during the work carried out as part of the social impact assessment.

All the data required for the specific studies have been collected according to qualitative surveys.

At the end of each field mission, information was discussed and cross checked for consistency. These discussions led to the formulation of new assumptions that were confirmed or denied on the following days in the field.

11.1.3.1 *Land tenure survey*

People living in rural areas are not aware of the legal framework. At the local level, land management relies on customary systems. The identification of the land uses and land rights claimed by populations therefore requires a specific assessment.

The four main objectives of the land tenure survey were to:

- identify the diversity of territories and associated key-person in the decision-making process;
- identify and qualify the areas ruled under local rights;
- analyze the distribution of users and rights over these areas; and
- develop tools aiming to identify and prioritize land tenure statuses in order to develop an entitlement matrix.

As part of the land tenure survey, consultations with local populations were conducted. The questions asked related to three levels all involved in land management: lineages, villages and village groups.

The land tenure survey is a tool used to understand the relationship between populations and the space they occupy. This survey provides the elements

[1] It is essential to be fully aware of the decision-making processes and especially of key persons in the decision-making areas to understand the approaches adopted and their level of local legitimacy.

required to understand how territories are ruled, issues associated with the access to resources and power struggles among the various parties. Survey data reporting may be used as a mediation and discussion tool and was also structured in such a way as to offer tools that may be used as part of the RAP.

Figure 11.1 Discussion on land tenure in Bhounna



Source: INSUCO

11.1.3.2 *Historical review of villages and related authorities*

Some socio-cultural realities are complex: for example, the lineage power structure is closely related to the concepts a society has developed regarding the environment. Reviewing socio-cultural power structures requires a qualitative and empirical field approach to the following issues: history of migration flows and lineage settlement (founders, non-native lineages) and, genealogy of founding lineages at the village level. Based on all these aspects, the social structure in the mine area could be fully grasped.

The following tools were used:

- discussions (lineage history, distribution of administrative and institutional positions);
- genealogical investigations; and
- informal surveys with knowledgeable people identified during previous surveys.

11.1.3.3 *Identification of Cultural Heritage (CHe) sites*

Focusing on the history and sacred sites (commonly called "cultural heritage sites" or "heritage sites" by international development agencies), the identification of the Cultural Heritage (CHe) is a significant component ofany mining project.

As it is the case all over Guinea, beliefs and practices associated with CHe sites (of the animist type) have remained strong despite the spread of Islam. Fula and Landoma people in the MA acknowledge the existence of a large number of cultural heritage sites on their territory. These places are often associated with practices. They also refer to strong beliefs, passed down from generation to generation.

All the localities in the MA were visited as part of the identification of cultural heritage sites but not all the CHe sites due to their large number in the MA. A study area was specifically delineated and included the following:

- all the bauxite plateaus and areas in-between;
- a 300 m buffer zone on both sides of this specific study area; and
- at the North, because of the impacts that railway may occur, another 500 m buffer zone has been considered.

The following information was collected:

- inventory and location of the CHe sites associated with each location (identification and geolocation) except inaccessible ones, those requiring a particular sacrifice in order to enter them or those for which users firmly refused to engage with the survey team in spite of our repeated attempts (as it was the case in Kobéwi);
- identification of CHe site users, and people that have authority over them, who are also often ruling the political and religious affairs of the village (elders and representatives of founding lineages);
- preliminary individual review of the heritage value (or usage value) of each CHe site relative to its users; and
- preliminary assessment of the replicability of CHe sites (protection, relocation, replacement or destruction of artifacts and/or the entities they shelter).

CHe data are shown in French in *Annex 12.5 – Cultural Heritage Datasheets* of this report. The *Annex 12.4 - An example of cultural heritage datasheet* provides one of them in English.

11.1.3.4 *Assessment of the accessibility to the MA and mobility of households*

Assessing the accessibility to the MA and the mobility of households aims to understand household movement strategies: why do they move? Where do they go and how?

Through the surveys carried out (household and qualitative surveys),a great deal of information could be obtained on the means of transport used by households and main destinations associated with education, health, etc.

It was then complemented with further field data and surveys, namely:

- assessment of the accessibility to the locations by car and depending on the season;
- assessment of traffic flows on the national road depending on the type of vehicle, day of the week (market day or not) and season; and
- assessment on how public transports work at the level of the taxi drivers association.

Assessment of the access to basic services

A further survey targeted the basic infrastructures available in the MA: water supply points, healthcare and education facilities, etc. The infrastructures were identified and geotagged. Discussions with facility managers, public authorities and/or village representatives were also conducted to understand how such infrastructures are operated and how local populations may have access to them.

The markets in Tinguilinta, Linguiré and Sangarédi were visited in July 2014 to determine staple food prices. Such data are essential when reviewing the household surveys (especially to calculate the income deriving from agricultural activities).

Thanks to GAC SA, which monthly monitors prices on the Tinguilinta and Sangarédi markets, it was also possible to analyze trends in market prices between 2011 and 2014, especially for rice and groundnut, two key products in the economic strategies of households.

11.1.3.5 *Performance indicators*

The socioeconomic indicators selected for this study were used to estimate likely living standards[1] and living conditions[1] of the households in the study area 10 years after the installation of the Project.

[1] Living standards refer to the quality and quantity of goods and services a household can afford. In other words, it refers to household assets or wealth.

In this report, some twenty key indicators were used. They are both "quantitative" and "qualitative" (in the latter case, views of the heads of households or aggregations of indicators thus using subjective notions).

Through the monitoring of these indicators, Project impacts on the living conditions of neighboring communities will be assessed.

11.1.3.6 *Consultations*

The objective is to comply with IFC Performance Standard 1 (2012) which states the importance of engaging the populations living in the Project Area.
The engagement process initiated in the framework of the Stakeholder Engagement Plan (SEP) was continued as part of the socioeconomic baseline study.

The IFC recommends systematic stakeholder engagement throughout the Project. When performing a socioeconomic baseline study, it is all the more essential since target communities are those on which experts and surveyors have to rely so as to better understand the living standards and socioeconomic dynamics on the territory under review.

When conducting the study, all the stakeholders and more specifically the populations in the 155 locations within the study area were widely sensitized to the SEIA activities to ensure:

- easier access to the territory and information/data;
- as much information as possible could be gathered within a relatively short timeframe (2 months); and
- one or several internal endorsements could be obtained from the relevant populations based on the information gathered and analyses provided by experts.

A total of some 1,100 individuals were directly engaged in the development of this study, through one-on-one interviews and/or focus groups.

11.2 PORT AREA

11.2.1 *Bibliographic and desktop review in Kamsar*

The port area includes many mining infrastructures, the main ones owned by CBG, which has been in the area for some forty years. Similarly, Kamsar, which

[1] The assessment of living standards focuses on the fulfillment of basic needs: food, healthcare, education, movements, housing, etc. This approach corresponds in a way to a more qualitative vision of the level of human development *or wellbeing*.

is a large urban center, is home to many national and international associations and NGOs. In this respect, many environmental and socioeconomic assessments have been conducted over time. The existing literature (including SNC-Lavalin's SEIA realized between 2004 and 2006 and completed by Knight Piésold in 2008) was used as a document base providing a wealth of information. All the studies reviewed are referenced in the general bibliography of this study. Besides, this bibliographic review was complemented by the review and interpretation of satellite images of the area.

SNC-Lavalin's studies between 2004 and 2006 and collated by Knight Piésold were part of the authorization already provided for port activities (platform, dredging, etc.) and were reviewed as part of the SEIA update.

Box 11.1 Summary of the methodology used

The socioeconomic baseline study in the mine area is structured around two distinct and complementary methodological approaches:

- A quantitative approach consisting in collecting reliable quantified data on demographics and household strategies. In this respect, household surveys were carried-out with a sample representing 15% of the households in the area to reach a 95% confidence interval and a minor error margin, estimated here to be of 1.9%; and
- A qualitative approach to refine the household survey topics, particularly around agriculture, land tenure, governance, cultural heritage, etc.

Information on the port area is derived from the review of the existing literature, and the interpretation of satellite images.

12 SOCIAL BASELINE STUDY - MINE AREA

12.1 POPULATION AND DEMOGRAPHICS

12.1.1 *Summary of the population history in the mine area*

The mine area (MA) is split by the river Tinguilinta which acts as a natural border between two territories. To the west, the Landoma people are recognized as the "natives" of the area since they have been present for several centuries. To the east, the Fula people settled in the area under the Theocratic State of the Fouta Djallon (in the early 18th century). Both Landoma and Fula people were associated to a greater or lesser degree in all the events in the area: trade, conquests and proselytism.

Wossou was founded with a triple objective from the Fula theocracy: colonizing the territories and societies living to the west toward the coastline, controlling trade routes leading to trading centers (Boké) and the areas where the Europeans are settled and islamizing the region. When Wossou was founded, the MA was virtually unpopulated, with only a few migrants of varied identities (mainly Mande du Gabou, Djallonké and Susu) and some Poulis (non-islamized Fula *bowé* farmers) crossing the area but not settling there.

Once Wossou was founded, the eastern part of the MA became increasingly populated. In addition to the castes of free and noble men and intellectuals from Wossou and some additional small locations, villages of captives with a varying status depending on their origin and settlement conditions, were added. The Bah and other Fula clans from upper classes were the masters in all respects: customary, land, religious, economic and work power. Until the beginning of the colonization, the social order prevailing in the eastern part of the MA was strongly organized into a hierarchy and pro-slavery.

In the western part of the MA, the Landoma, who are traditional fetish priests, have long avoided being Islamized. Few live in the area and those who do have settled in deep bottom valleys and remote places.

At the time of the colonization (in the late 19th century), trade activities were on the decline as the Fula social order was endangered by the colonial policy. Traffic on the roads connecting the Fouta to Boké through the MA was light. The large market towns that used to be trading hubs were increasingly abandoned. People repopulated the countryside in search of croplands.

At that time, Wossou maintained control over a large number of locations to the east of the river Tinguilinta. However, pro-slavery behaviors were increasingly marginalized, leading to the increase in land claims by former slaves under the first then second Republic. For example, thanks to the ties forged with other locations, Soucka became a decision-making power to the detriment of Wossou.

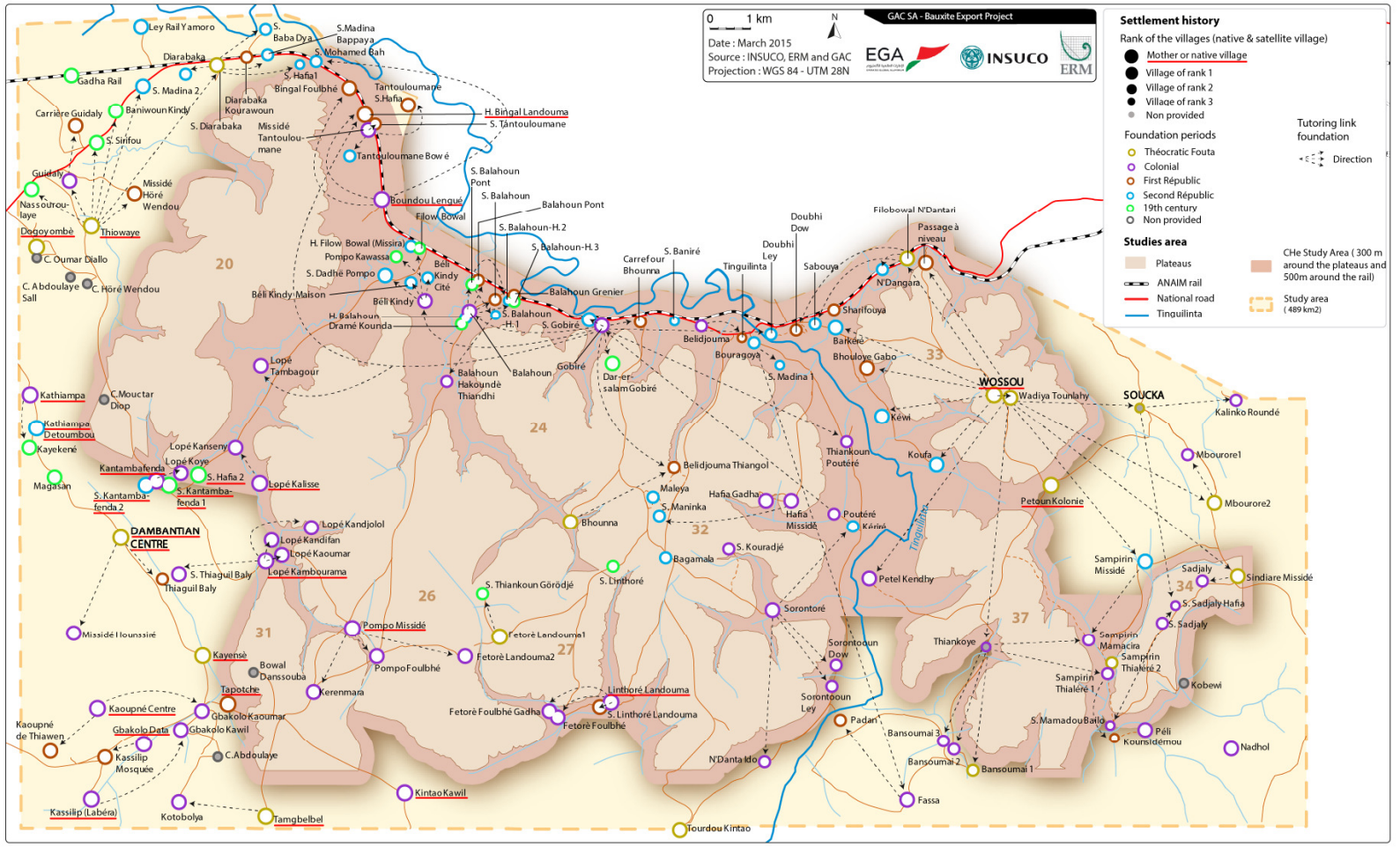
Many locations took advantage of these changes to break away from the authority of their former ruler.

At the same time, the Landoma people settled to the west of the river Tinguilinta. They were quickly joined by a large number of former captives from the eastern area in search of land and willing to assert their independence from Wossou. To this day, the area to the west of the river Tinguilinta has been considered by them as a host territory characterized by an egalitarian Landoma policy. The Fula language has become the common language. A distinctive and unifying "Fulanisation" occurred, notably around Islam. Many captives dropped their former Koulibaly or Kante names to Barry or Diallo.

With the development of Sangarédi (around 1960-1970), population dynamics became more pronounced across the MA and resulted in a social, economic, political and land standardization on both sides of the river Tinguilinta.

Figure 12.1 summarizes the population history and hierarchical structure in the MA, which help understand a fraction of current social relations in the MA, as addressed in this report.

Figure 12.1 Population history in the mine area



Source: INSUCO

12.1.2 *Spatial distribution of the population in the area*

12.1.2.1 *Population centers in the study area*

The comprehensive population census conducted in the 155 locations within the MA, identified a total of 17,786 individuals. The average population density is 36.4 inhab./km² which is below the national average (45.4 inhabitants/km² in 2013). However it conceals significant spatial disparities.

The locations within 1.5 km on both sides of the national road contain nearly half the population of the whole MA. In this area, the density is 115.5 inhabitants/km², i.e. 5 times as much as in the inland area (23.2 inhabitants/km²). This gap may be explained by the influence of the road in terms of spatial dynamics. Trade and migration flows resulted in the economic and demographic development of the area. The roadside area has been experiencing the beginning of the urbanization process. It includes the main population centers of the MA: Tinguilinta (1,054 inhabitants), Boundou Lengué (947 inhabitants) and Barkéré (524 inhabitants).

A single other location, Soucka, in the inland area, is also considered as a major population center with 627 inhabitants. Its growth may be explained both by its administrative status (District capital) and the strategic ties built with other locations such as Boullérè.

The remaining locations in the MA are of a small size: 52 of them count between 101 and 500 inhabitants and 94 have less than 100 inhabitants.

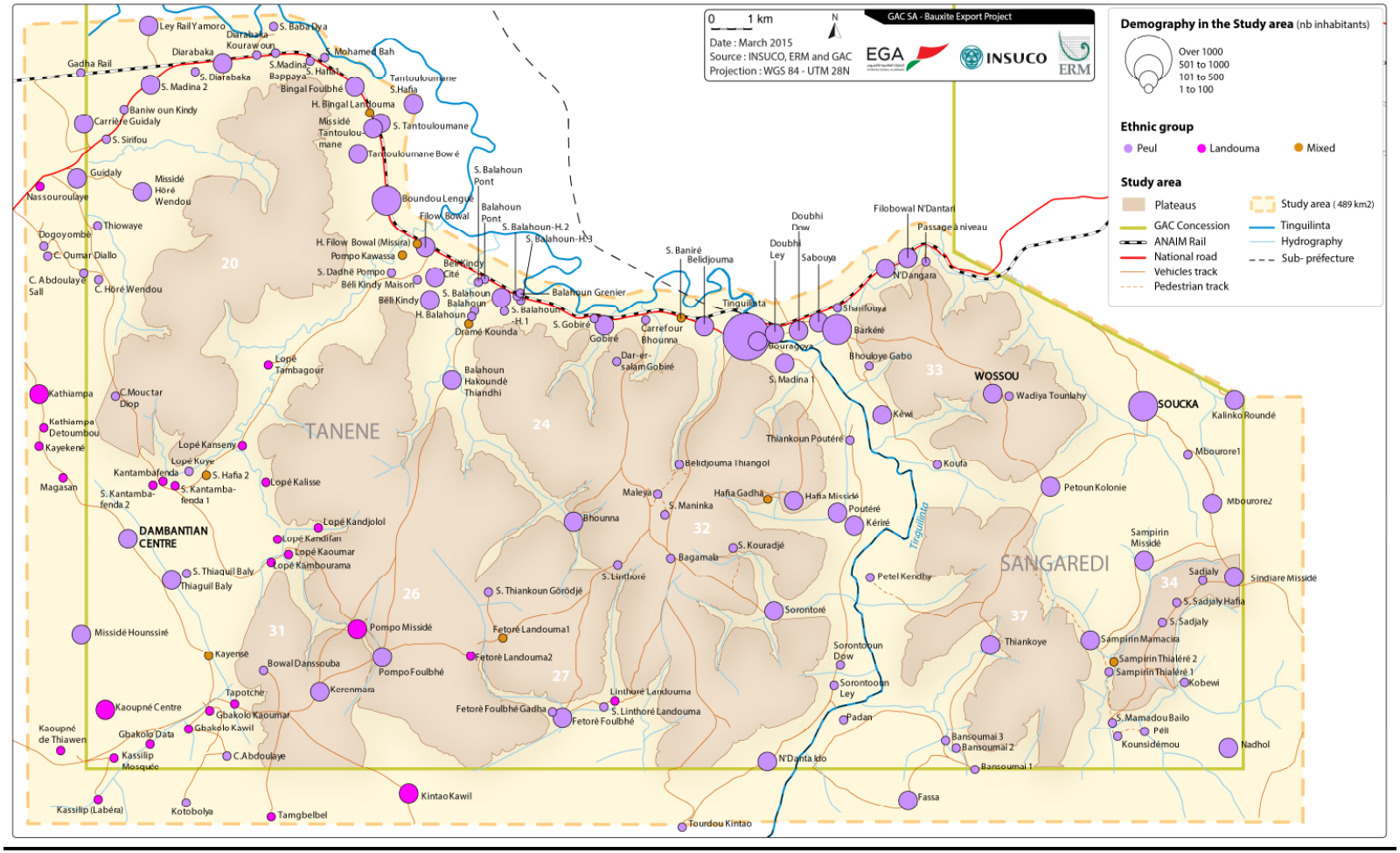
Two significant aspects need to be taken into consideration to properly understand population data:

- Since local representatives wished so, the census in the locations of S.Gobiré and Dar-er-Salam Gobiré was carried out at the same time as in Gobiré, although they are in distinct locations.

- The locations of Bowal Danssouba, C.Aboudlaye and C.Mouctar Diopwere completely vacated between the scoping phase and the socioeconomic baseline studyas these are essentially temporary settlements. Their inhabitants are herdsmen who travel to better pastures during the dry season. Since these locations exist more than half of the year, it was decided to keep them in the database.

Figure 12.2 below shows all the population centers in the MA.

Figure 12.2 Spatial distribution of the population in the MA



Based on the general population census of 1996 (*Recensement Général de la Population et de l'Habitat -RGPH*)[1], the population in the MA reportedly increased by a factor of 2.1 within 18 years, i.e. a 4% average annual growth. Such figures are provided as a reference only and should be carefully used for two main reasons:

- The RGPH census did not clearly define the methods used for data collection, selection of locations (geographical limits, gathering of several entities ruled by a single one, etc.) or even the specific features of a household.

- The 155 locations under review here were identified as part of a scoping mission conducted by INSUCO. To facilitate field works, some locations that reportedly belong to a single village, but are geographically distant (e.g.: Doubhy Ley and Doubhy Dow), were split.

Population growth in the MA is uneven. It is significantly higher along the road (approximately 7% per year) than in the Inland Area (approximately 3%).

The village of Tinguilinta which was not part of the 1996 census, most probably because it was deemed too small and united to another village, is now the most populated in the area. It can easily be imagined that its average annual growth has boomed (potentially over 20%, which is the average rate observed near mining areas in Guinea) since2004, notably when GAC SA arrived in the area.

Population growth in the MA may be partially attributed to a still high natural increase but it is mainly accounted for by a net increase in migrations, especially to roadside locations. That is why migration flows will be addressed at the level of the MA and based on the Road Area (RA)/Inland Area (IA) dichotomy.

12.1.2.2 *Migration flows in the mine area*

In order to understand the migration trend in the MA, the origin and settlement date of households were reviewed.

Three types of households were taken into consideration:

- **Native households** who have always lived in the location. These households may have an ascendant who was already living in the location prior to 1973

[1]*Few reliable demographic data are available from the Guinean public authorities. The latest statistics publicly made available are the 1996 population census (*Recensement Général de la Population de l'Habitat (RGPH*) and the 2005 population and health survey (*Enquête Démographique et de Santé - EDS*). A new census was carried out nationwide in 2014. Results at the village level are still to be made public.*

or who settled after 1973[1]. In the latter case, native households may be considered as second generation migrants.

- **Returning natives** who settled while their ascendant was already living there prior to 1973. These people often have an influence on the decision-making process in the town/village due to their experience.

- **Migrant households** who settled in locations where their ascendants never lived.

At the level of the MA, approximately 65% of heads of households have always lived in their location. Among them, less than 1.6% are second generation migrants. In other words, the heads of households who have always lived in their location also had their ascendants coming from the same location. The population may be considered as sedentary.

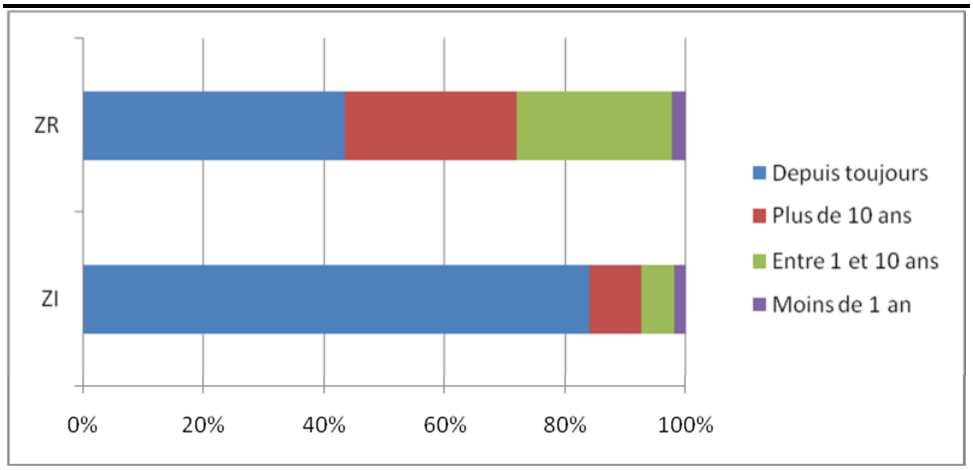
Conversely, 31.4% of households are migrants with no direct ties in the location, since their ascendants never lived there.

Finally, 3.7% of households are returning natives. More than half of them are young heads of households whose fathers settled after 1973. These heads of households most likely left to study in town or look for a job where opportunities were more plentiful.

At a local level and as shown in *Figure 12*.3 below, migration dynamics dramatically differ. In the Inland Area (IA), 84% of the population is natives. Close to the Road Area (RA) over 56.6% of the population are migrants or returning natives. Twenty-eight percent of them settled after 2004 ("1 to 10 years ago"), i.e. since the arrival of GAC SA. These rates confirm the recent but significant annual population growth in the locations such as Tinguilinta or a little further away, Boundou Lengué.

[1]This date corresponds to the arrival of CBG, the first mining company in the area.

Figure 12.3 ***Date when heads of households settled in the Road Area (RA- Zone Route ZR) and Inland Area (IA- Zone Intérieure ZI)***

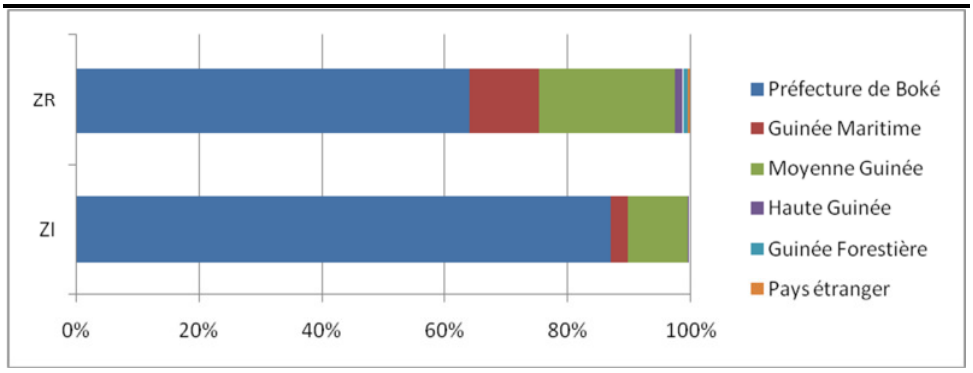


Depuis toujours: always/ *Plus de 10 ans*: more than 10 years / *Entre 1 et 10 ans*: between 1 and 10 years / *Moins de 1 an:* less than 1 year

Source: INSUCO

Across the MA, and as shown on *Figure 12*.4, 76.3% of migrations are local, i.e. they take place between locations within the Boké Prefecture. Only the locations close to the road and which natural growth is due to the presence of GAC SA host more diverse populations, as it is the case in Tinguilinta and Boundou Lengué which host approximately 40% of households not from the Boké Prefecture. However, they come from the region or the neighboring ones (Middle Guinea) with which historic and cultural ties are strong.

Figure 12.4 ***Origin of the heads of household fathers in the Road Area (RA) and Inland Area (IA)***



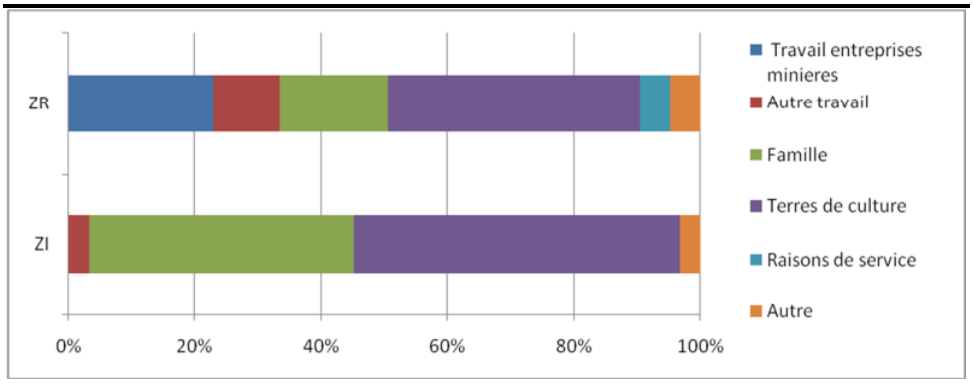
Préfecture de Boké: Boké Prefecture / *Guinée Maritime*: Maritime Guinea / *Moyenne Guinée :* Middle Guinea / *Haute Guinée* : Upper Guinea / *Guinée Forestière* : Guinea Forest Region / *Pays étranger* : foreign country

Source: INSUCO

The study area is attractive for two main reasons:

- many households hope to find job opportunities associated with the presence of GAC (and other mining companies). As a result, 22.9% of households in the RA settled there for this reason; and
- also, 40% of migrants in the IA settled to have access to agricultural land.

Figure 12.5 Reasons why heads of households settled in the Road Area (RA) and Inland Area (IA)



Travail entreprises minières: work in mining companies / *Autre travail*: other work / *Famille*: family / *Terres de culture*: agricultural land / *Raisons de servic*e: operational reasons / *Autre*: other

Source: INSUCO

12.1.3 *Socio-demographic profile of the mine area*

The socio-demographic profile of these populations may be used to assess urbanization-induced structural changes and anticipate human development issues.

Some data usually used in the assessment of population structures are not collected at the local scale, especially in rural areas, either through quantitative or qualitative surveys. For example, it is the case for birth rate, mortality rate and life expectancy. In this respect, some national data are summarized in *Table 12.1*.

Table 12.1 Summary of national population data for 2014

Data	
Inhabitants	*11,474,383*
Average number of individuals/household	*6.8*
Birth rate	*36.02%*
Mortality rate	*9.69%*
Life expectancy	*59.6 years*
Average number of children per woman	*5.8 (in rural areas)*
Population under 15	*42%*

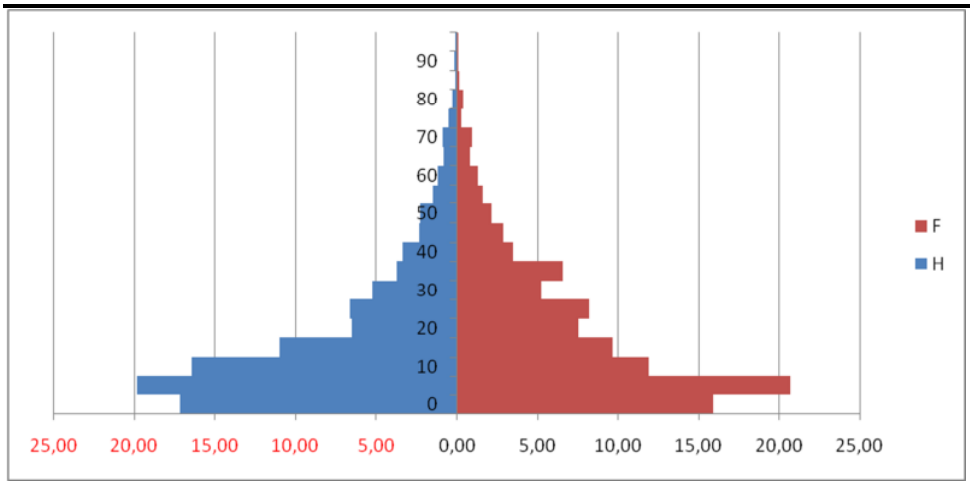
Source: Statistiques-mondiales http://www.statistiques-mondiales.com, consulted in August 2014 and February 2015.

12.1.3.1 *A demographic profile mirroring the national trends*

The assessment of the population structure in the MA reveals that it is no exception and mirrors the national trends:

- the gender distribution is balanced with 51% males and 49% females; and
- the population is young: 45.6% is under 15.

Figure 12.6 Population pyramid for the mine area (in %)



F: female / H: male

Source: INSUCO

The population pyramid for the mine area (MA) confirms these trends. It also highlights the "generation gaps" that may exist between age groups and genders. Although children are numerous, those under 5 are less represented than those aged 5 to 10. Population isolation and the lack of access to healthcare facilities result in high infant mortality. Likewise, people over 65 are few and life expectancy is short.

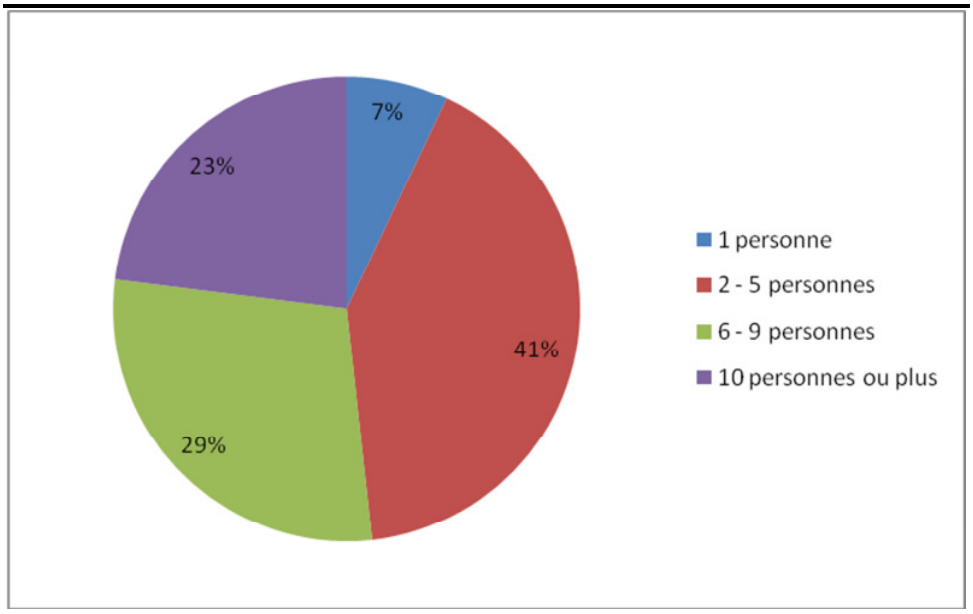
The dependency ratio is the ratio of individuals that are supposed to "depend" on others in their daily lives, typically the young (under 15) and the elderly people (over 65),and the number of individuals able to bear the burden. In the MA, this ratio is 1.9 which is generally considered quite high. This is due to the number of inhabitantsunder the age of 15. Adults are underrepresented compared with the rest of the population. This ratio should however be carefully used in an area where individuals are economically productive before they turn 15.

The population pyramid also points out that males between 20 and 40 years old are underrepresented compared with females of the same age. Men who are in the working age, migrate more easily outside the MA to find economic opportunities. Conversely, women are sedentary; they remain in the village to

carry out all the agricultural activities and take care of the other members of the household.

In rural areas, the size of households mirrors the power of the patriarchal system where the social organization relies on the extended family and headed by an older member, the head of household. 88.9% of households in the MA are headed by men who are on average aged 41. Besides, households include 7 individuals on average, which is again very close to the national level (6.8).

Figure 12.7 Household size



1 personne: 1 person / *2-5 personnes:* 2-5 persons / *6-9 personnes :* 6-9 persons /*10 personnes ou plus:* 10 persons or more

Source: INSUCO

As shown in *Figure 12.7*, 23% of households include more than 10 members. These are essentially polygamous households where co-wives and their own children are all under the authority of the father. According to the household surveys, polygamy is practiced by a little more than a third of households in the MA (against nearly 43% in the IA), with 2.9wives on average per polygamous head of household. It should be noted that as anywhere else in Guinea, polygamy increases with age (half of men over 50 are polygamous) and there are few interethnic marriages, i.e. between two individuals of a different ethnic origin (only 2.4%).

The demographic structure of households (size and polygamy) is closely related to the cultural practices of the populations, whether religious, ethnic or even influenced by "modernity" (*Bidou and Touré, 2002*).

12.1.3.2 *A demographic profile which confirms the gap between the road area and inland area*

12.1.3.3 *A more thorough analysis of demographic data confirms the dichotomy existing in terms of population, between the area close to the road and the inland area. Although urbanization results in the concentration of populations, it also induces significant changes in the population structure itself.*

Although still in minor proportions, gender distribution is different with 52.2% males and 47.8% females in all the locations within 1.5 km from the road whereas it is respectively 50% males and 50% females in inland locations. There are also twice as many singleton households (one individual per household) along the road (8.9%).

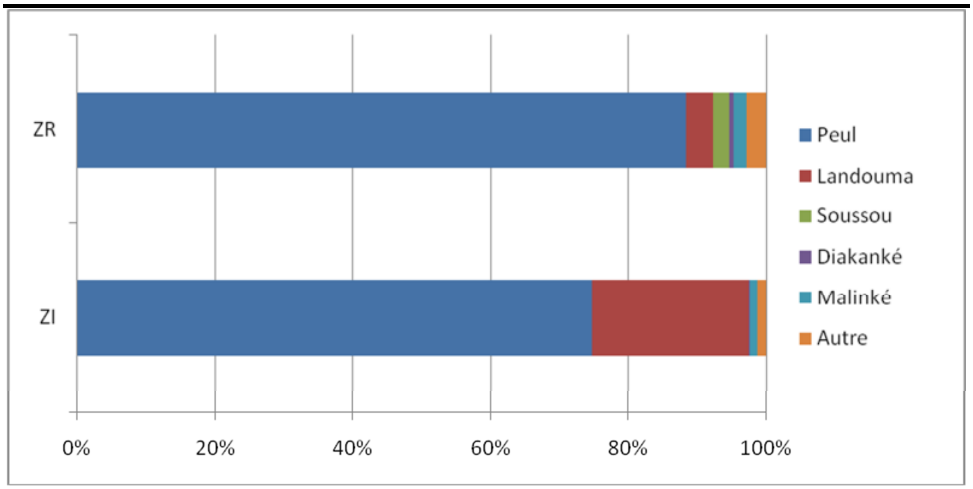
Both trends are correlated. Men migrate alone in the hope of finding a job or other indirect job opportunities. The rest of the family may only reunite with them once the economic situation of the household has stabilized.

Although the average size of households remains similar between the RA (6.6 individuals) and the IA (7 individuals), these households are mainly extended families in the RA. Households accommodate outside members (relatives or not) in order for them to have an easier access to basic services, especially education and health. According to the household surveys, 28.1% of households in the RA have children under their custody (against19.9%in the IA).

Furthermore, migrations over the past few years have highlighted the increasing existence of ethnic diversity in the area close to the road. As shown in *Figure 12.8*, approximately 8% of the population in the RA belongs to ethnic groups not historically native of the area. As a result, Susu, Diakanté, Bambara, Guerzé, Kissi, etc. (gathered in the "Others" category) are encountered. A total of 14ethnic groups are present in the area close to the road. However, Fula people or related people remain the largest ethnic group (88.5%).

Conversely, the IA is homogeneous. It is populated with groups historically native of the area, i.e. Fula and Landoma people (see *Section 12.1.1*).

Figure 12.8 Ethnic distribution in the Road Area (MA) and Inland Area (IA)



Peul: Fula / Landouma: Landoma / *Autre:* other

Source: INSUCO

In rural localities, the different ethnic groups tend to gather by concession, location or area, in such a way that it is more a matter of cohabitation than actual socio-spatial mixing (the different ethnic groups live together in the same locality but they generally gather in different neighborhoods).

The concentration of populations over a same territory alters the socio-demographic structure of the population. It also induces the evolution of their social practices and economic strategies. The assessment of the socio-economic conditions in the area (see *Section 12.2 and following*) is therefore presented based on this "Road Area"(RA)/"Inland Area" (IA) dichotomy.

Vulnerable groups of people identified in the Mine Area include children, single women acting as household heads, the elderly, and people in poor health.

Box 12.1 Summary of the population and demographics in the MA

The mine area includes 155 locations and 17,786 inhabitants. The average density is 36.4 inhabitants/km²and annual growth rate is estimated to be 4%.

There are however significant socio-demographic disparities between the area along the road and the inland area. The main population centers are located along the road: Tinguilinta (1,054), Boundou Lengué (947) and Barkéré (524).

These differences may be accounted for by significant migration trends along the road. Trading and the presence of the GAC Project base in the surrounds of Tinguilinta, attract many people looking for new economic opportunities. As a result, 56.6% of the population along the road are migrants and among them, 28% have been there for less than 10 years (since 2004).

The socio-demographic profile of the mine area mirrors the national trends:

- households include approximately 7 individuals;
- the population is young: 45.6% is under 15; and
- there is a greater number of men: 51%.

The mine area is mainly populated with Fula and Landoma people.

12.2 SOCIAL BACKGROUND AND ACCESS TO BASIC SERVICES

12.2.1 *Accessibility and mobility*

12.2.1.1 *Levels of accessibility to the MA*

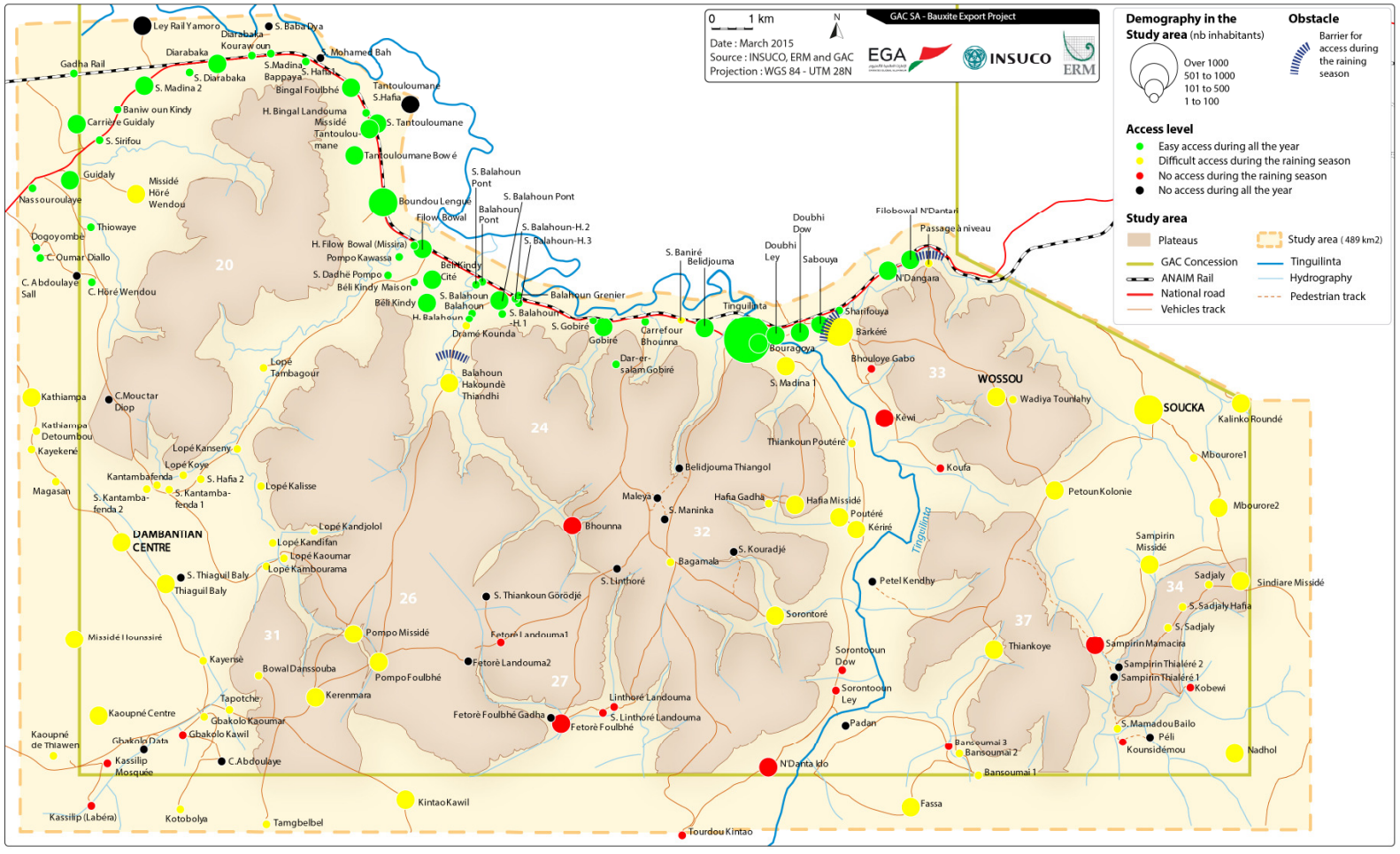
Accessibility is defined as the varying degrees of ease with which a location can be reached. In the MA, it mainly depends on:

- the presence of asphalt roads and tracks suitable for vehicles;
- the passability of roads and tracks, including during the rainy season; and
- the distance to towns/villages from these roads and tracks.

The MA is crossed to the north by a single asphalt road which is a national road. The remainder of the MA includes tracks which quality and hence passability may greatly vary. *Figure 12.9* below shows all the roads and tracks in the MA in 2014[1] as well as village accessibility by car.

[1] *At the time of the baseline study, EGA was delineating new roads to access exploration sites. Since they were only used by EGA vehicles, they were not referenced in the present study.*

Figure 12.9 Level of accessibility to the MA by car (in 2014)



In the RA, nearly all the villages are easily accessible all year round. Only six villages are deemed hard to reach during the rainy season. Because of the river flowing between Barkéré and the village named "Passage à niveau", the road is impossible to cross during the rainy season. One currently has to make a detour via Soucka and Wossou to reach these villages. There is no road suitable for vehicles from the national road to the four villages located to the north of the railway.

In the IA, only 2 villages are easily accessible all year round by car. The uneven surface, the presence of many watercourses to cross and ground quality makes the tracks hardly passable during the rainy season. Nineteen villages thus become inaccessible during the rainy season. It should be noted that given the lack of tracks suitable for vehicles, 18 villages are inaccessible all year round.

Figure 12.10 Way to access the village of Sampirin Mamacira during the rainy season



Source: INSUCO

The levels of accessibility to the MA is not enough to understand the moving strategies of the populations which also depend on the mobility level of households, i.e. their ability to mobilize a motor vehicle.

Households with limited mobility and living in a remote location tend to restrict their movements to the fulfillment of basic needs (health, education, etc.). These movements are commonly on foot and at a micro-scale, i.e. between neighboring villages. Households will cover greater distances on market days only (Saturdays in Tinguilinta).

Conversely, households who live along the road and have the financial resources to mobilize a vehicle move more freely all year round. The purposes

of such movements are also more varied: fulfillment of basic needs, visits to relatives/friends, diversification of activities, etc.

12.2.1.2 *Household means of transport*

In the MA, over three quarters of households have no private means of transport. Households in the RA are better equipped. Accessibility to the area encourages them to move and hence to invest in a vehicle. It is estimated that 23.8% of households own a motorcycle and 2.7% own a car.

In the IA, only 14.9% own a motorcycles and 1% own a car. Access problems (remoteness of centers, many tracks impossible to pass during the rainy season) and costs associated with owning a motor vehicle do not encourage households to invest accordingly. By contrast, 18.4% of households own a bicycle in order to cover short distances.

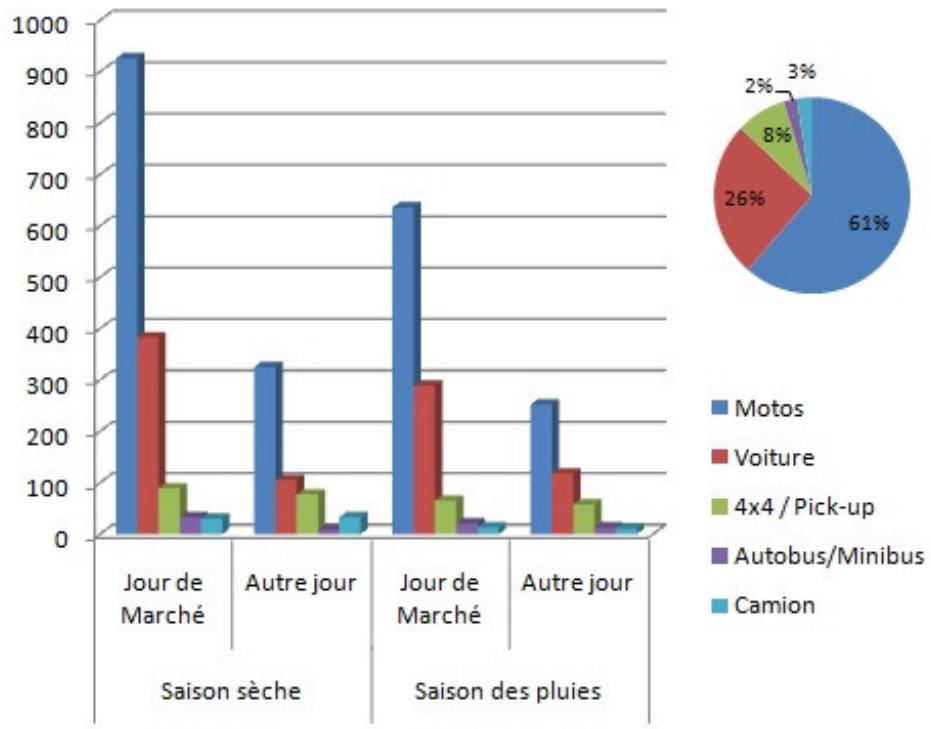
It should be noted here that approximately 10% of households in the MA rent out their motorcycles several days a year to earn some extra income.

12.2.1.3 *Traffic on the national road*

Traffic on the national road is not heavy. Average traffic rate is 20 vehicles per hour, of which 61% are motorcycles and 34% cars and 4x4 vehicles/pick-up trucks. *Figure 12.11* below shows the different traffic rates depending on the season and day of the week (including on Saturday, which is market day in Tinguilinta)[1].

[1]As a reminder, the data shown herein are estimates calculated over 2 days during the dry season and 2 days during the rainy season.Yet, traffic on a national road depends on a certain number of exogenous factors (climate, social and/or political events, activities, etc.). In order to measure traffic on the national road more accurately, it would be necessary to perform field measurements on a more regular basis.

Figure 12.11 Traffic on the national road



Motos: motorbikes / *Voitures:* cars /*Camion:* Truck / *Jour de Marché:* market day / *Autre jour:* other day / *Saison sèche:* dry season / *Saison des pluies:* wet season

The market day is that of Tinguilinta, i.e. on Saturday
Source: INSUCO

Traffic on the national road is generally heavier during the dry season than during the rainy season. Accessibility to the road and traffic conditions are easier, especially for the populations living in the IA. The rainy season also coincides with peaks in farming activities. Populations are busy in the fields and their movements correspond almost solely to the fulfillment of basic needs.

In addition, traffic on the national road is twice as heavy on market days compared with the rest of the week, regardless of the season. Most vehicles come from and go back to Sangarédi. People come to buy products that are cheaper than in Sangarédi, and retailers sell their goods on the second largest market in the area. However, the populations living to the west of Tinguilinta tend to favor the Boké market which is larger than that of Tinguilinta.

Assessments of traffic flows also revealed the following:

- nearly two thirds of 4x4s or pick-up trucks belong to private companies; and
- 75% of cars are shared taxis transporting both people and goods.

12.2.1.4 *Private means of transport*

Auto-taxis in Tinguilinta have been organized into a union since 2010. The union has three main missions: meeting users' needs, controlling the supply of private transport at the local level and finally regulating and defending taxi drivers' interests with the authorities. In this respect, the union has to pay a monthly fee of 200,000 GNF to the RC of Tanéné. Each vehicle pays a ticket to the union when leaving. The price ranges from 2,000 GNF to 3,000 GNF depending on the seating capacity of the taxi. Destinations and prices are shown in *Table 12.2*.

Table 12.2 Destination of auto-taxis

Destination	*Price (GNF)*	Average number of daily departures
Tinguilinta - Boké	*10,000*	3
Tinguilinta - Sangarédi	*8,000*	3
Tinguilinta - Kolaboui	*16,500*	2
Tinguilinta - Kamsar	*22,000*	2
Tinguilinta - Conakry	*90,000*	1

Source: *Syndicat des Taxis-Autos*

Many auto-taxis are old and poorly maintained. Safety is not systematically ensured. More or less serious accidents are quite common, even though it is hard to give a figure without any official statistics.

Figure 12.12 Shared taxi in Tinguilinta



Source: INSUCO

In addition to auto-taxis, there are two categories of motorcycle taxis in the MA:

- Professionals who are not organized into a specific structure. Their number, pick-up points and prices may therefore vary significantly based on demand and destinations.

- Individuals who occasionally transport people (e.g. on market days) for money.

Motorcycle taxis can go everywhere across the MA. Although they are not widespread within the MA, they significantly improve the mobility of the most isolated households.

12.2.2 *Housing and comfort*

12.2.2.1 *Land tenure status*

Housing is often the main expenditure for households. Most heads of households in the MA, 80.5% in the RA and 95.9% in the IA, are considered as the owners[1] of their houses[2].

Households usually become owners through an inheritance or donation. Property commercialization is a recent trend only observed in a limited number of locations, mainly in the RA, such as in Tinguilinta, Belidjouma or Diarabaka Kourawoun. As a result, 28.2% of owners in the RA have bought their homes through a financial transaction (against 2.1% in the IA).

It should also be noted that in the RA, 7% of households rent their accommodation and 10.8%are accommodated free of charge. Two explanations are plausible. These households settled temporarily in order to assess potential economic opportunities in the area, or they are not from the area and since they could not buy a house, they had to find another solution.

12.2.2.2 *Housing quality*

There is a significant architecture diversification in the MA, resulting from the cultural influences which characterize the area and a certain standardization toward urban-type architecture within the RA. Hence, the following structures can be seen:

- Fula-style houses to the east of the river Tinguilinta: round-shaped and surrounded by a small terrace, sometimes decorated with paintings;

[1] Ownership is considered here as "a property belonging to somebody who may exclusively use it". Such notion does not imply that this property is registered and managed under the legal framework, as it will be explained in the section on land tenure.

[2] Only housing is considered here, croplands are excluded.

- Landoma-style houses to the west of the river Tinguilinta: square-shaped, with a thatched roof and often decorated with paintings; and
- "Modern" roadside houses: square-shaped, built with bricks, metal roofing and coated walls.

Figure 12.13 Fula and Fula and Landoma style houses



Source: INSUCO

Houses built using traditional materials account for 97.4% of houses in the IA and 89.2% in the RA. The beginning of the urbanization process in the RA is indeed combined with the improvement of living conditions and durability of houses which are increasingly semi-hard standing (earth blocks and cement joints, baked or stabilized bricks) or hard-standing (cement blocks, breeze blocks, cement coating). By contrast, there are nearly as many houses with metal roofing in the RA as in the IA.

12.2.3 *Education*

12.2.3.1 *Guinean education system*

All the public schools in Guinea (except for higher education) are ruled under the principle of universal access: "free school for all".

Education is divided into three main cycles:

- five year primary education (from 1st to 6th grade) ending with an exam to obtain a primary school certificate (*Certificat d'Etudes Primaires - CEP*);
- secondary education with 4years in secondary school (from 7th to 10th grade) ending with an exam to obtain a first cycle certificate (*Brevet d'Etudes du Premier Cycle - BEPC*) followed by 3 years in high school (from 11th grade to final year) ending with the final exam (*Baccalauréat*); and
- higher education.

Government policies adopted over the past decades have focused on access to primary education. Although the financial contribution of the State has remained minor, the net enrolment rate for primary education has continuously

increased (83.5% of children enrolled over the 2008-2012 period) (*UNICEF, 2012*).

Such results may be due to the mobilization of many financial partners (NGOs, private companies, etc.), the increase in the number of private schools and increasing community involvement through school parents and friends' associations(*Associations des Parents et Amis de l'Ecole - APAE)*. The role played by these associations is essential since they often guarantee, in the field, that schools operate correctly (development of action plans, payment of some teachers, etc.).

12.2.3.2 *Primary education in the mine area*

In theory, children depend on public schools as defined by the prefecture educational grid. However, there is a lack of primary schools and the existing ones are either inaccessible to many children (too far away or some rural tracks are temporarily impassable during the rainy season) or ill-equipped (in terms of material and human resources) to receive all the children.

Given the lack of a public service, some locations pool their resources and build community schools. They incur all the operating costs including teachers' accommodation and wages. Since they are not approved, community schools are not recognized by the relevant public authorities.

Everywhere in Guinea, there are many madrasas receiving children from several neighboring villages. Madrasas are "informal schools/classes" (most of the time, children sit on a mat in front of the master's house (or *karamoko*) where they are taught theology, the Quran and writing in Arabic. Koranic education is not incompatible with education in French. When children can, they follow both.

In order to better understand the current practices in terms of access to education, it is essential to assess the nature of the educational offer, especially in the first cycle. All the schools attended by children in the MA were visited. The main information on the way they were run for school year 2013-2014 is summarized in *Table 12.3,* hereinafter. Madrasas were not specifically reviewed as their number was too high and the way they are run could significantly vary from one location to the next.

Table 12.3 Primary education in the MA and its surroundings during school year 2013-2014

Location	*Type*	Year of building	*Sponsor*	Grades of the primary cycle available in 2013 – 2014	*2013-2014 attendance*	Including girls	*% who passed the CEP*** in 2014*	Number of pupils/ classroom	*Number of pupils / teacher*	Number of pupils / table-bench	Fee (GNF)
Soucka	*Public*	1995	*RC of Sangarédi*	1 / 2 / 3	*83*	41	*NA*	41.5	*83.0*	1.8	5,000
Wossou	*Public*	2001	*Community*	3 / 6	*66*	32	*ND*	33.0	*33.0*	1.1	3,000
Doubhi Dow	*Public*	2007	*GAC*	2 / 3 / 4 / 6	*245*	102	*84.6*	40.8	*81.7*	2.0	5,000
Balahoun Pont	*Public*	2012	*State*	1 / 3	*102*	46	*NA*	51	*51*	2.0	8,000
Dambantian*	*Public*	2000	*State*	2 / 5	*77*	4	*NA*	77	*77*	2.1	10,000
Missidé Tantouloumane	*Public*	2013	*State*	1	*ND*	ND	*NA*	ND	*ND*	ND	10,000
Gaïka Djiabéré*	*Public*	2002 / 2014	*Community / WB*	2 / 3/ 4	*75*	48	*NA*	37.5	*37.5*	3.4	ND
Balandougou*	*Public*	1962	*State*	2/ 3 / 5 / 6	*146*	73	*100*	48.7	*48.7*	4.9	25,000
Parawol*	*Public*	1998	*Community*	2 / 6	*83*	30	*0*	83.0	*83.0*	3.6	ND
Kandomba*	*Public*	2003	*State*	6	*24*	9	*20.8*	24	*24*	1.5	Free
Kintao Daconta*	*Public*	1995	*State*	1 / 2	*77*	31	*NA*	77	*77*	2.9	8,000
Tinguilinta	*French-Arabic public school*	2007	*State*	All	*151*	63	*75*	30.2	*30.2*	1.5	5,000
Kalinko Rounde	*Community*	2011	*Community*	1 / 2 / 3	*52*	15	*NA*	17.3	*52.0*	5.8	ND
Hafia Misside	*Community*	2013	*Community*	1	*60*	31	*NA*	60.0	*60.0*	2.4	10,000
Thiankoye	*Community*	ND	*Community*	2 / 3	*48*	27	*NA*	48.0	*48.0*	ND	5,000
Guidaly	*Community*	2013	*Community*	1	*80*	35	*NA*	40	*40*	3.2	7,000
Boundou Lengué	*Community*	2011	*Community*	2 / 3	*120*	60	*NA*	60	*60*	6.0	Free
Baniwoun Kindy	*Community*	2013	*Community*	1 /2 / 3	*228*	113	*NA*	228	*228*	10	2,000
Pompo Missidé	*Community*	2013	*Community*	1	*54*	22	*NA*	54	*54*	5.4	ND
Kaoupné Center	*Community*	2005	*Community*	2 /3	*75*	46	*NA*	75	*75*	1.0	5,000
H.Bingal Landoma	*Private*	2009	*Private*	1 / 2 / 3 / 4 / 5	*72*	32	*NA*	36	*72*	75	Free**
TOTAL					***1,918***	**860**		**58.1**	***61.9***	**3.0**	

* These schools are outside the MA but are attended by children from the MA.

** Children attending the private school in H.Bingal Landoma do not pay enrolment fees but have to pay a 10,000 GNF monthly fee.

WB: World Bank NA: Not Applicable, ND: Not Disclosed.

*** CEP means Certificat d'Etudes Primaires (Primary School Certificate)

Source: INSUCO

Considering all the primary schools attended by children from the MA:

- In 2013-2014, there were 12public schools including a French-Arabic one (Tinguilinta), 8 community schools and 1 private school that could receive children from the MA. It should be noted that a public school was built in 2013 in Kaoupné Center but it was not open at the beginning of school year 2013-2014.Half of the schools were built by the local community. Those of Wossou, Gaïka Djiabéré and Parawol later became public schools.

- All the schools received 1,918 pupils including 44.8% of girls during that school year.

- The French-Arabic public school in Tinguilinta is the only one to provide full primary education, i.e. from 1st to 6th grade. The other schools offer on average 2 or 3 grades only, which change from one year to the next depending on children's progress and needs. Depending on the grade(s) offered by the schools, children have to go to different schools. The specific case of the Kandomba school should be pointed out since it changes grades every year in order to follow the same group of pupils throughout their primary education (from 1st to 6th grade).

- Six public schools offer the possibility to take the primary education final exam (CEP). However, few pupils register (103in June 2014). The success rate greatly varies from one school to the next: from 0% to Parawol to 100% in Balandougou. Such gaps are essentially due to the teaching and learning conditions.

- Grades do not necessarily depend on the number of available classrooms or teachers. Several grades are often gathered in the same classroom or a teacher may go from one classroom to another to teach. There are on average 58.1 pupils per classroom and 61.9 pupils per teacher. Besides, there are on average 3 children per table-bench. Although public schools are generally better-off than community schools (hard-standing structures), teaching/learning conditions do not only depend on this public/community dichotomy.

Figure 12.14 Classroom in Pompo Missidé



Source: INSUCO

Figure 12.15 Classroom in Balandougou

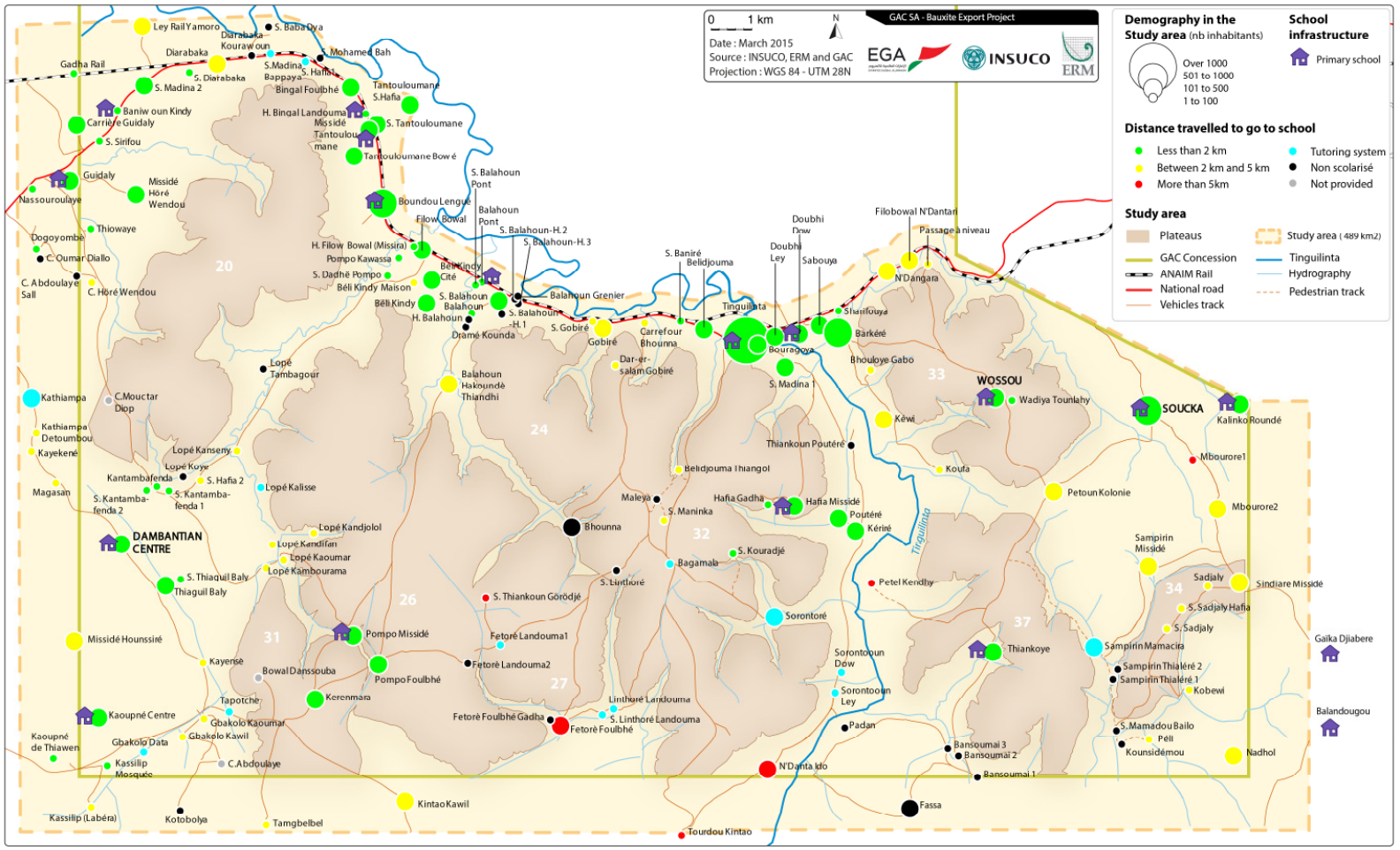


Source: INSUCO

Figure 12.17 shows the primary schools in the MA as well as the distances children have to cover to go to school[1].It should be noted that for reasons of geographic scale and clarity of the map, the schools in Kandomba, Kintao Daconta and Parawol, all outside the study area, are not shown on the map.

[1] The access to education map shows the average distances covered by children to go to school in 2013-2014. When children had to go to several distant schools depending on the grades, the furthest one was retained.

Figure 12.16 Access to education in the MA



Among the 155 locations in the area, children from:

- twenty nine locations are not sent to school;
- sixty locations cover less than 2 km to go to school;
- forty three locations cover from 2 km to 5 km to go to school;
- six locations cover more than 5 km to go to school; and
- When parents can afford it, children have tutors in lieu of school in Tinguilinta, Sangarédi or Boké in order for them to attend public or private school in town. This trend is observed in 10 locations.

It should be highlighted that no information on access to education in the following villages could be obtained: Bowal Danssouba, C.Abdoulaye and C.Mouctar Diop, as mentioned in *Section 11.1*.

12.2.3.3 *Secondary and higher education*

Besides primary schools, there is no further education option complying with the national requirements in the MA.

For secondary education (secondary and high school), students have to go to:

- Sangarédi where there are 3 public and 6 private schools (including both secondary schools and high schools);
- Tanéné where there is one secondary school; or
- Hamdallaye where there is one secondary school.

University education and vocational training are available in Boké which is quite well equipped with:

- the Boké vocational training center (*Centre de Formation Professionnelle*) which provides traditional training courses in mechanics, boiler making, building, joinery, building electricity, etc.;
- the Boké community healthcare training school (*Ecole des Soins de Santé Communautaire*);
- the Boké primary school teachers training school (*Ecole Normale des Instituteurs*); and
- the Boké higher institute of mines and geology (*Institut Supérieur des Mines et Géologie*).

12.2.3.4 *Practices and levels*

In the mine area, practices and levels of education greatly vary when considering:

- Population gender. Females have generally less access to education compared with males for socio-cultural reasons.

- The geographic area. Roadside locations have indeed more education infrastructures which are easily accessible to many children. Households in these locations have higher levels of education and skills and settled there in order to find better professional opportunities, notably through the GAC Project.

All the data below will be presented for the whole MA and taking into account gender and RA/IA gaps.

12.2.3.5 *Enrolment rate*

Enrolment rate is defined as the share of children aged from 7 to 13 who go to a formal school[1]. In the MA, according to the household surveys, this rate is 47%, below the national average (51%) (*UNESCO, 2012*).The distance to schools and/or poor teaching and learning conditions do not encourage households to send their children to primary school. On the whole and as shown in *Table 12.4* below, boys living in the RA most attend school. Conversely, girls in the IA less go to school.

Table 12.4 Gross enrolment rate in primary school (%)

Area	*Boys*	Girls	*Total*
RA	*56.3*	49.5	53.2
IA	*46.3*	38.8	42.8
MA	*50.4*	43.1	47.0

Source: INSUCO

Based on the household surveys, only 38.1% of males and 23.9% of females over 7, including adults attend or attended school. Indeed, as almost everywhere in Guinea, the new generations more systematically attend school.

Primary school attendance does not necessarily means that individuals have a good command of French, the official language that is taught in school. Many people who went to school are still not literate when finishing their education course.

12.2.3.6 *Literacy and education levels*

Literacy rate corresponds to the share of individuals over 7 (theoretical age when children enter 1st grade) who can read and write in a given language. This rate for French is generally very low in the mine area: 19.9%.

As for school enrolment and as shown in *Table 12.5*, males in the RA are the most literate in French and females in the IA are the least so.

[1]It includes children attending public, community, private (religiously affiliated or not) and French-Arabic schools.

Table 12.5 Rates of literacy in French (%)

Area	*Males*	Females	*Total*
RA	*32.1*	17.2	24.6
IA	*21.2*	11.5	16.3
MA	*25.9*	14.0	19.9

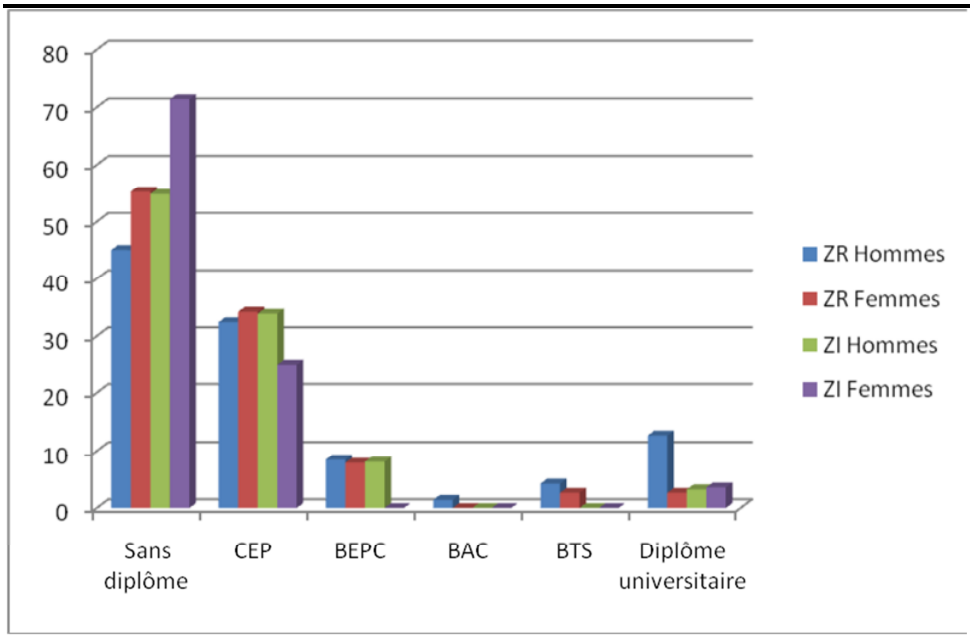
Source: INSUCO

Based on the household surveys, 58.3%of individuals over 7 dropped out of primary school, including 16.1% in 6th grade. Most of them are individuals who failed the final exam (CEP) granting access to secondary school and who therefore had to drop out of school without being able to repeat a year. The school drop-out trend is similarly identified in secondary school (first part of the second cycle). However, girls are more affected than boys due to the need to help with the daily household chores, marriage and early pregnancy.

Enrolment rates are of little meaning if they are not correlated with the education levels of the population. In the MA, more than half of individuals over 20 (53.8%) have no degree (including primary and secondary degrees), whether individuals went to school or not, and only a third (32.2%) obtained the Certificat d'Etudes Primaires (CEP). The share of individuals who obtained a degree sharply decreases with their progress in the school cycles. Only 7% obtain the Brevet d'Etudes du Premier Cycle du second degré (BEPC); and they are even fewer to pass the final exam (Baccalauréat). By contrast, when students finish high school and pass the final exam, they almost systematically opt for higher education in the hope of graduating. 2% have a vocational training certificate (Brevet de Technicien Supérieur – BTS) and 4.5% get a university degree.

Figure 12.17 summarizes the education levels of the population over 20, by gender and for both the RA and IA. Such data confirm that men in the RA have the longer access to education and conversely, that of women in the IA is very restricted.

Figure 12.17 Education levels of the population over 20 in the MA



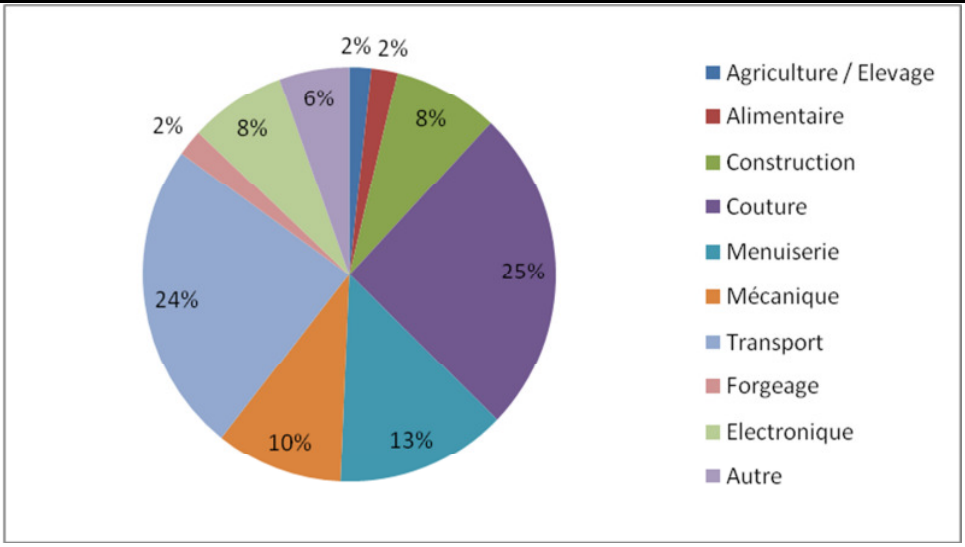
ZR Hommes: road area males / *ZR Femmes:*roadarea females /*ZI Hommes:* inland area males / *ZI Femmes:* inland area females / *Sans diplôme:* without a diploma / *CEP:* primary education / *BEPC:* national diploma / *BAC:* Bachelor's degree / *BTS:* the technician certificate (BTS) is a national diploma of French higher education / *Diplôme universitaire:* university diploma

Source: INSUCO

12.2.3.7 *Further training*

Approximately 14.8% of individuals over 7 years of age in the mine area served an apprenticeship or followed a vocational training course in their life. About 4.3% declared themselves as still being apprentices in early 2015. Apprenticeship generally applies to people who never went to school due to their lack of financial resources, or who dropped out of school at an early stage. The industries gathering the largest number of apprentices are, as shown on Figure 12.18, sewing (25.3%), transport (24.4%) and joinery (13.3%).

Figure 12.18 Type of further training following in the MA



Agriculture; Elevage: agriculture; breeding / *Alimentaire:* nutritional / *Construction:* construction/ *Couture:* sewing / *Menuiserie:* carpentry / *Mécanique:* mechanics / *Transport:* transport / *Forgeage:* forging / *Electronique:* electronics / *Autre:* other

Source: INSUCO

12.2.4 *Healthcare*

12.2.4.1 *Summary of the Guinean health system*

In the healthcare sector, the national strategy still relies on the national health development plan (*Plan National de Développement Sanitaire - PNDS*) for the 2003-2012period, focusing on the increase in primary healthcare. Guinea has an integrated public healthcare system, i.e. national healthcare programs areapplied to all the healthcare facilities and a referral system is implemented among the various territorial levels in a pyramid-shaped manner. The healthcare system includes the following infrastructures:

- National hospitals acting as teaching hospitals (*Centres Hospitaliers Universitaires - CHU*) with all the specialties. There are two in Conakry.

- Regional prefectural hospitals which are devolved structures. For each hospital, a contract setting out the objectives and resources (*Contrat d'Objectifs et de Moyens - COM*) with average occupancy rates (bed occupancy and turnover rates) and availability of medicines, is prepared by the State. The extent of the services provided by these hospitals depends on the equipment and staff available there.

- Healthcare Centers (HC) and Primary Healthcare Centers (PHC) correspond to the referral level for 20,000 to 25,000 inhabitants in urban areas and 12,000to 20,000 inhabitants in rural area. The area of influence and control of

the healthcare center does not necessarily coincide with the limits of the commune where it is located. It covers a theoretical 10 km radius.

- Healthcare Post (HP) make up for the poor accessibility to curative treatments for the population. They also relay the prevention activities implemented by the healthcare centers through community agents. The healthcare station shall attend to at least 3,000 inhabitants in a 10 km radius. It is therefore located at the district level. Costs associated with the presence of medical staff are incurred by the community.

12.2.4.2 *Nature of the public healthcare system*

According to the healthcare map, patients in the Sangarédi SP are referred to the Sangarédi Primary Healthcare Center (PHC) and the HP in the districts of Soucka, Boullérè (outside the MA) and Balandougou (outside the MA). The district of Wossou has no HP.

In the Tanéné SP, patients are referred to the Tanéné Healthcare Center (HC) and the HP in the districts of Kintao Daconta and Dambantian. The district of Dambantian has two HP: one in Dambantian and one in Tinguilinta (which is actually located in Belidjouma). Among the eight districts within the GAC Project area, three have no healthcare services available on their territory; these are N'Daghara, Wossou and Boullérè. The development of the area near the GAC Project base indeed encouraged GAC SA to fund a new medical facility in 2009.

Public healthcare facilities are the only ones in the MA to hold a license allowing them to practice medicine. Their operation however depends on the presence and availability of medical staff. When no staff is available, HP are shut down and patients have to go to another facility located further away. This was the case in Soucka for 7 years (the HP has been operational since 2007 whereas it was built in 2000).

In order to understand population behaviors in terms of healthcare, it is essential to assess the nature of the services available. All the facilities visited by people living in the MA were visited. The main information on the way they are run is summarized in *Table 12.6*. Information on two private clinics in Tinguilinta is also shown as a reference.

Table 12.6 Healthcare services available in the MA

Location	Type	Year of opening	Sponsor	Number of beds	Services available	Staff	Price of PCC for a child (GNF)	Price of PCC for an adult (GNF)	Number of Patients/month
Soucka	Healthcare Post	2000	State	1	PCC	1 HT	Free	Free	45
Balandougou*	Healthcare Post	2000	State	6	PCC - PNC - De - EPI	1 HT / 1 midwife	Free	Free	40
Kintao Daconta*	Healthcare Post	2008	CBG	5	PCC - PNC - De - EPI - MS	1 HT	5,000	7,000	46
Dambantian	Healthcare Post	2000	State	3	PCC - PNC - De - EPI	1 HT	Free	Free	35
Tinguilinta	Healthcare Post	2009	GAC	4	PCC - PNC - De - EPI - MS	1 HT / 2 midwives/ 1 trainee nurse	1,000	2,000	125
Tanéné*	Healthcare Center	1997	World Bank	7	PCC - PNC - EPI - MS - De - FP - Mal	1 nurse / 1 trainee HT	1,000	2,000	ND
Sangarédi*	Primary healthcare Center	1980	State /CBG	19	PCC - PNC - EPI - MS - Lab - HIV - U- De - FP - Mal	3 doctors / 4 nurses / 3 HT	1,000	2,000	ND
Boké*	Hospital	1958	State	80	General and specialized medicine / Examination support services	9 doctors / 48 other medical staff	5,000	7,000	>800
Tinguilinta	Aly Boniya Camara private healthcare center	2009	Private	4	PCC - MS	1 nurse	Free	5,000	32
Tinguilinta	Sabadou private healthcare center	2006	Private	6	PCC - De	1 nurse / 2 midwives	3,000	5,000	85

* These Facilities are outside the MA, however they are visited by households from the MA.
Services available: PCC = Primary Curative Care, PNC = Prenatal Care, De = Delivery, EPI = Extended Program on Immunization, FP = Family Planning, Mal = Child malnutrition, MS = Minor Surgery / HT = Healthcare technician / ND: Not Disclosed
Source: INSUCO

As far as the healthcare stations visited by households in the MA are concerned:

- Two of the five HP were built by private entities, namely GAC and CBG mining companies. The State has not built healthcare stations since 2000.

- Healthcare stations are all run by healthcare technicians (*Agents Techniques de Santé -ATS*) which medical training is basic. As a result, the services available are restricted and require no specific skills or elaborate diagnoses. The services available are Primary Curative Care (PCC), Prenatal Care (PNC), deliveries and Extended Programs on Immunization (EPI). The Tinguilinta HP is however suitably staffed and equipped for minor surgeries.

- Except the HP in Tinguilinta, HSts are dilapidated. Equipment is lacking: there are generally less than 5 beds available per facility (however all fitted with a mosquito net), one blood pressure monitor, one thermometer and some bandages. There is often a shortage of medicines[1]and HPs often have to source them from unauthorized suppliers. Medical waste such as syringes are collected and taken to the reference HC. Other waste are incinerated and buried.

- Occupancy statistics for PCCs or deliveries vary depending on the accessibility of the facility and available skills. As a result, the Tinguilinta HP performs on average 125 examinations and up to 50 deliveries a month, whereas the Balandougou HP only performs 40 and 3 respectively.

[1] The healthcare centrescenters in Sangarédi or Tanéné are supposed to supply the HSts once monthly reports are submitted.

Figure 12.19 Consultation room in the Soucka HP



Source: INSUCO

The HC in Tanéné is only run by a nurse assisted by a trained healthcare technician, ill-equipped (7 beds) and unable to provide the level of care imparted by its status.

Patients have to go to the Sangarédi PHC or Boké hospital to receive better medical treatments. The Sangarédi PHC includes 10 services and is staffed with 3 doctors and 4 nurses. Besides, thanks to the 19 beds available, the PHC receives patients for both outpatient and inpatient treatments.

The Boké hospital provides some 15 services, including some specialized ones (ENT, ophthalmology, etc.) with 9 doctors and 48 other medical staff. Its capacity is however limited given its status and geographical scope: there are only 80 beds available.

Usually, when patients cannot be treated in a HP, they are referred to the Tanéné HC or Sangarédi PHC. Similarly, when patients cannot be treated in the PHC, they are referred to the Boké regional hospital, where most medical specialties are available. Some people are also taken to the CBG private facilities that are the Sangarédi clinic (commonly called hospital) and Kamsar[1] hospital

[1] The CBG clinics are open to anyone. CBG employees and its subcontractors are covered free of charge or at a special rate. Other patients have to incur treatment costs which are very expensive compared with the rates in neighboring facilities.

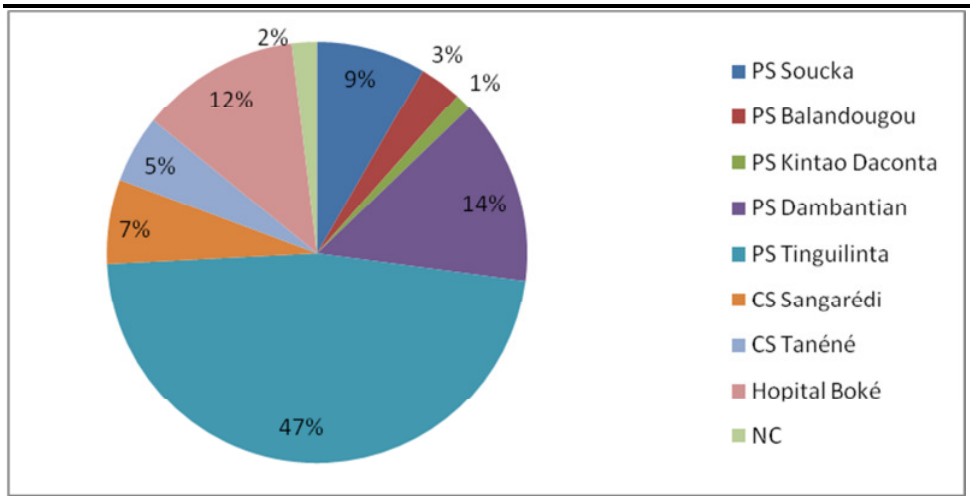
It should be pointed out that several health development key figures have already been involved with public healthcare facilities, in the MA (UNICEF with the Tinguilinta HSt, Program"Stop Palu" in Balandougou) or in its vicinity (Volontaire du corps de la paix, CAM with the Tanéné HC). Their activities were however sporadic and now havefew consequences on the services provided. Only the Boké hospital still receives outside support from local or international entities (GAC, Fondation ALCOA, ONG Voir pour la Vie, Solthis, etc.).

12.2.4.3 *Household healthcare strategies*

According to the household surveys, 40.7% of the population in the MA was sick in the past three months. 80.7%sought medical attention.

Household behaviors when seeking medical attention are quite similar in the RA and IA. Overall, 67%first visit public healthcare facilities, more specifically healthcare stations. Nevertheless, in addition to referral to a specific facility, household strategies consider other criteria. As shown in *Figure 12.20* and *Figure 12.21*, the Tinguilinta HP is indeed visited by nearly half of the patients living in the MA, including by some people living in distant villages such as Kerenmara. People from certain localities such as Bagamala or Mbouroré 1 would rather directly go to the Sangarédi PHC or in the case of Kathiampa or Missidé Höré Wendou, to the Boké Hospital.

Figure 12.20 Visits to public healthcare facilities depending on the locations in the MA

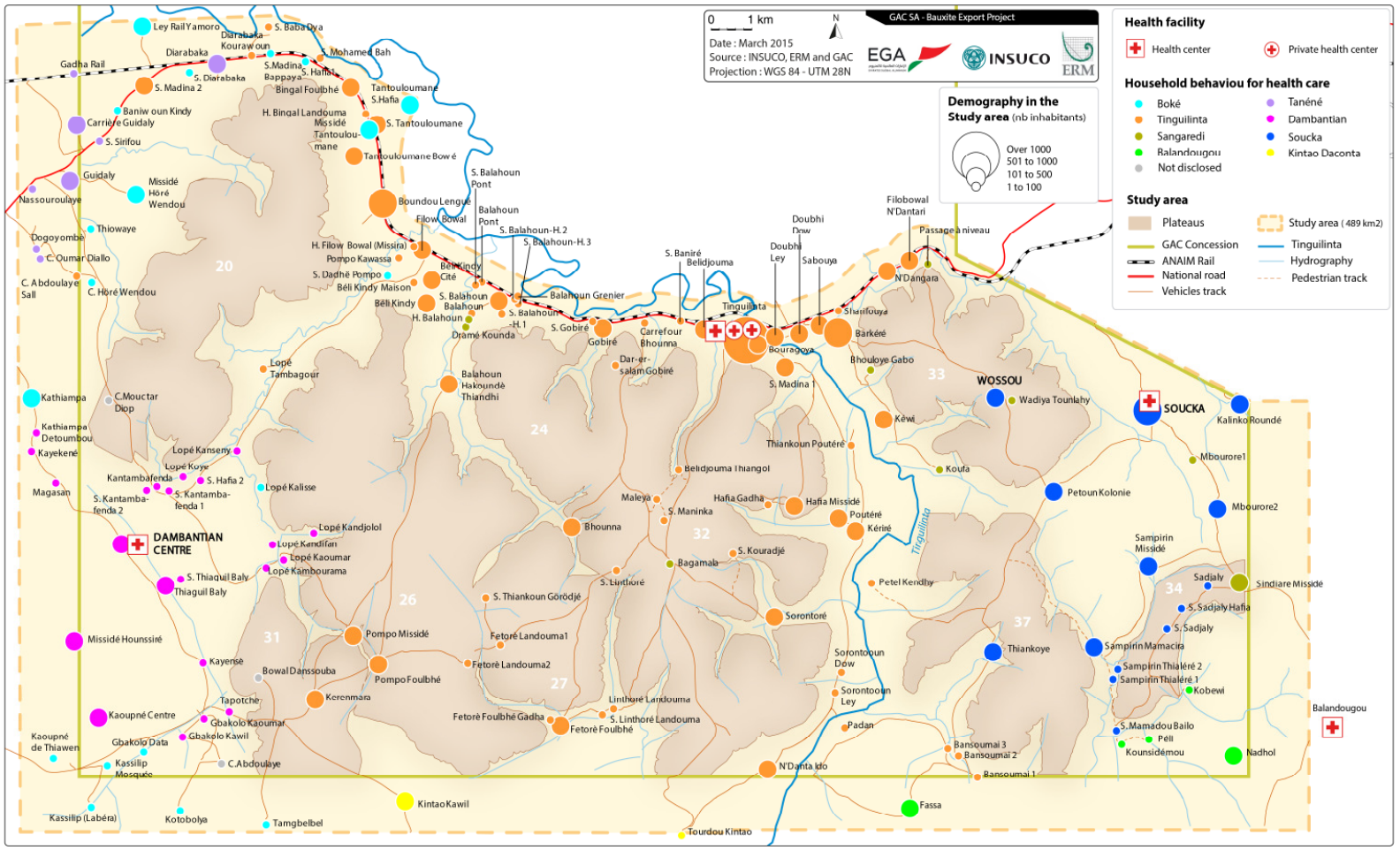


PS: Healthcar Post / CS: Healthcare Center / *Hôpital:* hospital / *NC:* not communicated

Source: INSUCO

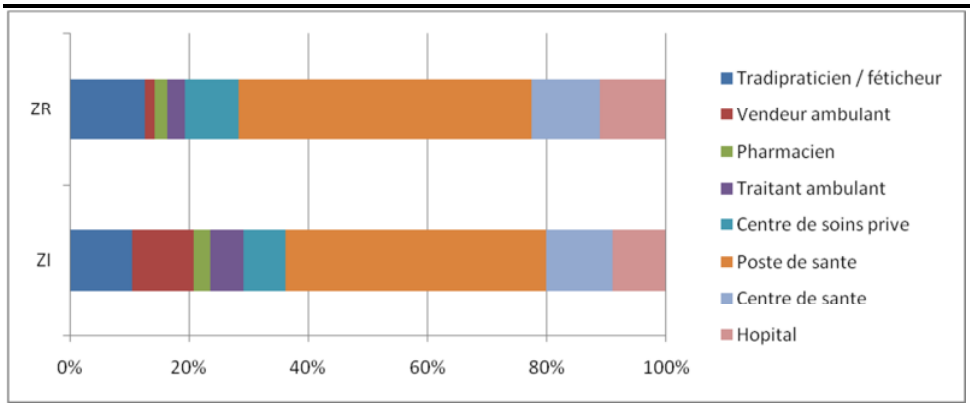
It should be noted that household healthcare strategies differ during the rainy season. The distance to public facilities and impassable tracks may prevent households from moving sick people that may sometimes be in a critical state.

Figure 12.21 Access to healthcare in the MA



About a third of households in the MA do not visit public facilities to seek medical attention[1]. People turn to other alternatives that are more or less recognized or effective from a medical standpoint. Healthcare has indeed become an economic sector and fledgling market in Guinea and in the MA, private initiatives are emerging. Behaviors are somewhat different between the RA and IA, as shown in *Figure 12.22.*

Figure 12.22 Household behaviors regarding healthcare



Tradipraticien; féticheur: traditional healer; shaman / *Vendeur ambulant :* street vendor / *Pharmacien :* pharmacist / *Traitant ambulant :* mobile treating physician / *Centre de soins privé* : private care center / *Poste de santé :*Heealthcare Post/ *Centre de santé*: healthcare Center / *Hôpital :* hospital

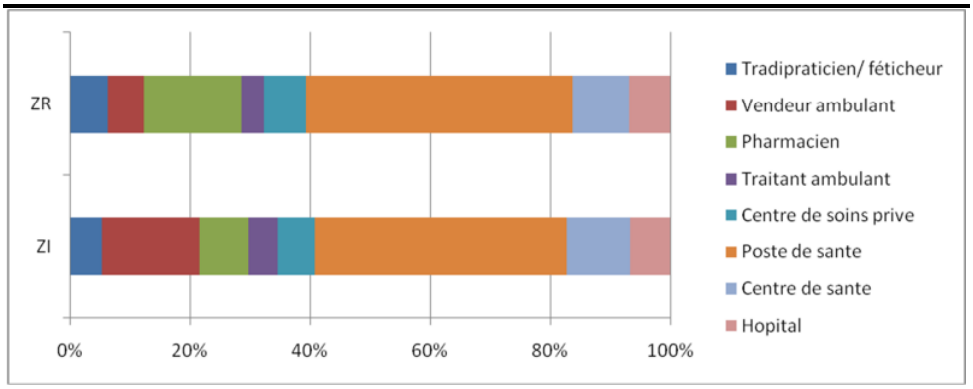
Source: INSUCO

In the RA, 9% of households go to private healthcare facilities, including the two clinics in Tinguilinta. In the IA, households turn more to itinerant practitioners or vendors (5.5% and 10.2%respectively).Although traditional practitioners/fetish-priests are present in villages, households in the RA do turn more to them. They take advantage of the fact that they are itinerant and travel via the national road.

In addition to consultation, slightly over 88.4% of households have bought medicines over the past three months. Since 2005, Guinea has been applying a split-rate system, meaning that consultation, hospitalization and medicines are to be paid separately. Households can therefore buy their medicines wherever they want. *Figure 12.23* reveals however those household behaviors regarding the access to medicines are similar to those regarding the access to healthcare.

[1] As the first place of consultation

Figure 12.23 Household behaviors regarding access to medicines



Tradipraticien; féticheur: traditional healer; shaman / *Vendeur ambulant :* street vendor / *Pharmacien :* pharmacist / *Traitant ambulant :* mobile treating physician / *Centre de soins privé :* private care center / *Poste de santé :* Healthcare Post / *Centre de santé*: Healthcare Center / *Hôpital :* hospital

Source: INSUCO

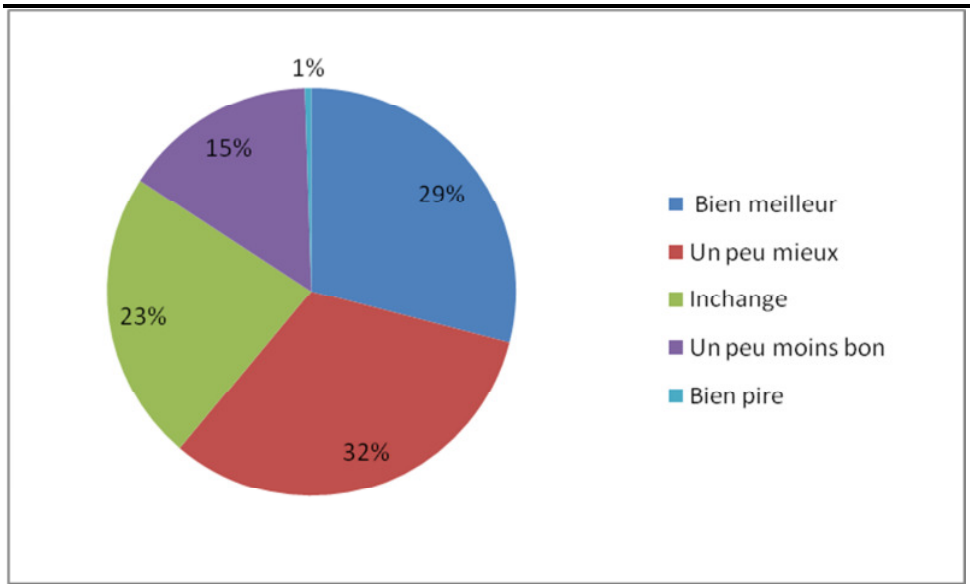
Households going to public facilities generally buy their medicines there (59.8%), as far as possible. In the RA, 16.3%of households also buy their medicines from pharmacists[1]. By contrast, 16.2% of households in the IA buy their medicines from itinerant vendors. The informal sale of medicines is widespread across the area and characterized in two different manners: emergence of unauthorized pharmacies, especially along the road and informal itinerant vending of "pharmaceuticals" (with often uncertain origins, composition and expiry date).

It should be specified that nearly one household out of two in the MA also resorted to the traditional pharmacist. This practice may be used in addition to modern medicine. It may also replace it, due to the fairly steep price of medicines for families with modest income, the distance to go to a public health centers as well as traditional believes .

In spite of limited healthcare services, local populations are aware of the importance to be treated and seek medical attention. According to household surveys and as shown in Figure 12.24, 61% of heads of households think they are healthier compared with last year.

[1] People considered here as pharmacists are those who followed medical or paramedical training and who sell medicines.

Figure 12.24 Current health of heads of households compared with last year



Bien meilleur: much better / *Un peu mieux:* a little better / *Inchangé :* unchanged / *Un peu moins bon :* a little less good / *Bien pire :* much worse

Source: INSUCO

12.2.4.4 *Pathologies and awareness of diseases*

12.2.4.5 *Main pathologies in the MA according to households*

According to the household surveys, 61% of the population consider having had malaria[1] in the past three months. Malaria is the main endemic disease in the MA as well as the first cause of consultation and hospitalization in public healthcare facilities. According to managers of public healthcare centers, 24.5% of consultations and 20.9% of hospitalizations at the Boké hospital were due to malaria. , Patients suffering from malaria brought to their hospitals are in serious condition and at an advanced stage, since populations first try to treat themselves with products from the pharmacy.

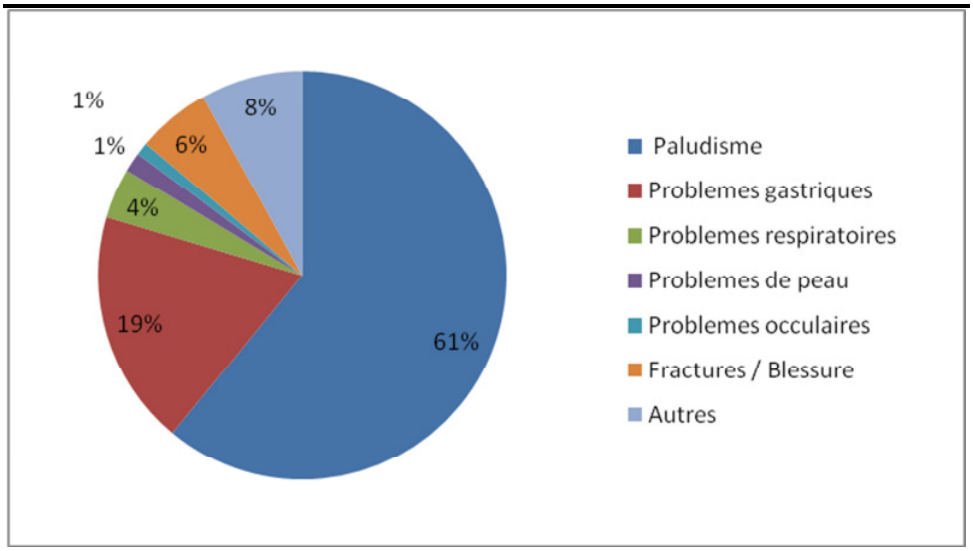
Although there is no specific program to fight malaria in the MA, the use of mosquito nets is widespread: 89.6% of households use them[2]and there is approximately 1 mosquito net for 2.5 people.

[1] Such data are derived from a self-evaluation of populations with no health-related knowledge. It is more a matter of associated symptoms than diseases per se. Representations are based on a self-evaluation by each individual and reported as such in the household surveys

[2] Households living in the Sangarédi Sub-Prefecture use more mosquito nets. No campaign was organised in the MA. However, the vicinity of locations where malaria awareness campaigns took place contributed to some information sharing.

As shown in *Figure 12.25*, and according to the household surveys, the other pathologies affecting populations in the MA are digestive problems (16%).

Figure 12.25 Pathologies in the MA according to households



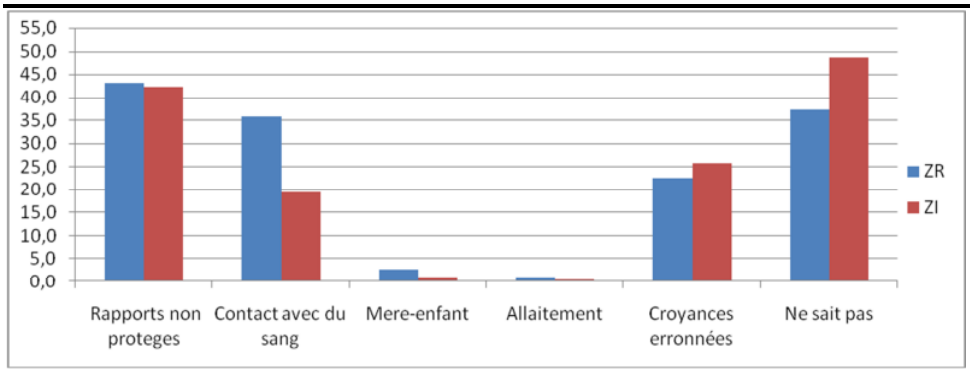
Paludisme: Malaria / *Problèmes gastriques:* gastric problems / *Problèmes respiratoires:* breathing problems / *Problèmes de peau :* skin problems / *Problèmes occulaires :* eye conditions / *Fractures ; Blessures :* fractures ; injuries / *Autres :* other

Source: INSUCO

12.2.4.6 *Awareness of HIV/AIDS*

Approximately 98% of households, whether in the road area or inland area, have already heard about HIV/AIDS. By contrast, as shown in *Figure 12.26*, their knowledge on the modes of transmission of the virus is limited or wrong. Fifty percent of households in the inland area said they were not aware of how someone can be infected.

Figure 12.26 Knowledge on the modes of transmission of HIV/AIDS



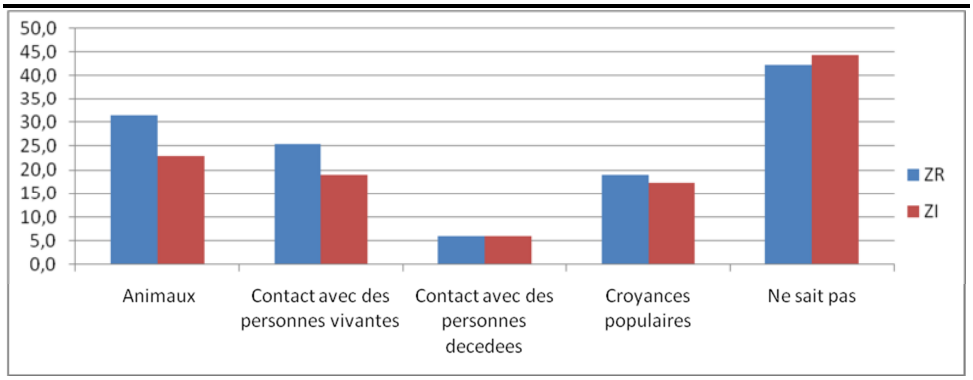
ZR: road area / *ZI:* inland area / *Rapports non protégés:* unprotected intercourse / *Contact avec de sang:* contact with blood / *Mère-Enfant: mother-to-child / Allaitement:* nursing / *Croyances erronnées:* mistaken beliefs / *Ne sait pas:* do not know

Source: INSUCO

12.2.4.7 *Awareness of the Ebola virus*

As far as the Ebola virus is concerned, the situation is more disparate. 94% of households in the RA have already heard about it, against 83% only in the IA. The modes of transmission of the virus are generally poorly known in both areas, as shown in *Figure 12.27*. Half of the population declares being unaware of how someone can be infected. One individual out of 5 has incorrect ideas.

Figure 12.27 Knowledge on the modes of transmission of the Ebola virus



ZR: road area / *ZI:* inland area / *Animaux:* animals / *Contact avec des personnes vivantes:*interaction with living individuals / *Contact avec des personnes décédées:* interaction with deceased individuals / *Croyances populaires:* popular beliefs / *Ne sait pas:* do not know

Source: INSUCO

According to the Ebola response plans, healthcare stations are in charge of raising the awareness of local populations. However, resources are minimal (buckets with bleach solution in water) and messages incomplete and ill-suited to a predominantly illiterate population. Besides, most HTs do not have the resources required (lack of means of transport) to visit villages and conduct these awareness campaigns.

12.2.4.8 *Extended Program on Immunization (EPI)*

The purpose of the Extended Program on Immunization (EPI) which has been active in Guinea since 1979[1], is to "curb morbidity and mortality rates associated with diseases that may be prevented through immunization of children aged 0-11 months and pregnant women". The implementation of the EPI is the responsibility of both the public authorities and healthcare facilities, and relies on the involvement of the local communities through community agents. In theory, the EPI covers the whole MA. However, few households seem to be aware of this issue. According to our surveys, only 45.5% of children under 15 (living either in

[1]Since 1988, the EPI has been integrated to the activities of the EPI/SP/ES (Expanded Programme on Immunisation / Primary Healthcare / Essential Medicines). It deals with polio, tetanus, diphtheria, whooping cough, hepatitis and tuberculosis.

the RA or IA) were immunized against polio, tetanus, diphtheria, whooping cough, hepatitis and tuberculosis.

12.2.5 *Access to water and sanitation*

12.2.5.1 *Water supply*

Household strategies regarding drinking water supply may greatly vary. They depend both on the location of the village and distance to a water body (spring, river, small swamp), and on the potential presence of infrastructure.

In the MA, 12 localities have no access to surface water[1] at all. The other 143 localities have one and provide drinking water over there even if there is a nearby drinking water infrastructure. However, for these 143 localities, the access to surface water is not regular over the year and depends on the season. Many rivers run dry as soon as March or April, thus compelling people to dig sorts of wells right inside the river bed, or to travel to more distant water bodies.

Figure 12.28 Surface water in S.Mamadou Bah and Fassa



Source: INSUCO

Besides, 80 traditional wells were registered in the MA. Three quarters of them are located in the RA. Wells are often rudimentary (simple hole, no lid, etc.), which does not ensure good water quality.

[1] Baniwoun Kindy, C.Höré Wendou, Doubhi Dow, Dhoubi Ley, Filow Bowal, H.Filow Bowal (Missira), S.Balahoun H-3, S.Madina Bappaya, S.Madina 1, S.Madina 2, Sorontoré and Tantouloumane Bowé.

Figure 12.29 Traditional wells in S.Madina Bappaya and Tinguilinta



Source: INSUCO

Finally, there are 26 hand pumps in the MA. They include closed boreholes and tubed wells fitted with a pump. These infrastructures are the main means of access to quality water since the water thus abstracted is protected from outside contaminations (infiltrations, dust, etc.).

Figure 12.30 Functional hand pump in Sindiaré Missiré and nonfunctional hand pump in Bouragoya



Source: INSUCO

Table 12.7 below details how each hand pump is operated.

Table 12.7 Operation of hand pumps in the MA

Location	*Functional*	Inhabitants /hand pump	*Year*	Sponsor	*Price*	Management committee	*Time of operation*
Sindiaré Missidé	*Yes*	255	*2000*	State	*Free*	Yes	*24/7*
Bansoumai1	*No*	NA	*2002*	Japan	*NA*	NA	*NA*
Mbourore2	*No*	NA	*2002*	Japan	*NA*	NA	*NA*
Wossou	*Yes*	257	*2003*	PACV	*Free*	Yes	*6am–6pm*

Filobowal N'Dantari	*Yes*	207	*2010*	GAC	*Free*	Yes	*6am–7pm*
N'Dangara	*Yes*	190	*2010*	GAC	*1,000GNF/adult /week*	Yes	*7am-10am / 4pm-6pm*
Doubhi Dow	*No> 12 months*	NA	*2008*	GAC	*NA*	NA	*NA*
Doubhi Dow	*Yes*	128	*2010*	GAC	*50GNF/20Lcan*	Yes	*6am–6pm*
Doubhi Dow	*Yes*	128	*2010*	GAC	*Free*	Yes	*6am–6pm*
N'Danta Ido	*Yes*	188	*2002*	Japan	*Free*	Yes	*24/7*
Bouragoya	*No > 9 months*	NA	*2010*	GAC	*NA*	NA	*NA*
Sampirin Mamacira	*Yes*	324	*2002*	Japan	*Free*	Yes	*6am-7pm*
Sampirin Missidé	*Yes*	392	*2000*	IFAD	*Free*	No	*24/7*
Belidjouma	*Yes*	386	*2011*	GAC	*50vGNF/20L drum*	Yes	*6h - 19h*
Thiankoye	*No*	NA	*2002*	Japan	*NA*	NA	*NA*
Sorontoré	*Yes*	172	*2000*	State	*Free*	Yes	*6am-7pm*
Soucka	*No*	NA	*2003*	Japan	*NA*	NA	*NA*
Soucka	*Yes*	627	*2003*	Japan	*Free*	Yes	*6am–7pm*
Kalinko Roundé	*Yes*	322	*2003*	Japan	*Free*	Yes	*6am–7pm*
Dambantian Center	*Yes*	69.5	*1992*	IFAD	*Free*	Yes	*24/7*
Dambantian Center	*Yes*	69.5	*2000*	IFAD	*Free*	Yes	*24/7*
Kintao Kawil	*No> 12 months*	NA	*1982*	SNAPE	*NA*	NA	*NA*
Guidaly	*Yes*	223	*2001*	Japan	*Free*	Yes	*6.30am–10.30pm*
Béli Kindy	*No > 10 years*	NA	*2002*	Japan	*NA*	NA	*NA*
Fetorè Foulbhé	*No > 6 months*	NA	*2002*	Japan	*NA*	NA	*NA*
Tinguilinta	*No > 12 months*	NA	*2008*	GAC	*NA*	NA	*NA*

NA: NotApplicable
Source: INSUCO

Out of all the hand pumps available in the area:

- There is on average 1 hand pump every 9 km²to the east of the river Tinguilinta (Sangarédi Sub-Prefecture) and 1 hand pump every 32 km² to the west of the river Tinguilinta (Tanéné Sub-Prefecture). Such sharp difference is due to the presence of many development support entities in the Sangarédi Sub-Prefecture involved in water supply.

- Over a third of hand pumps are located in the RA.

- 42% of hand pumps were built by the Japanese cooperation in the early 2000s and 31% thanks to GAC Project funding from early 2008. Only 3 hand pumps were built by the State or SNAPE.

- Over a third of hand pumps have been non-functional for at least 6 months. Most of the time, the broken part could not be replaced (hard to source locally, too expensive, etc.).

- Access to hand pumps (functional) in the RA is almost always for a fee of 50 GNF/ 20Lcan. In N'Dangara however, a 1,000 GNF weekly fee per adult is payable.

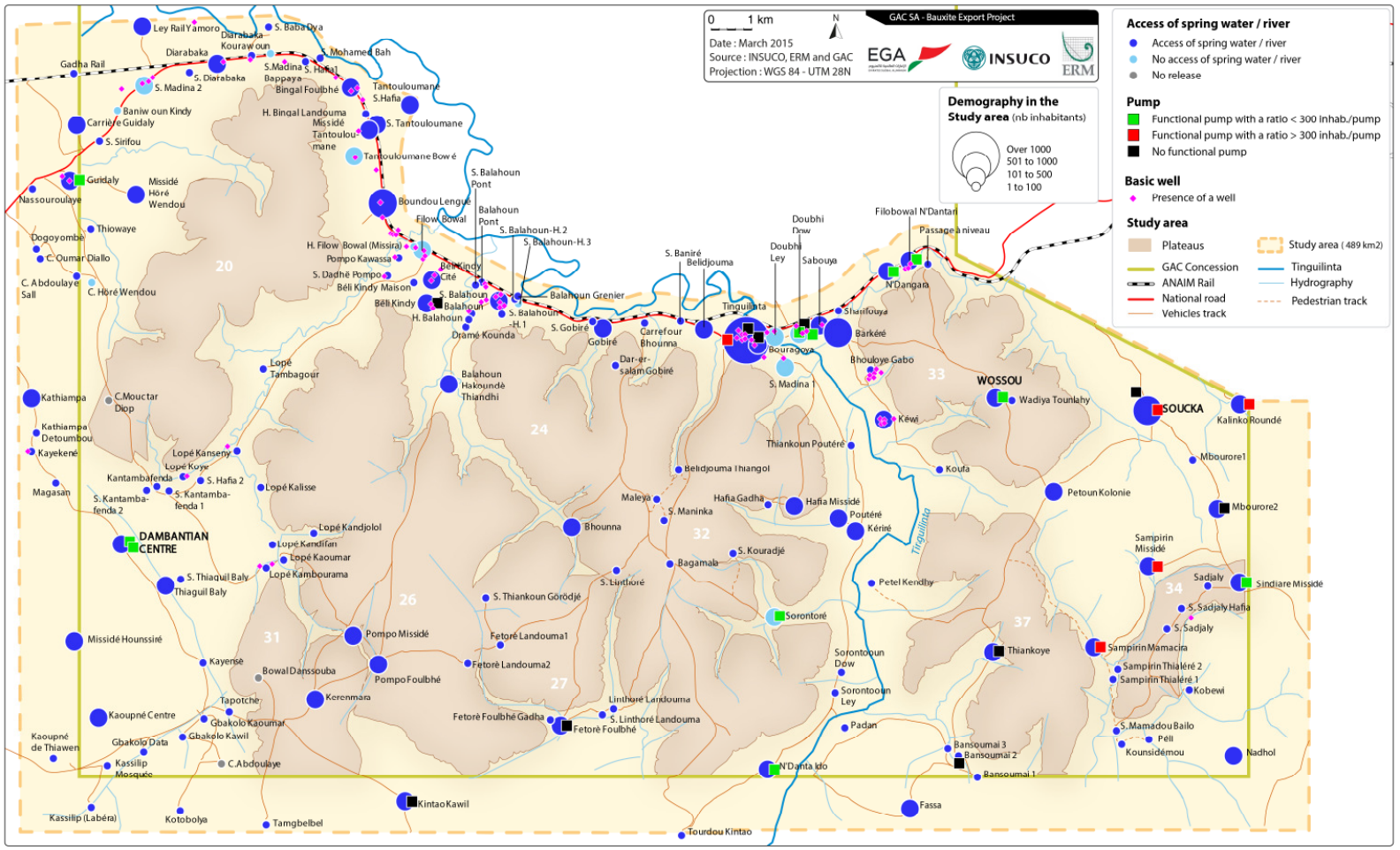
- In the locations where access to hand pumps is free, households may however have to exceptionally pay a fee for the maintenance or repair of the pump.

- All the functional hand pumps, except that in Sampirin Missidé, are managed by a management committee and/or a person in charge for the regular maintenance and collection of fees (both regular and exceptional, as required).

- The hand pumps (functional)in Soucka, Belidjouma, Sampirin Missidé, Sampirin Mamacire and Kaliko Roundé registered a ratio in excess of 300 individuals per pump, which is considered as the admissible limit in rural areas by the national program for drinking water supply and sanitation (*Programme National d'Alimentation en Eau Potable et d'Assainissement - PNAEPA*).

Figure 12.31 below shows the location of all the existing traditional wells and hand pumps, whether functional or not, and specifies whether locations have access to a surface water body.

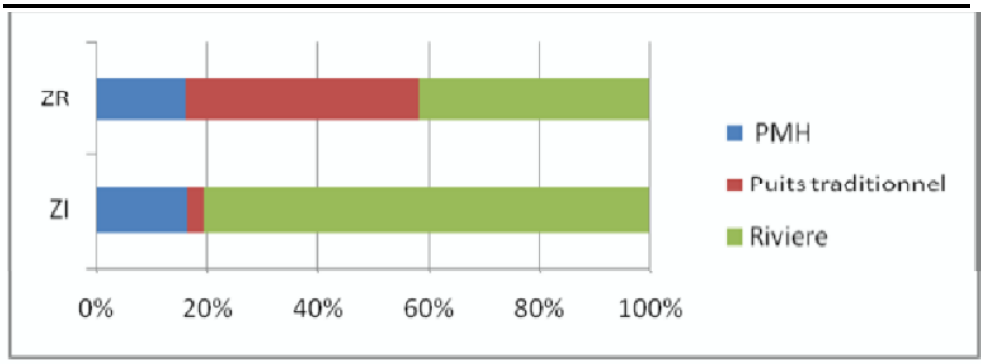
Figure 12.31 Access to drinking water in the MA



Household strategies regarding access to drinking water greatly vary depending on their location, as shown in *Figure 12.32*. In the RA, 42.1% of households use water abstracted from traditional wells. However, only 23.2% have one available in their concession. Many households abstract water from wells in neighboring concessions which is free of charge for the whole neighborhood. Besides, 16.2% of household abstract water from a hand pump. It is especially the case in Filobowal N'Datanri, N'Dangara, Doubhi Dow, Belidjouma and Guidaly where there is a functional hand pump.

In the RA, only 3% of households have access to a traditional well in their concession. Therefore, their practices are radically different. They are 80.6% who provide drinking water from surface water bodies (rivers, springs or small swamps). Only households living in villages where there is a functional hand pump use it to abstract drinking water, i.e. 16.4%.

Figure 12.32 Source of drinking water supply in the Road Area (RA) and Inland Area (IA)

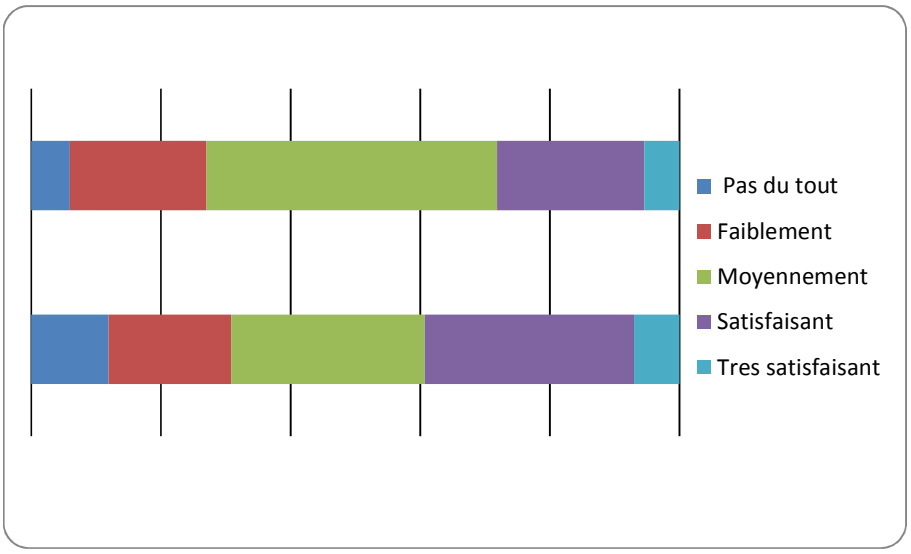


PMH: human-operated pumps / *Puits traditionnel:* traditional wells / *Rivière:* river

Source: INSUCO

Although they are aware that surface water may be harmful to health and that contamination risks are high when transporting and storing water at home, few households endeavor to improve the quality of the water they use. 33.9% of households are currently satisfied to very satisfied (notably the households using a hand pump) with the quality of the water they use. Nevertheless, the level of satisfaction with drinking water quality is higher in the IA than in the RA, as shown on *Figure 12.33*, due to regular water turbidity in traditional wells.

Figure 12.33 Level of satisfaction with drinking water in the IA and RA



ZR : Road Area / ZI : Inland Area ; Pas du tout: not at all / *Faiblement:* poor / *Moyennement :* moderate/ *Satisfaisant :* satisfactory / *Très satisfaisant :* very satisfactory

Source: INSUCO

Hygiene and household chores (to do the laundry and the dishes) take place in every surface water body (rivers, small swamps, etc.) in the IA. In the RA, the situation is a bit different: rainwater is used for hygiene (40.5% of households) whereas the laundry and dishes are done in rivers (71.4% of households).

Figure 12.34 Household chores in the watercourse in Poutéré

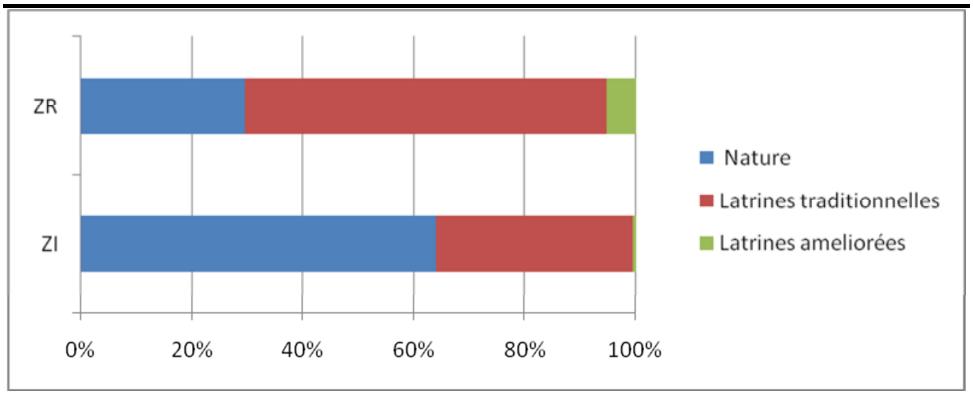


Source: INSUCO

12.2.5.2 *Sanitation*

Household behaviors regarding sanitation are virtually the opposite between the RA and IA. As a matter of fact in the RA, given the concentration of populations in more or less cramped spaces (e.g. in Tinguilinta), households had to change their habits for sanitary and privacy reasons. As shown in *Figure 12.35,* almost 70.3% of households declare using latrines. By contrast, in more remote locations within the MA, over 64.1% of households relieve themselves in the natural environment.

Figure 12.35 Sanitary facilities in the Road Area (RA) and Inland Area (IA)



ZR: road area; ZI: inland area; Nature: nature / *Latrines traditionnelles :* traditional latrines / *Latrines améliorées :* improved latrines

Source: INSUCO

The health impact associated with the presence of latrines should however be put in perspective. First, most latrines in the mine area are of the traditional type (pit dug in the ground, walls, doors and roofing absent or in a dilapidated state). As far as enhanced latrines are concerned (often several cubicles, tight and ventilated pit), they are generally poorly designed or located (on a slope, near a water body, etc.). The risks of soil, groundwater and surface water contamination remain high.

Domestic waste across the MA are disposed of in the environment (in front of house, in bottom lands or even around water bodies) or burnt at the house. No waste collection or treatment system is in place.

12.2.6 *Access to markets and staple food*

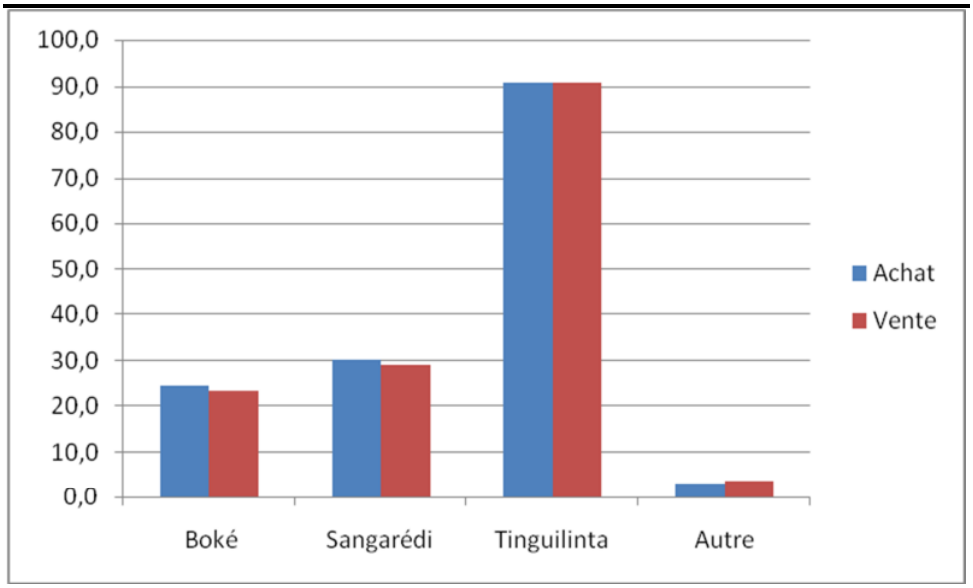
12.2.6.1 *Markets in the area and household habits*

The only market in the MA is the weekly market which takes place in Tinguilinta on Saturdays. According to the household surveys and as shown in *Figure 12.36*, almost 91% of households go there to buy and/or sell food and other products.

The other weekly markets which attract households from the MA, but in lesser numbers (less than a third of households) are those in Boké and Sangarédi, on Sundays.

The Tanéné and Linguéré markets were also mentioned by households as being occasionally visited.

Figure 12.36 Visits to markets by households in the MA in 2014



Achat: purchase / *Vente:* sale / *Autre:* other

Source: INSUCO

At a smaller scale, there are significant differences between both areas:

- households in the RA visit more the Tinguilinta market compared with those living in the IA (approximately 97% against 86%);
- over 73% of households across the Sangarédi Sub-Prefecture (RA and IA both taken into consideration) go to the Sangarédi market. Only 8.4%of households in the Tanéné Sub Prefecture (RA and IA) go there; and
- conversely, the Boké market is more often visited by households from the Tanéné SP (33.1%) than by those from the Sangarédi SP (2.4%).

It should be noted that visits to market vary depending on the seasons. During the rainy season, many households, especially those in the IA, do not move much or at all. They eat the produce they have stored or that they can find nearby.

There is no livestock market in the MA. The largest and closest one is located in Wendou Mbour in the Gaoual Prefecture. Livestock may however be traded in villages and *Wouro* (livestock penning areas outside the village). Buyers may come from distant locations (Sangarédi, Boké or even Kamsar) to negotiate heads of cattle.

12.2.6.2 *Market price trends in Sangarédi and Tinguilinta*

An assessment of market prices could be conducted based on the data that have been collected by GAC on weekly markets since 2011[1], notably in Sangarédi and Tinguilinta[2].

Assessing market prices consists in comparing prices of some basic commodities (cassava, banana, eggplant, pepper, tomato, etc.) available all year round, as well as their evolution between:

- the two markets in Sangarédi and Tinguilinta;
- the months in a same crop year; and
- years 2011 and 2014.

The focus was then put on the prices of rice which is the most cultivated plant in the MA and the staple food of the population, then on the prices of groundnut which is the most sought-after cash crop in the MA.

The Sangarédi and Tinguilinta markets are generally thought to be equivalent in terms of commodity prices. However, prices are not similar: it depends on the product sought and purchasing period. For example, eggplant is more expensive from May to June on the Sangarédi market and then, from October to November on the Tinguilinta market.

Market gardening products are slightly more expensive in Tinguilinta. Since they are little or not cultivated at all in the MA, such products are less common on small markets (compared to Sangarédi which attracts sellers who came from distant locations like Télimélé), and thus prices increase. Tomato is a perfect example of this trend. Its price per kilo may double in Tinguilinta compared with the price per kilo in Sangarédi.

Between 2011 and 2014, nearly all the commodity prices increased. Following a spike between 2011 and 2013 (some prices such as cassava registered a fourfold increase), prices have then tended to exhibit a downward trend since 2014. Several factors may explain such fluctuations: climate variations, political changes and their associated economic impacts, more recently Ebola epidemic, etc.

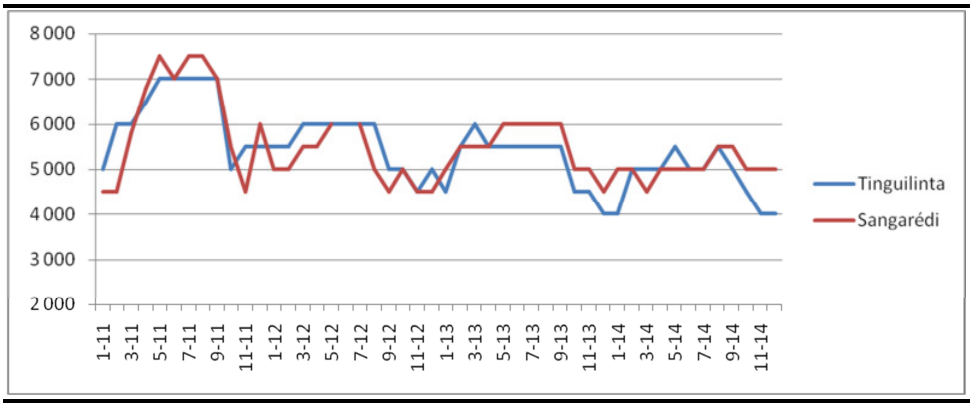
As far as rice is concerned and as shown in *Figure 12.37* below, its price has slightly decreased since 2011, from 7,000 GNF in September 2011 to 5,000 GNF in September 2014. Prices between Tinguilinta and Sangarédi are not exhibiting

[1] The data have been collected since 2009 by EGA. Only the ones since 2011 have been used in this present study.

[2] GAC also performs such monitoring on the Kamsar and Boullérè weekly markets. Since both locations are outside the mine area, the prices thus monitored were not analysed here.

significant differences. Over the past two years, the price per kilo was slightly more expensive in Sangarédi than in Tinguilinta. Rice prices mainly fluctuate over the year according to the rice cycle and its availability on the market. From October to January, rice is considered to be in overproduction. The harvest has just finished, household granaries are full and rice is easily available on markets. By contrast, during the lean season, household supplies have run out and local rice is scarce on markets. And yet it is the staple food. Prices spike to reach a peak around July-August (they may sometimes register a 20% increase) before plummeting in September-October.

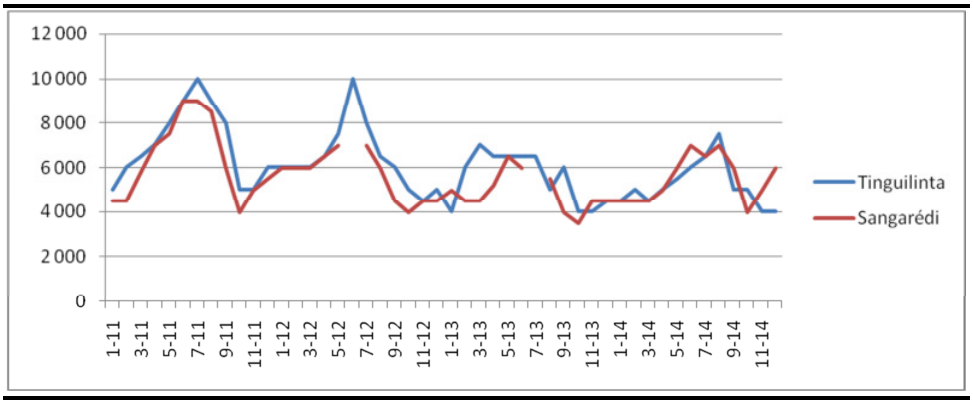
Figure 12.37 ***Rice price trends (in GNF) on the Sangarédi and Tinguilinta markets from 2011 to 2014***



On the abscissa: months from January 2011 to December 2014.
Source: GAC

Annual fluctuations in groundnut prices are more significant than for rice, since they may nearly double. They also depend on the cultivation cycle and the selling strategies adopted by households. Groundnut prices register peaks before the harvest and then collapse from the moment they are more easily available. Groundnut is not a staple food strictly speaking but rather a cash crop. It is therefore in the interest of households to keep their crops and only sell them when prices are at their highest. Likewise, there are no huge price gaps between Sangarédi and Tinguilinta.

Figure 12.38 Groundnut price trends (in GNF) on the Sangarédi and Tinguilinta markets from 2011 to 2014



On the abscissa: months from January 2011 to December 2014.
Source: GAC

12.2.7 *Electricity, telephone networks and radio waves*

12.2.7.1 *Electricity*

There is no grid in the MA. Therefore, households have no access to electricity. Less than 5% of households own a power generator and can produce electricity. The remaining households must use alternative sources to have light or cook. 92.7% use battery-operated lamps[1]and96.6% cook with firewood.

12.2.7.2 *Telecommunication networks*

Likewise, phone coverage in the MA is not very developed. The best service is provided by Orange but it is not available everywhere and reception fluctuates. Sometimes and in some places (often on the *bowé*) Areeba and Intercell may be available. In The RA, 87.6% of households own at least one mobile phone. In the IA, 78.1% do too. A same mobile phone may be used by several households or even by the whole village.

12.2.7.3 *Radios*

Several radio stations may be received in the MA: Radio Rurale, Radio RCK (CBG radio), Espace FM and Radio Bissao. Reception is however more frequent and of better quality in the RA. According to the HSs, 53.9% of households own a radio.

[1]Once they are used, batteries are discarded in the environment or burnt.

12.2.8 *Sociocultural infrastructures*

The predominant sport practiced in villages is football. Yet some villages do not have a field; when two villages are close, they may share one. As a result, 69 football fields were registered in the MA. Most fields are cleared spaces on the *bowal*.

There are two community houses in Tinguilinta and Doubhi. They were built in 2010 by GAC SA to receive young people and adults for meetings and training sessions. On Saturday nights, dances are usually organized.

Finally, several religious infrastructures, all dedicated to Islam, were recorded in the MA. Sixteen locations, among the most significant ones in terms of history, socio-demographics and administration, have mosques. Eleven locations have *Almadjadja*, i.e. small mosques that cannot officiate during Friday prayer. Most of the remaining locations have *N'Gérou*, which are simple open-air prayer areas.

Although the MA shows that Islam is predominant, it should be noted that the principles of religious freedom and interreligious tolerance are respected in Guinea.

Figure 12.39 Mosques in Sampirin Missidé and Tinguilinta



Source: INSUCO

Box 12.2 Summary of the socioeconomic background in the MA

Accessibility to the locations in the MA by car may greatly vary. In the RA, 4 locations behind the railway are cut off from the road. In the IA, 18 villages are inaccessible all year round and 19 others become so during the rainy season. Traffic on the national road is fairly light. There are on average less than 20 vehicles per hour, including 61% motorcycles and 34% cars and 4x4s/pick-up trucks.

About 80.5% of households in the RA and 95.9% in the IA are considered as owning their houses. Property commercialization is a recent trend and only concerns a limited number of roadside locations.

At the beginning of school year 2013-2014, 21 primary schools were attended by children from the MA but only 15 of them are actually in the MA. Most children have to cover distances exceeding 2 km to go to school. The enrolment rate of children aged 7-15 is estimated to be 47%, below the national average (51%). Children closed to the main road are going easier to primary school (56.3%) than children in the country side (46.3%)On another hand, enrolment concern more boys (53.2%) than girls (42.8%).
An important part of children stop school before the end of the primary cycle. Indeed, 53.8% of population does not have any diploma. At the same time, literacy in French (the official language) remains low with 19.9% for all the individuals over 7, also with difference between men (24.6%) and women (16.3%).

There are three health stations (public facilities) in the mine area. Their capacity is also very limited: there is a lack of medical equipment and medicines, the staff only includes healthcare technicians with basic training. Access to these healthcare facilities may be very difficult from the villages located far from the main dirt roads. However, public facilities however remain the prime places of consultation for 67% of households. Traditional medicine is still widespread (11% of households go to traditional healers and 48.5% use products from the pharmacy). The main pathology in the MA is malaria, 61% of the population consider they were infected by the disease in the past three months. Although most households in the MA have already heard about the HIV/AIDS and Ebola viruses, few are aware of their modes of transmission or associate them with wrong beliefs.

Twenty-six hand pumps were registered in the MA, but only 11 of them are functional and their ratio does not exceed 300 inhabitants/pump, which is considered as the acceptable limit in rural areas by the national drinking water and sanitation program (*Programme National d'Alimentation en Eau Potable et d'Assainissement - PNAEPA*). In the RA, 42.1% of households abstract drinking water from traditional wells. In the IA, 80.6% of households use surface water (rivers, springs, small swamps).

The Tinguilinta market is the only one in the MA. Some 91% of households go there to buy and/or sell their products. Prices tend to fluctuate on local markets depending on the period of the year and product availability. Rice and groundnut price hikes are observed before the harvesting period (July-August and May-July respectively).
There is no electricity grid in the area. Phone coverage is also fairly poor although most households own a mobile phone.

Sixteen mosques and 11 *almadjadja* were observed in the area. Although Islam is predominant in the MA, it should be noted that the principles of religious freedom and interreligious tolerance are respected in Guinea.

12.3 ECONOMIC ACTIVITIES

12.3.1 *Agriculture*

According to the household surveys, nearly 9 households out of 10 were involved in agriculture in 2013[1]either as a primary or secondary activity. Agriculture is by far the main economic sector in the MA.

The presentation below of the agrarian system in the MA could be prepared thanks to a thorough field survey with some twenty farmers from the villages of Dogoyombé, Gobiré, Hafia Missidé, Lopé Tambagour, Pompo Missidé and Sampirin Mamacira.

12.3.1.1 *Typology of croplands*

There are 5 types of natural areas in the MA:

- Djolol (Hillsides)[2]: hillsides are the most important cultivation areas for farmers; they offer good yields and enable crop diversity. Hillsides are cleared, then burnt and used to grow rain-fed rice and other associated crops (maize, sesame, millet, sorghum, fonio, gumbo). During the second year, hillsides are used to cultivate groundnuts. In wetter areas at the bottom of hills, a few market and perennial crops may be cultivated. Hillsides are exploited as part of cropping cycles.

- N'dantari (Bottom lands)[3]: damp silty-to-clayey soil is covered with fairly dense tree vegetation when left unexploited. When they are, bottom lands are used to plant perennial crops along watercourses (planted and spontaneous banana, lemon, orange, mango, cola, oil palm trees) and when banks are large enough, early varieties may be cultivated before water level rises (rice, millet, maize, cassava, sweet potato, etc.).

- Hounsire (Groves on flat surfaces)[4]: these areas are scattered on bauxite plateaus or on hilltops. Through animal penning, land may be fertilized and these areas may eventually be integrated to the cropping cycles of annual crops. For ten to thirty years now in the MA, these areas have also been used to plant perennial crops that do not require very fertile soil (cashew trees mainly).

[1] Since the first stage of the socioeconomic baseline study took place in July and August 2014, the data thus collected regarding activities and income during the household surveys were for 2013.

[2] Translation in Fula language *djolol / djoli* (sg. pl.). Translation in Landoma language: *tabòn*.

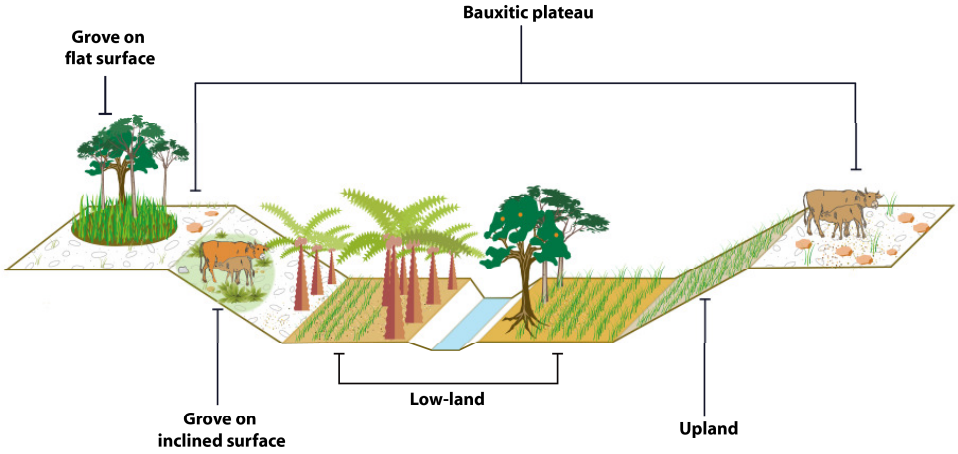
[3] Translation in Fula language; *n'dantari / dantaji* (sg. pl.). Translation in Landoma language: *dassamba* fora deep valley used to cultivate perennial crops /*amère* for flat banks used to cultivate annual crops.

[4] Translation in Fula language: *hounsiré / kounsi* (sg. pl.). Translation in Landoma language: *koumbatsé*

- Donghol (Groves on sloping surfaces)[1]: these areas are supposedly unfavorable to agriculture and are first used as grazing areas. However, the rapid development of cashew tree plantations has been increasingly expanding over these areas, thereby leading to the exclusion of animal breeding activities.

- Bowal (Bauxite plateaus)[2]: crusty soil on plateaus does not lend itself well to subsistence agriculture. By contrast, building materials may be sourced (straw, wood, stone) and herds may graze there, especially during the rainy season. On some plateaus, soil may lend itself to cashew tree cultivation.

Figure 12.40 ***Cross section of existing resource areas in the MA***



Source: INSUCO

A same plot of land may generate several resources (agricultural, pasture, wood resources, etc.). Such resources may be exploited simultaneously (harvesting spontaneous varieties and planting perennial crops in forests) or in turn (farming and cattle breeding depending on seasonal variations). Although all these areas are currently used for agricultural purposes, the *djolol* and *n'dantari* are most sought after since they are close to water resources.

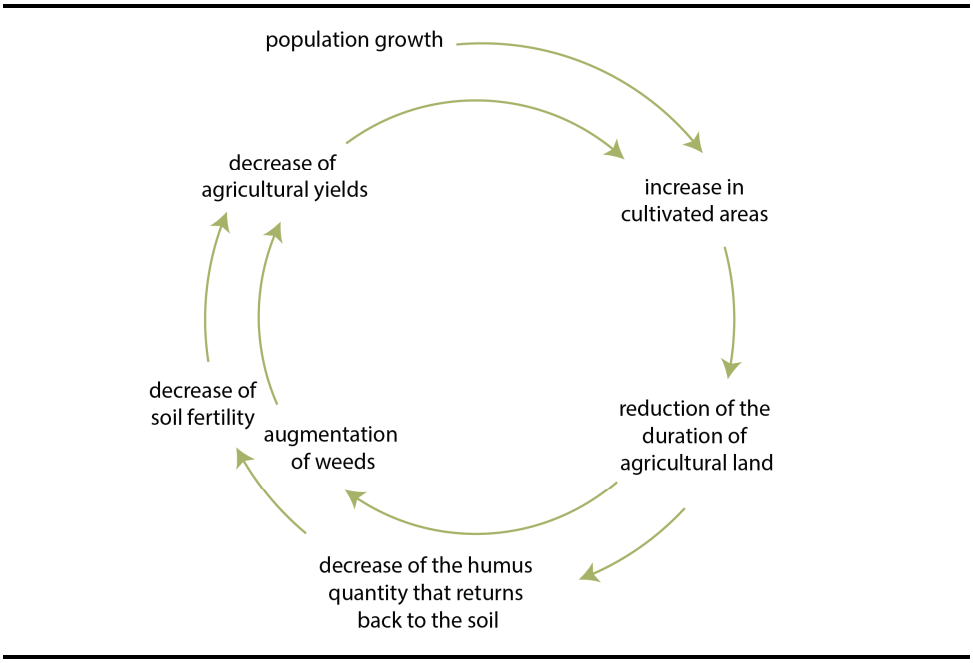
[1] Translation in Fula language: *donghol.* In the Fula territory, these areas may be used to cultivate annual crops when animal penning considerably improved soil fertility.Translation in Landoma language: *Toròn.*

[2] Translation in Fula language: *bowal / bowé* (sg. pl.). Translation in Landoma language: *koubouli.*

12.3.1.2 *Soil fertility regimes*

The main type of cultivation in the MA is slash-and-burn. Fallowing land offers the main source of fertility restoration. In the MA, the average fallow time is approximately 5 years against 7 years around ten years ago. Although this practice is applied throughout the MA, the reduction in fallow time is quicker along the road due to population growth and land pressure. The associated consequences are reduced soil quality, poorer yields and increased erosion risks, as shown in *Figure 12.41*.

Figure 12.41 Soil fertility degradation cycle



Source: INSUCO

Since animal grazing is increasingly difficult due to the land pressure and especially to the agricultural activities expansion, the associated supply of manure is decreasing and can no longer contribute to fertility restoration as effectively as it used to. Few households buy organic fertilizers to fertilize their land. The use of chemical fertilizers is also negligible. Only 1.5% of households involved in agricultural activities used some in 2013.

12.3.1.3 *Slash-and-burn cultivation*

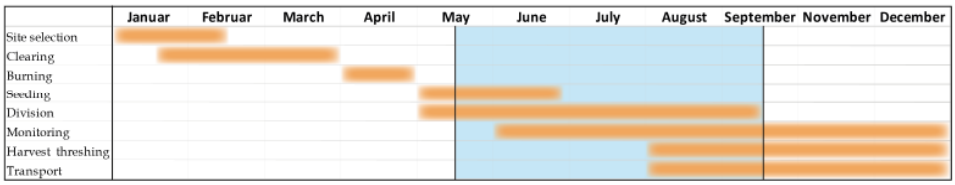
On all land types, slash-and-burn is the main technique used. It consists in selecting in given areas, plots of land that will be cultivated for one or two years before being left fallow.

Slash-and-burn agriculture is applied to rain-fed rice growing which provides the staple food of the regional population, and to secondary crops (maize, gumbo, pepper, etc.). Rain-fed rice is most often cultivated alternately with

groundnut so as to fertilize soil. These subsistence systems rely on clearing and burning a plot of land and then cultivating it before leaving it fallow for a few years, thus allowing soil regeneration. After one crop year, a farmer leaves the cultivated plot fallow and cultivates a second, then a third one the following year; until soil on the first plot is regenerated and cultivated again by the same farmer or another one.

Figure 12.42 illustrates the main stages of the slash-and-burn technique over a year: plot selection, clearing, burning, sowing, weeding, monitoring, harvesting, threshing and transport. Each stage is described in *Annex 12.3 –Further information on social report data*.

Figure 12.42 Stages of Slash-and-burn cultivation



Source: INSUCO

According to farmers, rice yields depend on the environment and rice varieties. The *N'dantari* is considered as the best place to grow rice. Then the *djolol* and *hunsiré*. Besides, *Grand Moulin*s the variety with the highest yields since it is most resistant to invasive plants (spontaneously growing within a crop and the presence of which may be more or less harmful - commonly known as weeds).

The surface area of several rice fields was measured (with a GPS) and discussions with farmers followed regarding their harvests. Average yields for 2013[1]were estimated to be around 1.5 tonne per hectare. Although such yield is deemed good compared with national average values (1.1–1.2 tonne/hectare), it greatly varies from one location to the next, notably depending on:

- the location of the village: villages in the RA suffer greater land pressure(population growth and reduced fallow time) and their yields are therefore poorer;
- the type of soil and agro-ecological conditions (pedology and climatology);and
- cultivation methods and the use of inputs.

[1]Yields were calculated based on the following formula: **Y= produced quantity/plot surface area**.

Rice is the primary crop grown by households and the staple food commonly intended for household consumption. Eighty-two percent of households who grow rice must however buy some during 2.6 months on average to cover the family's needs. Rice is usually sold out of necessity only when cash crops cannot make up for households expenses. As a result, some households sell a portion of their crops and, with the associated profits, they buy lower-quality rice for their own consumption.

Figure 12.43 Rice field in Gobiré



Source: INSUCO

As far as groundnut is concerned, yields are the highest in the *hunsiré* then *djolol*. As for rice, plot measurements were made and discussions with farmers carried out and groundnut yields for 2013 were estimated to be around 2.8 tons per hectare. Groundnut is the second crop in terms of land surface and the first cash crop. It accounts for approximately a quarter of the money income deriving from agriculture in the MA.

Around 52.3% of annual crop production is generally sold (although it is only 22.8% for rice). Selling patterns may however vary depending on the following factors:

- Period: before harvest time, retailers often order products from farmers. Products are bought based on the desired quantity at a set price. Such

products are then sold during the lean season[1]and planting season to the same villagers, but at a higher price (speculative scheme). Following harvest time, products are generally sold on 3 occasions: right after harvest, at the beginning of the school year (to cover education expenditures) and during the lean season (the most critical time for vulnerable households).

- Intermediaries: products may be sold individually or through village groups.

- Distribution channel: products may be sold within or between villages, or on the local markets (Linguéré, Tinguilinta, Sangarédi and Boké).

12.3.1.4 *Market gardening*

Market gardening is also significant in the MA, although it is quite basic. Activities are mainly carried out by women working individually or for a group. The main crops are pepper, long and round eggplants, gumbo, tomato, cassava and sweet potato.

Generally and although the crop calendar may vary from one area to the next, nurseries are organized on rice or groundnut fields during the rainy season. Between October and December, right after harvest time, women choose a small patch of land on the edge of a small swamp, clear and clean it. Soil may be enriched with several composting techniques (groundnut hay, bran ashes, rice straw or cow manure). The plot is usually fenced, regularly tended and watered morning and evening with a watering can. Products may be harvested as soon as two to three months after planting. Harvest peak occurs at the time hillside crops are planted, i.e. between May and June.

The commercialization of market garden produce is fairly well developed in the area. It accounts for over a fifth of the household income deriving from agriculture and nearly a quarter of the money income associated with annual agriculture.
As it is the case for annual crops, produce is sold within or between villages and on the main local markets.

12.3.1.5 *Perennial crops*

Perennial crops are the most common in the MA and account for 33.5% of the household money income deriving from agriculture, with, in order of importance:

- 14% for cashew tree;
- 11.4% for fruit crops (mangoes, oranges and bananas);and

[1]The lean season is the period before the first harvests when food stocks from the previous year start to run out. Thereis often a food shortage and a steep increase in prices, sometimes exacerbatedby local speculation.

- 8.1% for oil palm plantations, although most of them are sub-spontaneous plantations (i.e. growing naturally but protected during the land clearing stage).

*Table 12.8*details the main perennial crops in the MA.

Table 12.8 Plantations features

	Mango tree	Orange tree	Dwarf palm tree(not growing spontaneously)	Cashew tree
Sowing	Nursery during the rainy season then sometimes grafting	Nursery for 1 year then transplanting	Nursery for 1 to 3 years then transplanting	Direct sowing/ sometimes nursery for 1 to 3 years, then transplanting
Planting	In August on *N'dantari*	In August on *N'dantari*	In August on *N'dantari* and sometimes on *Hunsiré* or*Djolol*	In August on *N'dantari*, *Djolol* and *Doghol*
Production	After 4-5 years	After 4-5 years	After 3-4 years	After 3-4 years
Harvesting	April - July	December - January	All year with a peak between January and June	March - May
Commercializatio n	Purchasing dealer visits villages /markets	Purchasing dealer visits villages (sometimes with single tree sales) /markets	Palm oil and palm kernel oil processing. Sold on markets	On markets under an exchange system against rice bags (of an equivalent weight)
Price	Up to 4,000 GNF a bowl		Palm fruit clusters sold between 1,500 and 2,000 GNF Red palm oil sold up to 10,000 GNF a liter during the lean season	Up to 5,000 GNF/kg

Source: INSUCO

The other perennial crops are commercially important in the MA and sold in villages and on markets. The most common productions include avocados, pineapples, two varieties of lemon, grapefruit, etc.

12.3.1.6 *Mobilizationof laborers*

Beyond the family or household, laborers are organized in two different manners: *kilé* and paid laborers.

- *Kilé* is a village system of mutual help through which 5 to 10 laborers may be mobilized to work in the field when a household needs so. Although *kilé* is free, the household shall pay for workers' expenses (meals, cigarettes, etc.).

- Paid labor is common to all villages and generally involves young people and adults, whether they come from the village or not. As a result, some people go from village to village looking for a job during the crop season. Farmers may need outside laborers for various cultivation stages (see *Annex 12.3 –Further Information on social report data*), except for burning and field monitoring that are carried out within the family.

Figure 12.44 Kilé in Sorontoré



Source: INSUCO

Labor prices are virtually the same from one crop to the next. They however vary between the distinct cultivation stages, as shown in *Table 12.9*.

Table 12.9 Average labor prices (in GNF)

Annual crops		Perennial crops	
Land clearing	*25,000 to 30,000 GNF/pers/day*	Land clearing	*25,000 to 30,000 GNF/pers/day*
Rice planting	*25,000 to 30,000 GNF/pers/day*	Harvesting	*Variable*
Groundnut sowing	*5,000 GNF/pers/kilo sown*	Palm harvesting	*1,500 GNF/harvested cluster*
Weeding	*20,000 to 30,000 GNF/pers/day*		
Groundnut harvesting	*Variable*		
Rice harvesting	*1/5 to 1/10 harvested bundles*		
Rice threshing	*1 metal vessel ("estagnon*")of rice/day*		
Transport	*1/10 bags transported*		

* *Metal vessel used for oil or petrol.*
Source: INSUCO

On the whole, land clearing, sowing and weeding for annual crops and land clearing and harvesting for perennial crops are paid in cash. In some places, such as Hafia Missidé, women are paid less than men for the same activity (e.g. land clearing is paid 15,000 GNF/day for women and 25,000 GNF/day for men).

Harvesting, threshing and transport are paid in kind, for both annual and perennial crops. Day laborers earn a bundle of rice every5to 10 bundles. In-kind compensation for groundnut crops and perennial crops is more variable. It depends on the size of the plot, current production and intermediaries. The individual buying the production indeed often comes to harvest himself, based on the agreement with the farmer.

Still according to the discussions with farmers from the 6 villages, total production costs could be estimated for annual crops by field type (rice and groundnut). It should be noted here that production costs depend on many factors such as the size of the plot, available unpaid workers (usually family members), the use of agricultural inputs, etc. The data in *Table 12.10* below are provided as a reference only, to show the trends in the MA.

Table 12.10 Estimated production costs per hectare for rice and groundnut

	Rice			Groundnut		
	MD	**Unit cost (GNF)**	**Total cost (GNF)**	**Units**	**Unit cost (GNF)**	**Total cost (GNF)**
Land clearing	8.2	27,500	225,500	7.4	27,500	203,500
Sowing	6.2	27,500	170,500	6.5	27,500	179,259
Weeding	6.3	25,000	157,500	22.2	25,000	555,000
Harvesting*	2.2	20,000	44,000	5.5	20,000	109,191
Threshing and transport *	9.1	15,000	136,500	4.8	15,000	72,000
Total/GNF			**734,000**			**1,118,951**

*Unit costs were converted into GNF
MD: Man-day
Source: INSUCO

Production costs are generally higher for groundnut than for rice. Such difference may be due to the fact that harvesting and weeding require more labor per hectare. Besides, since groundnut is a cash crop, sales price speculation also has a repercussion on labor costs. Unit costs for the activities associated with groundnut cultivation have therefore tended to increase over the past few years.

12.3.2 *Animal breeding*

12.3.2.1 *Cattle breeding*

In the mine area, pastoralism is the traditional activity and cattle breeding is widespread. According to the household surveys, approximately 21.4% of households own cattle, including small owners who are not livestock breeders. Households own on average 5.5 cattle heads. It should be noted that more households own cattle in the Sangarédi Sub-Prefecture compared with those in the Tanéné Sub-Prefecture (41.2% against 11.3%) and their herds are also larger (9.7 against 3.3 heads). The Sangarédi Sub-Prefecture is mainly populated with Fula people who are traditionally involved in cattle breeding while few Landoma households are involved in this activity.

Only 1.6% of cattle-breeding households conduct this activity as their primary one.

The MA offers great potential in terms of pastures and has become an area favored by transhumant herders. Livestock and pastures are present everywhere, irrespective of the season. The river Tinguilinta is no obstacle to transhumance. Herds cross it through the bridge between Doubhi and Tinguilinta.

Two types of transhumance may be observed:

- Short-distance transhumance consisting in moving village herds according to the growing season (to avoid large crops during the rainy season and market gardening areas during the dry season). It takes place between neighboring village territories. For example, the pastures in Wossou or the area extending from Dogoyombé to Missidé Höré Wendou may be mentioned.

- Long-distance transhumance involves men with large herds, whether they come from the MA or not. It takes place during the dry season. In the MA, long-distance transhumance takes on two forms. Some herdsmen may cover long distances (e.g. between the Télimélé and Boffa areas) and only cross the MA. On the other hand, some others, often from neighboring regions, settle in the MA throughout the rainy season. Although their presence is temporary, they come back every year. Six temporary settlements were geotagged in the Tanéné Sub-Prefecture[1].Conversely, some herdsmen from the MA such as in Dogoyombé, leave the MA to go to the south of the Boké Prefecture or toward Boffa.

During transhumance, small breeders (2 to 4 cattle heads) leave their animals to large breeders (for whom it is their primary activity) who will be in charge of

[1] These settlements were identified during the scoping stage. Since they were empty, they could not be assessed during the socioeconomic baseline study.

watching and grazing. Small breeders may therefore dedicate themselves to their primary activity (farming mainly) and do not have to manage their animals.

Figure 12.45 Herd between Kériré and Sorontooun Dow



Source: INSUCO

During both short and long-distance movement of cattle, the cattle are systematically penned at night. Penning areas however differ depending on the time of year:

- *sedhougol* during the dry season. Cattle are penned on *n'dantari*, wet bottom lands, usually close to a watercourse; and

- *roumougol* during the rainy season. Since *n'dantari*is deemed too wet, cattle are penned on higher areas called *doghol*. A woodenstructure is generally built.

Irrespective of this, the penning area and settlement are always called *wouro* in Fula language. Before settling, non-natives turn to the officials of the villages owning the land to obtain their authorization.

12.3.2.2 *Conflicts between herdsmen and farmers*

Authorization to settle in an area is not subject to any compensation; however it prevents potential conflicts with local farmers. For example, in the village of Pompo Missidé, herdsmen are no longer allowed to settle on its land, following many problems in the past and in order to protect their croplands and plantations.

There are indeed conflicts between farmers and herdsmen in the MA. They arise both during the dry season because of market gardening plots and during the rainy season regarding large annual crops. In most cases, when a crop is damaged by cattle, its owner must pay steep, sometimes excessive fines. Given the regular lack of management committees in villages, conflicts are managed by local officials (heads of sectors, heads of districts and elders) or referred to the department in charge of development issues at the Sub-Prefecture level when no agreement is reached. It should be noted that cattle theft is widespread in the area.

Breeders are responsible for caring for their animals since technical departments have not performed vaccination campaigns for several years now. When animals are sick, breeders treat them by buying medicines in private veterinary clinics (in Boké or Conakry).

12.3.2.3 *Milk production*

It should also be noted that all cattle owners produce milk (in quantities that may vary from one owner to the next depending on herd sizes). Cows are milked in the morning by women only. Milk is more plentiful during the rainy season (a young cow may produce 1 to 2 liters of milk per day) than during the dry season (0.5 to 1 liter). Except for a small quantity kept for family consumption, most part of the milk production is sold on markets.

12.3.2.4 *Small ruminants*

In the MA, almost 7 households out of 10 own small ruminants, either goats or sheep, with 9 heads on average. These species are rustic and therefore well adapted to local conditions. During the dry season, animals are left free to wander during the day and spend the night in shelters built for that purpose. During the rainy season, which is the growing season, they are watched by their owners in order to prevent them from destroying fields.

Small ruminants are usually considered as capital to be used should the need arise, in times of hardship or during celebrations. They are genuine "bank accounts" for households who can save fairly large sums without resorting to a money saving system. As a result, a small number of them are sold (35.9% of sales and only 1.1 animal sold per household in 2013) or eaten. Villagers keep them and sacrifice a few for celebrations. Furthermore, 65.9% of households vaccinate their animals in order to prevent potential epidemics.

Besides, this practice requires little investment: feeding cost is low and veterinary expenses usually cheap. A household owning small ruminants spends approximately 41,000 GNF (5.6 USD) per year.

12.3.2.5 *Poultry*

Poultry husbandry is a common practice involving 93.5% of households, even for small-scale activities, with 19.6 heads per household on average. For some families, it may represent a significant source of proteins. Poultry can be sold on markets more easily and accounts for a non-negligible source of cash income.

12.3.2.6 *Beekeeping*

Traditional beekeeping in the area accounts for 9.2% of households. Honey is intended for family consumption and sold on weekly markets.

There are currently no bee yards, harvest is ensured by wild swarming bees. In 2010, GAC SA supported a small-scale beekeeping project with some twenty beekeepers in the Boullérè District, giving them Kenyan beehives and other equipment (coveralls and masks) and providing some technical training.

12.3.3 ***Use of natural resources***

12.3.3.1 *Hunting*

Involving men only, hunting is a traditional activity in the area. However, it is increasingly abandoned due to depleting game numbers because of pressure on resources (associated with population growth), and awareness campaigns aiming at curbing the activity.

Target animals mainly include small rodents. Some additional species are also hunted such as does and monkeys. For some species, hunting is banned or limited in time by current legislations, but it seems these legal requirements are not respected.

Twenty-three percent of households include at least one member who occasionally hunts in the MA. Nearly 50% of products deriving from hunting activities are sold. The remaining part is intended for household consumption.

12.3.3.2 *Fishing*

Fishing is practiced unevenly in the MA. It mainly involves people living close to one or several watercourses. Men fish during the rainy season while both men and women do so during the dry season. This is actually subsistence fishing where 76.3% of fish caught is intended for consumption. Profits are small and estimated to be 150,000 GNF per year and per household (20.6 USD).

Figure 12.46 Fishing activities in the Tinguilinta



Source: ERM

The fishing techniques identified in the MA include:

- *ndolin* or hook-and-lien fishing;
- *hoggo*, which means fence in Fula language, is a technique consisting in installing a barrier made of palm wood and branches in small swamps;
- *diala* or gillnetting, especially in small swamps (techniques may vary between the dry season and wintering season); and
- *dougoumet* consisting in tying and horizontally putting in water canon-shaped baskets. Fish enter these baskets in the same direction as the water current and are thus trapped and caught.

Figure 12.47 Dougoumet used in the study area



Source: ERM

12.3.3.3 *Gathering, firewood and charcoal production*

Harvesting is common across the MA although it does not represent a significant source of income for households. Depending on the season, harvesting may be a fairly good source of food (mineral salts and vitamins), when different wild berries and fruit from spontaneous crops are eaten by households on a daily basis.

Néré is processed into *soumbara* (cooking paste widely used in Guinea) and then intended for personal consumption or sold on markets.

Firewood harvesting and cutting is common in the MA, involving 88.7% of households. Firewood is first intended for personal use. Out of an average of 268 bundles collected per household on 2013, only 8.2% were sold. Firewood trading is however on the rise along the road (14.1%). The close distance to Sangarédi, where energy demand is high, encourages households to sell their production.

Although harvesting wood for making charcoal used to target a few varieties, due to the scarcity of tall trees, all the varieties are now targeted. In theory, people involved in charcoal production activities must obtain a written authorization issued by the forestry management authorities to be allowed access to wood. However, few people comply with this requirement. Wood is often unduly cut in the few forests and fallow lands of the different villages.

Wood is generally burnt into charcoal by 10.8% or households, mainly in the RA. Eighty-one percent of them sell a share of their production. Associated income is estimated to be around 120,000 GNF (16.1 USD) per household and per year.

12.3.3.4 *Timber*

Due to a strong pressure from human activities, timber resources are increasingly scarce in villages. Only 3.5% of households harvest some. Nearly all the timber harvested in the area is transported to Sangarédi.

As opposed to firewood, timber harvesting is regulated and enforced. People require authorization from the forestry management authorities and at the site location, before beginning work, local officials also have to authorize the activity. Trees may be exploited upon requests from villages or forestry operators calling on villagers.

12.3.4 ***Other activities***

12.3.4.1 *Crafts, trade and transportation*

In the IA, only 0.7% of individuals consider crafts as their primary activity and11.5% as a secondary one. Crafts mainly include the textile industry (tailors, dressmakers or dyers), construction works (brick makers, carpenters, bricklayers) and joinery.

Crafts are more diversified close to the road. As a result, people involved in catering and associated trades (restaurant managers/owners, bakers, etc.), mechanics, electricians or electronic repairmen may be encountered. In the RA, 3.4% of households consider crafts as their primary activity and 8.6%as their secondary activity.

Petty trading is the primary activity for 2.5% of individuals in the RA and 0.6% in the IA. Petty trade is mainly a supplementary activity to provide the household with minor extra income.

Petty trade may be conducted in three different manners:

- on tables set in front of houses, as it is the case in the places located close to the asphalt road or main inland tracks: fruit and vegetables are mainly sold;
- in small groceries in the main towns like Tinguilinta, Boundou Lengué or Soucka: imported basic products may be sold there; and
- in markets visited by inhabitants from the MA (see *Chapter12.2.6*): Tinguilinta, Linguéré (outside the MA) and Sangarédi (outside the MA).

The transport sector mainly includes taxi or motorcycle-taxi services (the latter is individual and informal). This sector is not very developed yet in the MA (less than 1%), however households take advantage of this opportunity to earn some extra income. As a result, many households living along the road include at least one member involved in the transport sector a few weeks a year.

12.3.4.2 *Other self-employed and employed professional activities*

Several liberal professions were identified in the mine area, yet prevailing in the RA. They concern at first medical and educational sectors.

Indeed several individuals practice traditional medicine. This activity is not necessarily a significant source of money income but it gives a high social status to practitioners. Modern medicine is also represented in the MA, either informally (healers or travelling pharmacists) or formally (healthcare technicians, nurses, etc.), with the latter category consisting of public sector employees. Self-employed activities include primary school teachers, griots (historians/storytellers/singers/poets), etc.

12.3.4.3 *Mining industry*

The largest employers in the private sector are mining companies. The proportion of individuals working in this sector is currently very small (0.5%in the MA but with differences depending on the area to be considered: 1% in the RA and 0.1% in the IA).

GAC is still conducting its exploration phase. The number of unskilled jobs is limited. Besides, it has so far favored neighboring populations living in the northern part of its concession area as the original project was planned to be in the North of the Concession. It is only quite recently that it has shifted to the South. This explains why villages from the North were first involved.

CBG, which has been operating for several decades, employs people mainly from Sangarédi (notably in workers housing estates) or in the vicinity.

It should be noted that artisanal mining operation is not important in the MA. Only few people work sand, gravel, rubble stone and brick earth in a traditional fashion.

12.3.4.4 *Key industry figures*

There are several mining concessions in the Boké Prefecture, all targeting bauxite extraction and export. CBG is currently the only company in its operation phase. In order to understand current issues and assess future impacts (cumulative to all the projects), the key mining figures neighboring the MA include:

- CBG: the company has been mining bauxite since 1973 (convention signed in 1963). The area currently mined covers the Ndangara and Boundou Wandé plateaus, which are very close to the eastern part of the MA. Annual production is nearly 14 million tonnes. Bauxite is transported by rail to Kamsar, then shipped once crushed and dried. CBG employs approximately 5,000 people. Its activities in Sangarédi and Kamsar are the main economic drivers in the region. As a result, it attracts many migrants looking for a job or an opportunity to develop their businesses attending to workers and their families.

- Rusal (Cobad): the company is located in the Commune of Sangarédi. Bauxite mining has not started yet and the project location was still being assessed and the time of the survey.

- Henna Chine: located to the south-east of the MA, in the Balandougou District. It is also present in the Télimélé Sub-Prefecture. Bauxite mining has not started yet and the project location is still being assessed.

- Kabata: still at the design phase, is located north of Kamsar and proposes refining bauxite into alumina.

- AMC: proposes extracting bauxite in the Gaoual Prefecture. The AMC concession area is therefore quite distant from the MA. However, it wants to build a road as well as a railway that will pass in the North-West corner of GAC's concession to join the ANAIM existing railway North of Tanéné.

Box 12.3 Summary of the economic activities in the MA

Nearly 9 households out of 10 were involved in agriculture in 2013, either as a primary or secondary activity.

Although all these areas are currently used for agricultural purposes, the *djolol* (hillsides) and *n'dantari* (bottom lands) are most sought after for agriculture since they are close to water resources.

Slash-and-burn cultivation is most common. The fallow time required to restore soil fertility has however been decreasing for the last 10 years (from 7 to 5 years due to population growth and land pressure.
Rice is the main production for households in the area. It is also the staple food, generally intended for personal consumption. Nearly 81.9% of households who grow rice must buy some during at least 2.6 months to cover family needs.

The other farming activities conducted in the area include:

- groundnut cultivation which is the second crop in terms of land occupation and first cash crop;
- market farming which is quite rudimentary; and
- perennial crop cultivation like cashew trees which is fledgling.

Beyond the family or household, laborers are organized in two different manners: kilé (support group for specific tasks) and paid laborers.

In the mine area, pastoralism is the traditional activity and cattle breeding is widespread. According to the household surveys, approximately 21.4% of households own cattle (on average 5.5 heads/household), including small owners who are not livestock breeders. Only 1.6% of households are involved in cattle breeding as a primary activity. The MA offers great potential in terms of pastures and has become an area favored by transhumant herdsmen during both seasons. Conflicts between farmers and herdsmen are quiet common.

In the MA, almost 7 households out of 10 own small ruminants, either goats or sheep, with 9 heads on average. These species, which are rustic and therefore well adapted to local conditions, are genuine "bank accounts" for households who can save fairly large sums without resorting to a money saving system.

The use of natural resources is common in the area. It includes hunting, fishing, gathering as well as firewood harvesting and cutting, etc. These activities are first intended for household consumption. Few products are sold.

The other activities identified in the area including crafts, trade, transport, etc., are far less common in the area. They are mainly secondary activities carried out by households to earn some extra income.

The share of individuals working in the mining sector is currently very small (0.5%). The households working for a mining company mainly live in the RA (1% against 0.1% in the IA).

12.4 HOUSEHOLD STRATEGIES AND LIVELIHOODS

12.4.1 *Preamble*

The figures used in this section are derived from the household survey performed in the MA and estimated average income per household and consumption unit established based on surveydata (the consumption unit was calculated with the Oxford Indices[1] which takes into account the number of individuals and their ages).

Three types of income are mentioned in this section:

- monetary income;
- non-monetary income which accounts for the share of the household production intended for self-consumption. Non-monetary income was valued based on the associated prices registered on local markets in July-August 2014; and
- total income which includes both monetary and non-monetary income.

The values reported in this section are in Guinean Francs (GNF) and US Dollars (USD). Values were converted on 3 March 2015, based on the rate of 1 USD = 7 268.1316 GNF[2].

12.4.2 *Economic profile of households*

12.4.2.1 *Primary activity and Combinations of activity*

It should be reminded that the questions regarding the activities conducted were only asked to individuals aged over 7 years old.

Among the population over 7 years of age, 35.6% are non-working people. This category includes school children as well as students and apprentices[3] (22.8%), elderly people (2.4%) or people not working for any other reason (housewives, disabled people, etc.) (10.4%). In the former case, there are more schoolchildren and apprentices whereas in the latter case, there are almost as many people without any activity as schoolchildren and apprentices. The non-working population is different between the RA and IA. Indeed, non-working population is mainly composed of schoolchildren and apprentices in the RA whereas in the

[1] Université Oxford. 2013. http://www.ophi.org.uk/policy/multidimensional-poverty-index/ . Date of access: August 2014 then February 2015.

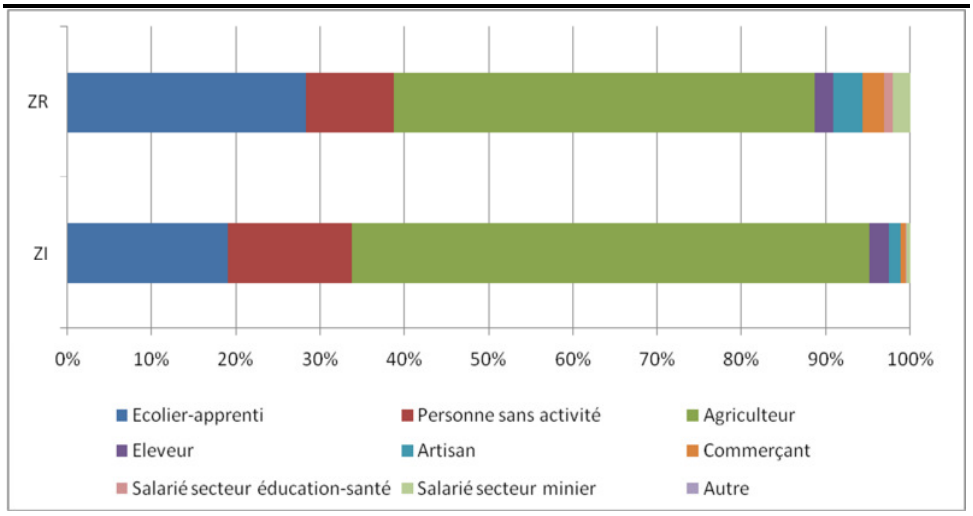
[2]Central Bank of the Republic of Guinea http://www.bcrg-guinee.org/.http://www.bcrg-guinee.org/ Date if access: August 2014 then February 2015

[3] In the MA, apprentices are not paid.

IA there in the same proportion schoolchildren, apprentices or people not working for any other reason.

Figure 12.48 shows the range of primary activities declared by households in the RA and IA.

Figure 12.48 Primary activities of households in the Road Area (RA) and Inland Area (IA)



*Ecolier-apprenti:*working pupil / *Personnes sans activité:* persons without employment / *Agriculteur : Farmer* / Eleveur : breeder / *Artisan* : artisan / *Commerçant* : merchant / *Salarié secteur éducation-santé :* employee in the education and health sector / *Salarié secteur minier:* employee in the mining sector / *Autre:* other

Source: INSUCO

The range of activities is more diversified and a little better distributed in the RA compared with the IA. As a matter of fact, only 50% of households declare agriculture as their primary activity in the RA, against 61.3%in the IA. The other households are also craftsmen (3.4%), shopkeepers (2.5%) or work in other sectors such as taxi drivers, griots, self-employed workers, etc., (7%).

Households employing a combination of livelihood activities are widespread in Guinea. By employing income diversification strategies, households reduce risk and may earn more money income and/or production gains, there by contributing to the improvement in their living conditions. Types of activities depend on the opportunities offered to households and individuals (resources, market demand, etc.) and their abilities (investment, labor, social status, etc.) to adjust, in connection with their level of access to these resources.

According to the household surveys, 68.4% of households in the RA undertake several activities[1]. This trend applies more to men than women, the latter having

[1]As opposed to standard methods, an approach to pluriactivity based on the allocation of working hours rather than only on a simple income hierarchy was used. This method considers production activities as much as income-earning and social activities.

to take care of household chores. A household may have more than 3 activities, although they are most often in the primary sector.

These activities may be:

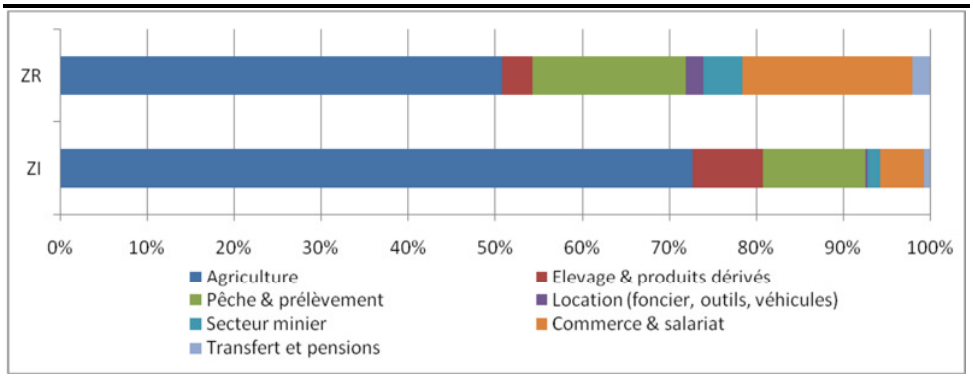
- seasonal, with one activity following another throughout the year (e.g. for people in agriculture and another activity following harvests);
- weekly: women go to sell their products on local weekly markets, like Tinguilinta and/or Sangarédi; or
- cumulative in the course of a same day: field works followed by petty trading.

12.4.2.2 *Distribution of total household incomes by sector*

Through the assessment of the total income structure, the economic background in the MA may be better understood. Non-monetary income corresponding to self-consumption was valued when calculating incomes as shown herein (unless specified otherwise). Furthermore, in order to facilitate data review, income items were grouped.

On the whole, the distribution of household incomes partially follows the distribution of household activities. *Figure 12.49* shows the distribution of household incomes for the RA and IA by sector.

Figure 12.49 Distribution of household incomes by sector in the Road Area (RA) and Inland Area (IA)



Agriculture: agriculture / *Elevage & produits dérivés:* breeding & derived products / *Pêche & prélèvement:* fishing & sampling / *Location (foncier, outils, véhicules):* rental (property, tools, vehicles) / *Secteur minier:* mining sector / *Commerce & salariat:* commerce & workforce / *Transfert et pensions:* transfer and pensions

Source: INSUCO

In the RA, agriculture accounts for half of the total income of households. Trade and employed activities (either public or private) are also a reasonable source of

income accounting for 19.6%of total resources. The mining industry (companies and subcontractors) accounts for 4.4% of the total income of households in this area. And yet, it is the primary activity of only 1% of households. In other words, although this industry currently employs few people in the MA, its financial contribution is significant for some households in the RA. Wages are higher compared with other business sectors.

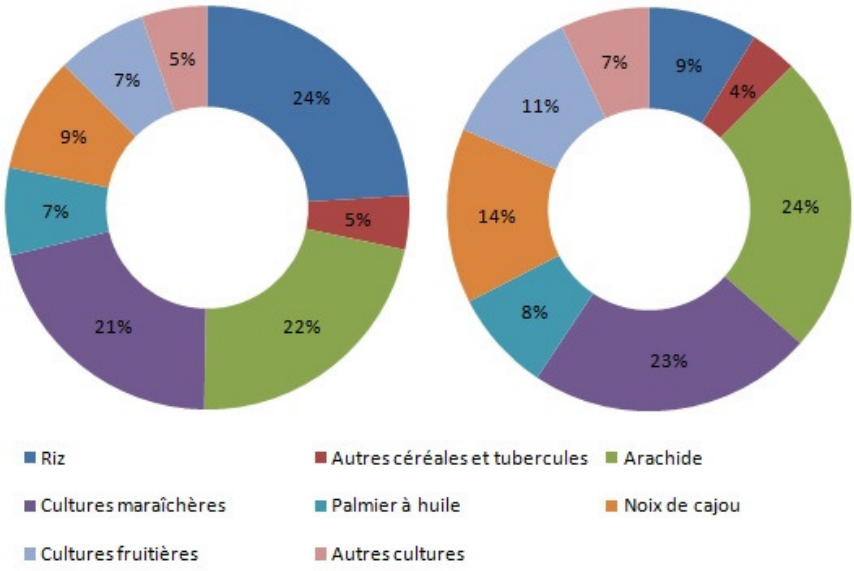
12.4.2.3 *Share of agriculture in total incomes*

Agriculture accounts for 65.6% of the total income of households across the mine area (MA), yet with a sharp contrast between the IA (72.7%) and RA (50.8%).

Annual agriculture is currently the primary resource for households since it accounts for 58%of total incomes deriving from agriculture. A third of total incomescoming from annual agriculture are related to rice cultivation and the remainder includes the production of groundnut, other cereals and tubers and market crops. Perennial crops account for 42% of total incomes deriving from agriculture; they have been sharply increasing for a few years (time required for current plantations to become productive).

Although agriculture accounts for a significant share of total household incomes, it is necessary to differentiate the income valued as part of self-consumption (i.e. non-monetary incomes) from monetary income. *Figure 12.50* highlights the main differences between both types of income for the various productions.

Figure 12.50 Relative importance of crops in total incomes (to the left) and money-incomes (to the right)



Riz: rice / *Autres céréales et tubercules*: other cereals and tubers / *Arachide :* peanut / *Cultures maraîchères :* vegetable cultures/ *Palmier à huile* : palm oil / *Noix de cajou* : cashew nuts / *Cultures fruitières :* fruit cultures / *Autres cultures* : other cultures

Source: INSUCO

Rice accounts for 24% of total household incomes but only 8.7% of money-income. Rice is intended for self-consumption. It is usually sold when households no longer have enough financial resources to cover their needs (even though the household has to buy rice a few months later)[1]or in case of production surpluses. Market crops account for a larger share of household incomes (total and money-income).

The differences between income types are also observed for the other activities in the primary sector. Animal breeding accounts for 6.5% of total household incomes but 8.5% of their money-income. A share of the produce (milk, eggs and honey) is sold. By contrast, the use of natural resources accounts for 13.7% of total household incomes but only 4% of their monetary-income. These resources are not sold, but directly used by households.

12.4.2.4 *Other sources of income*

Few households in the MA have access to the formal banking system. Almost no household has a bank account or has taken out a loan with a commercial bank. The closest bank is located in Sangarédi.

Households usually turn to members of their extended families or relatives should the need arise. In 2013, 18.1%received a money transfer, corresponding on average to a contribution of approximately 60,000 GNF (8.6 USD) per household and per month. Money transfers serve many purposes: food, education, donations for special events, etc. About a third of money transfers are sent from abroad while the remainder comes from Guinea (often from a household member who left to work in urban centers like Kamsar or Conakry).

Furthermore, in the MA as everywhere else in Guinea, there are a certain number of social and economic systems of mutual support. Most of the households involved in farming activities include at least one individual who belongs to a support group, as explained in *Section 12.6.3.*

12.4.3 ***Household wealth***

The level of wealth relies on the cross-analysis of the following aspects:

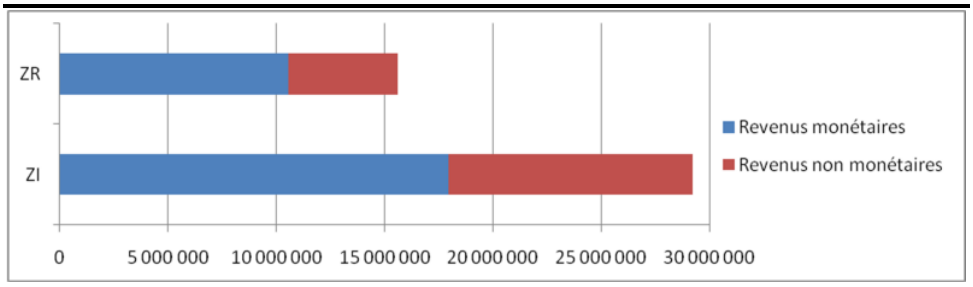
- level of income and the share of money income per consumption unit;
- housing quality composite index; and
- durable goods composite index.

[1] This trend is due to the difficulty for a household to manage its cash flow over a year. The period just before rice harvesting (lean season) is a critical period for the most vulnerable households.

12.4.3.1 *Household income levels*

All the incomes, whether money or non-monetary (valued share of self-consumption), were analyzed so as to assess the average annual income of households. As shown in *Figure 12.51* and *Table 12.11* , there is a gap between the RA and IA.

Figure 12.51 Annual income levels of households GNF) in the Road Area (RA) and Inland Area (IA)



Revenus monétaires: monetary income / *Revenus non monétaires:* non-monetary income

Source: INSUCO

Table 12.11 Details of annual incomes between the Road Area (RA) and the Inland Area (IA)

	Total incomes (GNF/Year)	Money incomes (GNF/Year)
RA	15 600 000 (i.e. 2,146.6USD)	10 600 000 (i.e. 1,458.4 USD)
IA	29 200 000 (i.e. 4,017.5 USD)	18 000 000 (i.e. 2,476.6 USD)

Source: INSUCO

On the whole, households in the IA have an average total annual income twice as high as households living in the RA. In a context where agriculture remains the primary activity for most households, this trend is due to the different conditions of access to land. Given the urbanization process which results in land pressure, households in the RA do not have access to many croplands and the croplands they can access have generally poorer yields (see *Section 12.3.1*).This trend leads to two major consequences:

- households produce less. The share intended for self-consumption is reduced, hence fewer non-monetary incomes; and
- households scarcely sell their crops, hence less money incomes as well.

In the IA, households actually have enough croplands to work in agriculture, eat a fair share of their crops and even sell surpluses.

When relating the average total annual income (both money and non-monetary income) to a *Consumption Unit* (CU)[1], the average annual income is estimated to be 5 million GNF/CU (i.e. 687.90 USD) in the RA and 7.5 million GNF in the IA (i.e. approximately 1,031.90 USD).

With such income levels, it is hard for households in the mine area to implement medium-to-long-term accumulation or developing investment strategies.

Household incomes instead of living standards (which include expenditures) were reviewed. It is hard for a household to list and value all its expenditures over a year. Results would have been too uncertain for a reliable analysis. However, such as for income levels, living standards vary in the study area (MA). Households living along the road incur more expenditure.

12.4.3.2 *Wealth indicators*

The housing quality composite index (*Indice Synthétique de Qualité de l'Habitat- ISQH*) gives information on the quality of the walls, roofs and floors of houses. It strongly depends on the money income of households. The more a house is built using "modern" materials (concrete walls, tin roof, tiled floor), the more it is indicative of significant wealth. Conversely, traditional huts (adobe walls, thatched roof, beaten earth floor) reveal that households have limited financial resources they can invest in their house. Such an indicator also relies on the principle of valuation (calculation method detailed in *Section 12.8.2).*

Similarly, the durable goods composite index (*Indice Synthétique des Biens d'Equipement- ISBE*) gives information on the investment capacity of households to improve their level of comfort. The most significant equipment was only used: radio, phone, TV set, bicycle, foam mattress, motorcycle, power generator and car. Valuations were based on the prices of locally-sourced goods which depend on their availability, gaps between supply and demand, living standards of the households in the area, etc. This indicator also relies on the principle of valuation (calculation method detailed in *Section 12.8.2).*

12.4.3.3 *Wealth levels in the area*

Wealth levels must be considered based on several criteria, namely: money income, housing quality composite index and durable goods composite index. *Table 12.12* summarizes such data for the mine area (MA).

[1] According to the Oxford scale, a head of household is equivalent to 1 CU, another adult to 0.7 CU and a child under 15 to 0.5 CU.

Table 12.12 Household wealth levels in the MA

	Daily household money income in USD[1]	Housing quality composite index	Durable goods composite index
RA	3.9	1.65	3.07
IA	6.8	1.49	2.39
MA	5.4	1.56	2.74

Source: INSUCO

These indicators confirm that wealth levels may vary based on the indicators taken into account. Housing is of better quality in the RA, durable goods are more common and more accessible. However, the average daily money income per inhabitant is higher in the IA. As mentioned above, in spite of the booming urbanization, households are still mainly involved in agriculture. By contrast, along the road, because of land pressure, it is impossible to have access to enough croplands to secure comparable income levels.

People in the RA live on average with 1.4 USD PPP/day/inhabitant, against 2.3USD PPP/day/inhabitant in the IA (2013 rate)[2]. People in the MA are barely above the poverty line of 1.25 USD PPP set by the World Bank[3]. They are however below the national average since the average daily income in Guinea is estimated to be approximately 3 USD PPP in 2013 by the World Bank[4].

It should be noted that there are huge wealth gaps among households in the MA. As shown in the RA, three quarters of households earn an average annual income not exceeding 15 million GNF, against less than half of households in the IA. As a matter of fact in the IA, there are greater income disparities between households. For example, 3% have an annual income exceeding 100,000,000 GNF (i.e. nearly 13,758.7 USD/year). These gaps may be due to many factors (greater initial financial contribution, large land owner, significant farming production, diversification of activities and incomes within the household, etc.). However, they do not accurately explain such trend.

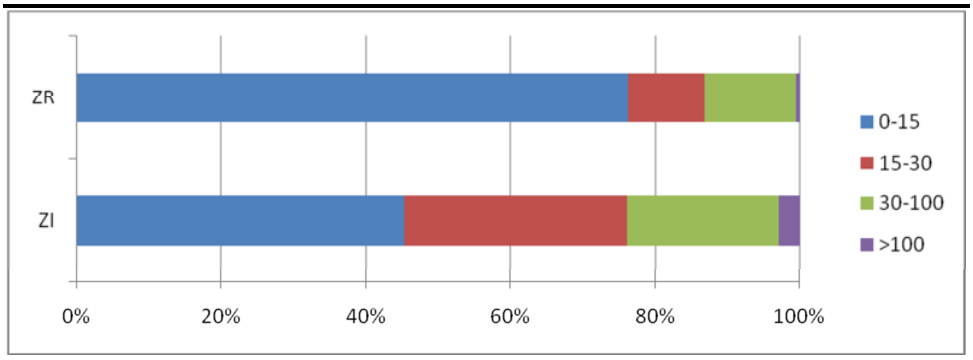
1Central Bank of the Republic of Guinea, http://www.bcrg-guinee.org/.http://www.bcrg-guinee.org/.Date of access

[2] The 2013 conversion rate into USD PPP is equivalent to 2.38.

[3] http://donnees.banquemondiale.org/indicateur/SI.POV.GAPSDate of access: August 2014 then February 2015.

[4] http://donnees.banquemondiale.org/indicateur/SI.POV.GAPS. Date of access: August 2014 then February 2015.

Figure 12.52 Distribution of households by income levels (in million GNF) in the Road Area (RA) and Inland Area (IA)



ZR: Road area; ZI: Inland area
Source: INSUCO

Box 12.4 Summary of household strategies and livelihoods in the MA

The population aged over 7years old in the area includes 35.6% of non-working people (including schoolchildren and apprentices).

Agriculture is the most common activity in the area even though the range of activities in the RA is more diversified (crafts, trade, employed activities, etc.). Besides, 68.4% of households in the area undertake several activities.

On the whole, income distribution partially follows that of household activities. All the activities in the primary sector account for more than 90% of total incomes (including self-consumption which is valued here) of households in the IA and over 70% in the RA, with agriculture still as the primary source of income.

Households in the RA generally have an average total annual income twice as low as those living in the IA (15.6 million and 29.2 million GNF respectively). In a context where agriculture remains the primary activity for most households, such trend is due to different conditions of access to land.

People living in the RA live on average with 1.4 USD PPP/day/inhabitants against 2.3 USD PPP/day/inhabitant in the IA (2013 rate), which is below the national average estimated to be 3 USD PPP in 2013 by the World Bank.

12.5 LAND TENURE

12.5.1 *Guinean land tenure legislation*

Land tenure is regulated by the Land Tenure Code (*Code Foncier et Domanial - CFD*) adopted in 1992[1], which is the reference legal framework. Its objective is to restore private property which was abolished during the First Republic[2]. In addition to breaking the State monopoly, the 1992 Code aims to favor tenure security (by formalizing property rights and adopting decrees facilitating property commercialization[3]), so as to favor productive investment.

With these new tools, the State still rules the land tenure system through its devolved departments (Prefectures and Sub-Prefectures). In 2006 only, it decided to transfer powers to the local authorities, launching a decentralization process that led to the adoption of the local government code (*Code des Collectivités Locales*). The land tenure system is split between the devolved and decentralized authorities.

The implementation of this legal framework comes up against a series of issues. The transfer of powers was supposed to facilitate the adoption of the legal framework at the local level, and yet between the devolved and decentralized authorities, the distribution of mandates is often a source of confusion. Besides, the authorities in charge of implementing the land tenure code find it hard to integrate land tenure tools (territorial planning strategic framework, zoning, etc.). The surveys revealed that the Sub-Prefectures and Rural Communes representatives for Sangarédi and Tanéné have limited knowledge of the code and that given the lack of resources, they are unable to implement it. Finally, the public authorities are barely involved in local land management, which does not encourage populations to turn to them so as to initiate land registration procedures.

In the MA, the modern land tenure legislation is barely implemented. Only 12.6% of surveyed households took steps in this respect, mainly applying for land titles. Among them, four households out of five are located in the RA. They are mainly migrants whose settlement was in the framework of transactions with native populations. By contrast, official procedures are of little interest for populations in the IA who resort to local management schemes and acknowledgement by the customary authorities is enough to warrant their legitimacy over land and durability of their rights from generation to generation.

1 Law L/99/013/AN dated 30 March 1992.

2 During his term in office (1954-1984) President Sékou Touré established a State monopoly on land: The State was the sole land owner. Such regime assigned land management to politicians.

3 The purpose of the declaration on land policy in rural areas (Decree D/2001/037/RPG) is to secure land rights and favour the development of a transparent and faire land market.

12.5.2 ***Identification of resource areas in the MA***

12.5.2.1 *Land use*

In order to understand land tenure systems in the MA, the first step consists in describing land use patterns. It is not a reassessment of the agricultural background as it was addressed in a specific section (see *Section 12.3.1*), but an overview of land use patterns, since they contribute to the distribution and organization of the local populations in the MA.

In the MA, two agricultural development systems structure local land use:

- Agroforestry: a system where spontaneous tree varieties grow alongside cultivated ones (cola and fruit trees mainly). Spontaneous trees form a land cover that maintains the moisture content needed for the cultivated varieties to grow. In the study area, this technique is typically applied in bottom lands and most often results in the development of gallery forests.

- Slash-and-burn: the most common agricultural development system. This system commonly referred to as "shifting" cultivation relies on the intermittent cultivation of same plots of land. A plot of land is cultivated on average for two years before being left fallow for 5 to 7 years. Respecting this fallow time is required to ensure soil regeneration. Only then can this same plot of land be cultivated again. The slash-and-burn cultivation of each plot of land is therefore included in a cropping cycle relying on the alternate cultivation of additional plots. In order to conduct such process and ensure the sustainability of the cultivation pattern, a farmer needs to have access to 5 to 7 times the surface area he cultivates in a year.

12.5.2.2 *Typology of the resource areas identified in the MA*

The typology of the resource areas identified in the MA (Djolol, N'dantari, Hounsire, Donghol and Bowal) has been described in the *Section 12.3.1.*

Depending on the resources and uses under review (agricultural, pasture, wood resources, etc.), management schemes may vary. As a consequence, a same plot of land may be characterized by different management schemes.

12.5.3 ***Identification of land tenure systems***

12.5.3.1 *Prerequisite*

Access to resource areas varies depending on the status of users and associated land uses and is regulated by a land tenure system. Through the surveys, the different types of land tenure systems existing in the area could be determined. Such typology indicates how land rights are assigned depending on resource

areas. The models identified on the eastern and western banks are different: there are a Landoma model and a Fula model[1].

Both systems rely on a principle of collective management of resources. These customary systems acknowledge shared ownership and not exclusive and individual ownership. Shared ownership is divided into two main types of rights: control and use rights, which are in turn divided into a series of rights or a "bundle of rights[2]".

- control rights allow their holder to supervise the organization and grant use rights; and
- use rights include rights to use the land, sell products for profits or use its resources.

Based on field data, it seemed essential to distinguish active control rights from induced control rights.

- Active control rights mainly fall within the scope of short-term resource management (annual redistribution of plots of land among entitled parties, organization of land uses).

- Induced control rights are more a kind of scrutiny over all the activities when they may trigger a long-term change in the access to resources (development, lease and potential sale[3]). People holding these induced control rights are liable toward a group for which they act as the land administration: they must warrant their access to the resource, and as a result the durability of the resource itself. Exercising induced control rights there by acknowledges the pre-eminence of a group over land (often related to land use history that may also be justified by social statuses[4]).

The list of rights retained varies from one typology to the next, depending on the authors and scope of work. In order to develop an entitlement matrix integrating this notion of shared ownership, the land tenure survey relies on the theory of bundles of rights which acknowledges the distinction between use rights and control rights. The land tenure survey also specifies the way in which active and

[1] Although these systems are significantly different, they mutually influence each other. Hybrid models (Fula /Landoma) are widespread on the west bank where of the Tinguilinta where the population is heterogeneous. The Fula model is more favorable to the individualisation of rights, therefore, hybrid models mainly appear in the Landoma areas which face the introduction of new uses (cash crops).

[2] Colin, 2005; Chauveau, Colin, Jacob, Lavigne, Le Meur, 2006.

[3] In customary systems, land is inalienable as a matter of principle. As a result, exercising the alienation right is more a matter of scrutiny, i.e. those holding active control rights have a duty of disclosure toward higher authorities. Although their authorization is mandatory, in most cases, the sale price is entitled to those holding active control rights.

[4] These two situations are encountered on both sides of the river Tinguilinta. See the section on unequal access to resources.

induced control rights are shared[1]. According to different methods, these rights are distributed between individual and collective levels (lineage group embodied by the head of lineage or village group embodied by the customary authority of the village–often the elder of the founding lineage).

The following tables outline information on how these rights are distributed depending on the areas under consideration and usages. Through the presentation and typology thus chosen, the level of exercise where land tenure right applies most notably (active control rights) can be identified, while involving further levels, either to compensate for an involvement through work (use rights) or to comply with customary procedures requiring the involvement of a higher authority in the management of land-related issues (induced control rights).

12.5.3.2 *Typology of land rights in the MA*

The typology of land rights in Landoma and Fula areas are summarized in *Table 12.13* and *Table 12.14.*

Table 12.13 Typology of Landoma land rights

		Levels of exercise		
Resource area	**Use**	**Village**	**Lineage**	**Individual**
Hillside *tabòn*	Annual crops	Induced control rights	Active control rights	Use rights
Bottom land *dassamba*	Annual crops Market crops	Induced control rights	Active control rights	Use rights
	Perennial crops	NA	Induced control rights	Active control rights Use rights
Grove on a flat surface surface plane *koumbatsé*	Annual crops	Induced control rights	Active control rights	Use rights
Grove on sloping surface *toròn*	Pasture	Induced control rights Active control rights	NA	Use rights
Bauxite plateau *koubouli*	Use of natural resources	Induced control rights Active control rights	NA	Use rights

NA: Not Applicable
Source: INSUCO

[1] This typology relies on the works of E. Schlager and E. Ostrom, 1992, on the management of shared goods. A glossary explaining such typology is provided in Annex 12.3.

Table 12.14 Typology of land rights in Fula areas

		Levels of exercise		
Resource area	**Use**	**Village**	**Lineage**	**Individual**
Hillside *djolol*	Annual crops	NA	Induced control rights	Active control rights Use rights
Bottom land *dantari*	Annual crops Market crops	NA	Induced control rights	Active control rights Use rights
	Perennial crops	NA	Induced control rights	Active control rights Use rights
Grove on a flat surface *hunsiré*	Annual crops	NA	Induced control rights	Active control rights Use rights
	Pasture	NA	Induced control rights Active control rights	Use rights
Grove on a sloping surface *donghol*	Pasture	NA	Induced control rights Active control rights	Use rights
Bauxite plateau* *bowal*	Use of natural resources	NA	Induced control rights Active control rights	Use rights
	Pasture	NA	Induced control rights Active control rights	Use rights

* In Fula areas, lineages claim rights on the portions of bauxite plateaus adjoining their plots, and on the pockets of vegetation located there.
NA: Not Applicable
Source: INSUCO

12.5.3.3 *Individualization of land rights*

The status of land owner assumes that an individual can hold the three types of rights (use, active control and induced control). Such status does not exist in the customary systems observed in inland areas. By contrast, it is increasingly widespread along the road, where financial transactions enable individuals to break away from the higher authority.

Procedures are only partially formalized; a simple document signed in front of witnesses confirms the transaction was duly completed. This document has no legal value. What is sought is not necessarily the legal validity of the procedure but rather the local acknowledged transfer of full and permanent land rights[1].

[1] Through local acknowledgement, immigrants may secure their rights for several generations, they protect themselves against potential claims made by descendants of customary owners who would be tempted to assert their ancestral legitimacy to claim land rights.

In the MA, farming land is essentially bought to plant cashew trees. The development of cashew cultivation has been ongoing for some thirty years along the road and started in the IA less than a decade ago, predominantly on the West side of the river Tinguilinta. Such cash crops were initiated by non-native people. Through customary settlement procedures, these people would be assigned a housing plot and an adjoining plot of cropland (for the cultivation of perennial and annual crops). Most of them used these plots to cultivate cashew. The profitability of these plantations has encouraged local people to adopt them too. Households first started cultivating near their houses, then on areas that were originally not suitable for annual crops (on sloping surfaces). Spurred on by customary authorities, areas that were until then dedicated to annual crops, were converted into plantations: the authority holding the control rights (village or lineage) spilt land between lower levels (lineage or individual) thereby extending their land rights from simple use to active control, which allows them to plant.

As a matter of principle, customary law makes a distinction between the rights over trees and the rights over the plot of land where they are growing, however with cashew tree plantations, customary rights have been redefined: rights over trees have increasingly become rights over land (or simply put, the right to plant a tree allows or may allow the individual to claim a right over the plot of land). The individuals that are part of a group (village or lineage) are taking advantage of cashew cultivation to break away from the group and expand their rights over plots of land. However, they cannot be considered as exclusive owners in the same way as those who bought such rights. They still have to involve the group in decisions related to sales.

Table 12.15 Individualization of land rights over cashew tree plantations

		Levels of exercise		
Resource area	**Use**	**Village**	**Lineage**	**Individual**
Cashew cultivation on all types of resource areas	Parceling out of collective land	NA	Induced control rights	Use rights Active control rights
	Purchase	NA	NA	Use rights Active control rights Induced control rights

NA: Not applicable
Source: INSUCO

For some ten years now, plots of farming land in roadside villages mainly include cashew tree plantations. As a result of these new activities, small towns of planters are trying to assert their autonomy with regards to the territories where their plantations are located. Along the road, cashew tree plantations thus lead to the fragmentation of land governance together with a weakening of the customary authorities.

12.5.4 *Identification of territory distribution patterns*

12.5.4.1 *Centralized land governance on the west bank and fragmented land governance on the east bank*

There is a significant difference between the land tenure system observed on the west bank of the river Tinguilinta (area mainly populated with Landoma people) and the one observed on the east bank (area mainly populated with Fula people).

In the West bank, control rights are centralized at the level of the village group (which gathers all the lineages) which results in the management of land by a customary leader on behalf of a village community. In the Fula model however, control rights are held at the level of the lineage group[1]: each lineage elder is therefore in charge of managing the land of a group with a common descent, independently from the village group. When reviewing transfer patterns, such difference in land governance levels may also be fathomed in Landoma and Fula areas[2].

The way land rights are distributed has consequences on the way village groups conceive their spatial scope.

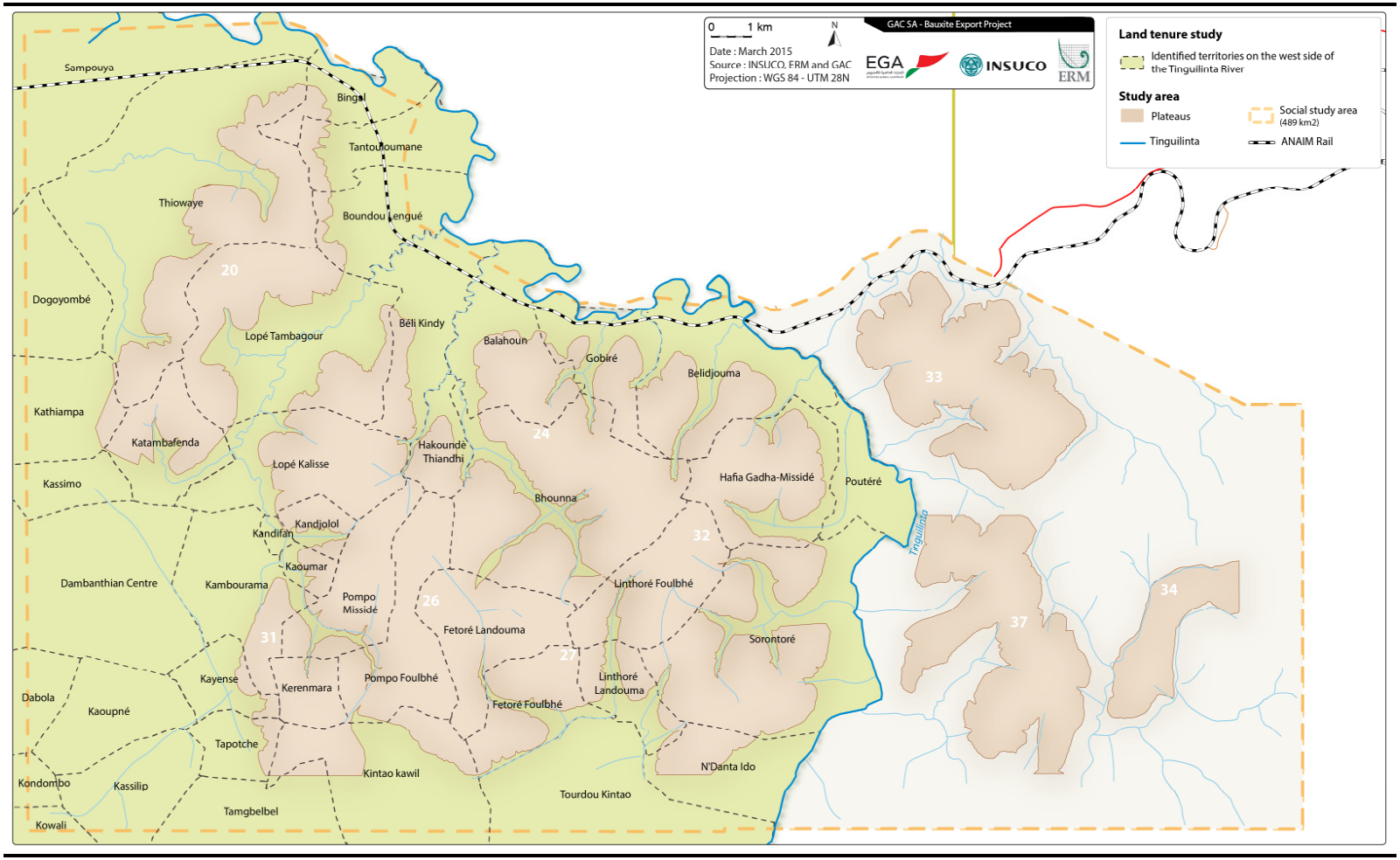
On the west bank of the river Tinguilinta, the centralized management at the village level led to the definition of boundaries within which cleared plots fall under their control. Such boundaries are marked by natural features (watercourses, hill crests, crossroads, tall trees) or man-made ones (stone heap).They are defined when a new village is founded or through consensus between neighboring villages. Such boundaries could be identified during the surveys and were used to delineate territories[3].

[1] A lineage is a group of relatives gathering all the individuals with a same male ancestor.

[2] In the Landoma model identified, the land developed by an ancestor is considered as indivisible. Although its descendants have privileged access rights to the plots making up such estate, the rights associated with their control are exercised by the group elder, then village elder in the last resort. In the Fula area, transfer leads to the fragmentation of lineage rights and land: each descendant has consolidated rights (use rights + active control rights) over a share of the lineage land. This transfer pattern leads to the fragmentation of land governance among several related locations: relatives from neighboring towns or villages may each have consolidated rights over portions of a common estate.
Land transfer patterns are detailed in *Annex 12.3 – Further Information on Social Report Data.*

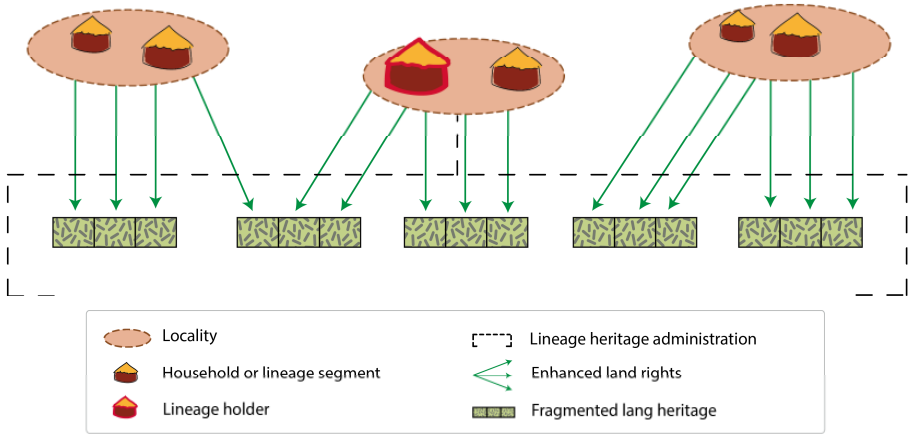
[3]When boundaries are defined by clear lines (watercourses or roads), their identification was reported on the map. By contrast, when boundaries where materialized with "milestones", they were connected so as to shape territories.

Figure 12.53 Territories identified on the west bank



In the Fula area, land governance is at the lineage level. The village unit is operating to consider buildings and the social organization, however it is not associated with a delineated village territory. Lineage estates are spread over related hamlets and the village territory does not correspond to a land management unit. Mapping village territories on the east bank of the river Tinguilinta was therefore impossible.

Figure 12.54 Distribution of land rights and spreading of lineage estates on the east bank



Source: INSUCO

12.5.4.2 *Unequal access to land*

All the villages and lineages in the MA do not have the same conditions of access to land. Land tenure status partially depends on the conditions under which they settled. Several indicators shall be retained, the main ones being settlement history, founders' status, relationship between founders and obviously the presence of available plots of land at the time of their settlement[1].

The distribution of territories on the west bank was used to identify "decision-making" centers, i.e. customary authorities involved in the land governance of a given territory and supervision of the access to croplands for other "dependent" villages. Several dependent villages may therefore be associated with the same territory.

The multiplication of villages in a same territory may result from various processes:

[1] For further details, data on population and its land-related implications are shown in *Annex 12.3 – Further Information on Social Report Data.*

- split of the founding village: a branch of relatives founds a hamlet on its croplands, its members still have land rights over the village territory while being involved in its management.

- settlement of "non-native populations[1]": customary settlement procedures make provisions so as to provide them with housing plots and adjoining croplands, however access to croplands depends on the lending arrangements with the higher authority[2].

Relatives in the segmented group have rights[3]over the village territory, whereas non-native populations only have "precarious use rights[4]" over annual croplands (they only have access to land through lending for which an application shall be submitted every crop year). Depending on their settlement history, some non-natives are able to increasingly secure their land rights, i.e. obtain a small share of active control rights. Nevertheless, even on these plots of land, higher authorities still have induced control rights. Together with such unequal access to resources, non-natives are kept out from the management of the territory which is exclusively intended for lineages since they are considered as natives. Only through an extended settlement history, can a non-native be involved in the land management of the territory[5].

[1] The notion of "non-native" is subjective. In the MA, it is essentially used to qualify migrants who settled after the road was built, during the 1970s. Conversely to those who settled before this period, these "non-natives" could not build estates and thus depend on the higher authority to have access to croplands. Since they could not build an estate, they are kept out of land-related issues, thereby maintaining them in their status as "non-natives".

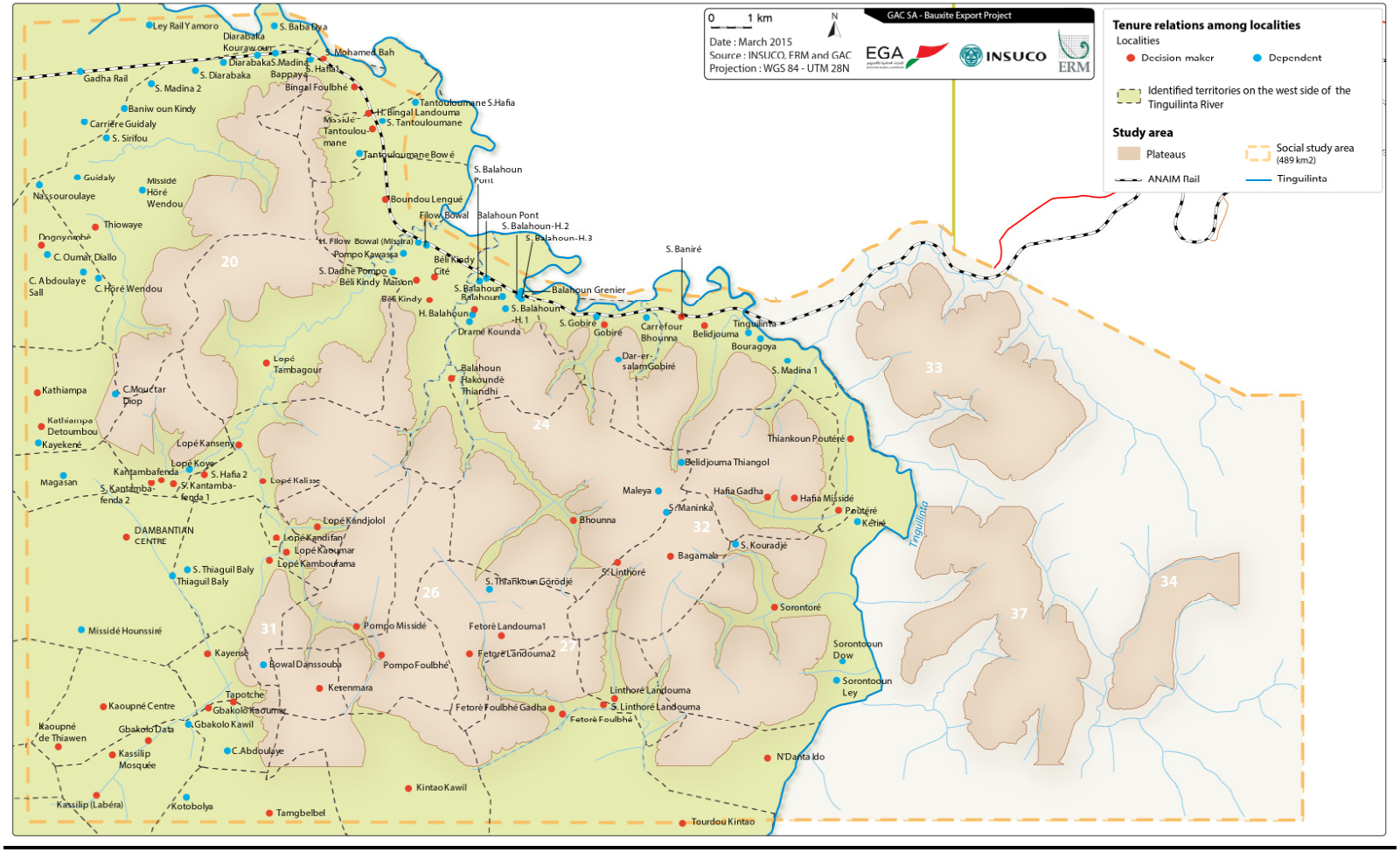
[2] The higher authority is responsible for the immigrant toward its community and the immigrant himself since it must be able to give him croplands to fulfil his needs.

[3] "Right of each lineage member to have access, every year, to an area dedicated to annual or biannual crops on hillsides, and cultivate it. Conversely to the other individual rights, this is not to be negotiated: it is imprescriptible." (REY P., 302: 2011). It warrants for all the ability to conduct an agricultural activity in the broad sense of the term.

[4] The terms regarding land statuses are described in *Annex 12.3.*

[5] In the Landoma area, the individual who embodies the customary authority does not often come from the founding lineage. The settlement history of a lineage assumes that its members know the history of the area and more specifically that of the associated land. Through such knowledge, lineages that are not founding lineages may embody the customary authority.

Figure 12.55 Autonomy of the villages within the territories of the west bank



Similar inequalities were observed on the east bank of the river Tinguilinta, but they are due to other factors, i.e. former power relations between populations descending from "masters" and others from "captives" (see. *Section 12.1*).Such relations which were officially banned in the middle of the 20th century are still influencing the current distribution of land resources.

"Captives" who settled at the periphery of their "master's" village could not aspire to manage the land they cultivated. This privilege was held and exercised by masters. Despite policy changes (abolition of slavery mainly), the descendants of these enslaved populations would have inherited the precarious land tenure status of their ancestors: as a matter of principle, these rights are control rights on the land they cultivate, but they often go together with active control rights[1].

Finally, whether in the Fula or Landoma areas, unequal access to land resources is not a set situation. Individuals may extend their land rights through alliances or using the support from the local authorities[2]. They may also find arrangements and negotiate the transfer of rights with their higher authority, or even buy rights to secure full control[3]. The renegotiation of rights is mainly due to the development of cashew cultivation.

[1] According to "masters'"descendants, "former captives'"descendants should apply every year for the right to cultivate. Obviously, such a discourse is not relayed by "captives'" descendants, who try to deny that such inequalities could ever exist.

[2] It is a significant issue on the east bank, where the village of Soucka organised as a district reportedly took advantage of its status to assert its land authority toward the Wossou lineages. Several captives' descendants also reportedly applied to be incorporated into this new district so as to take advantage of this emancipation movement. On the whole, the villages associated with the Soucka district have obtained autonomy on the land that used to be cultivated by their ancestors. The land tenure status of some estates is however still subject for debate. Besides, some lineages did not wish to rally this emancipation movement for fear they might lose the advantages they have through the good relationships they have with Wossou (mainly associated with the lending of additional plots of land).

[3] A table summarizing how land rights are distributed among the members of dependent villages and their higher authority is shown in *Annex 12.3 – Further Information on Social Report Data*.

Box 12.5 Summary of land tenure in the MA

The public authorities in the mine area are little involved in local land management given the lack of knowledge regarding the current legislation or resources to implement it.

Besides, migrant and native populations do not resort to the same land tenure schemes as the public authorities to assert their legitimacy over a plot of land.

The scale of land governance indicates the authority which can legitimately address land-related issues. It varies from side to side of the river Tinguilinta:
- on the west bank, through the mapping of territories, the spatial footprint of the land areas claimed by village groups may be visualized and decision-making centers identified; and
- given the absence of territories in the Fula area, a preliminary exercise should be carried out to identify lineage as part of the RAP.

The conditions under which land rights are assigned point to the need to retain various uses and consider the rights of several individuals over a same area:
- the review by bundle of rights distinguishes various land statuses for the RAP (relying on the conditions under which land rights are assigned); and
- the conditions under which land rights are assigned highlight the level at which land rights are exercised in the most significant way (individual, lineage group, village group).

Land tenure systems in the area are currently being redefined (claims, renegotiations) by communities, who adapt their system to social and economic transformations. Those changes might lead to conflicts that could be encountered in the development of a RAP:
- the development of cash crops secures land rights for a category of people and denies them to others (beneficiaries of a lending agreement, cattle breeders) who may therefore become vulnerable; and
- the development of cash crops confronts a land tenure system based on the collective management of land to individual claims over plots.

However, the land-related implications associated with population development may offer some understanding that could be used as part of the conflict management process.

12.6 LOCAL GOVERNANCE

12.6.1 Public authorities

12.6.1.1 *The administrative authorities in the area and their prerogatives*

In Guinea, power is locally split between several political-administrative entities. On the one hand, there are devolved State administrations at the level of the Prefectures and Sub-Prefectures. On the other hand, the decentralization process led to the creation of local authorities called Communes (Rural or Urban) and Districts. The administrative history in Guinea and differences between political-administrative entities (regarding their role, functioning and prerogatives) are detailed in *Annex 12.3–Further details on social report data*.

The MA is fully included in the Boké Prefecture but is divided between the Sangarédi and Tanéné Sub-Prefectures (SP). These SPs locally represent the State and the Government. As a result, they warrant the due implementation of national policies at the local level. Their main prerogatives are to:

- ensure that local sector policies comply with the current legislation; and
- promote local development by supporting the local authorities when implementing their sector policies.

In this respect, the Tanéné and Sangarédi SPs have an executive branch (Sub-Prefect, Deputy Sub-Prefect, Secretary General(s), collector and advisors) and several technical departments, as shown in *Table 12.16.*The SPs are also in charge of police forces (*Police & Gendarmerie*).

Table 12.16 Technical departments in the Tanéné and Sangarédi Prefectures

	Tanéné	Sangarédi
Technical departments	Education Health Youth Water, Forestry and the Environment Agriculture and rural development Breeding	Education Health Youth Water, Forestry and the Environment Agriculture and rural development Breeding Housing and Urbanism Quality control Labor inspection

Source: INSUCO

However, given the lack of resources, the technical departments cannot properly implement legislations and initiate activities. Besides, technicians are not adequately trained to carry out all their technical and administrative duties.

The MA is also divided into the Tanéné and Sangarédi Rural Communes (RC). Both have the same geographical boundaries as the Tanéné and Sangarédi SPs.

The RCs are the root local authorities as defined by the local government code (*Code des Collectivités Locales*).Their main missions are to:

- manage the current affairs under their responsibility;
- supervise the Districts, which are at the root of the administrative system;
- locally define sector policies in the 32 areas of expertise under their responsibility; and
- prepare a local 5-year development program, mainly through a Local Development Plan (LDP)[1].

The LDP is the only planning document the Tanéné and Sangarédi RCs have at their disposal. The LDP for Tanéné has expired without achieving half of its objectives. Its renewal, if any, is not on the agenda. The LDP for Sangarédi is to be renewed by 2015. Besides, although it is not a genuine strategic orientation tool, the LDPs for Tanéné and Sangarédi are rather lists of priority development actions for public infrastructures (schools, healthcare centers, hydraulic pumps, road maintenance, etc.) and resource management (forest protection, transhumance areas, etc.). Budget projections, if any, do not specify the sources of funding (internal/external). This lack of information reveals the wide gap existing in most cases between planned development objectives and resources available at the RC level.

Finally, the MA is divided into eight Districts which are the local representation of the administration. Districts are created by the Prefect. As a result, although Ordinance 079/PRG does not state so, rural areas may form Districts upon simple request to the Prefecture. That is how Wossou became a district and broke away from the administrative authority of Soucka.

Although Article 3 of the local government code considers Districts as simple "sections of Communes", their involvement in the implementation of local policies cannot be denied. As a matter of fact, Districts have the following missions:

- work for the administrative and political management at the root of the system; and
- contribute to the economic and social development of the area, preparing a District Development Plan (DDP) and participating to the prioritization of the activities to be conducted as part of the Annual Investment Plans of the RCs.

In practice, no District has the capabilities or resources (human, technical and financial) to fulfill its functions. None of the eight districts in the MA has a DDP nor plans to create one in the near future. As a root entity, their role mainly

[1] The LDP is followed by the development of an Annual Investment Plan which prioritises the actions to be conducted and presents associated budget projections.

consists in ensuring that traditions, culture and social cohesion are respected. Moreover, Presidents and district committees are mainly, and as shown in *Table 12.17*, elected by the Commune or appointed by elders. Although committee members are renewed at the end of their term in office, district presidents remain in office until they can no longer assume their assignments in case or age or illness, or in case of a serious offense or disagreement with the Council of Elders.

Table 12.17 Districts in the MA

RC	Districts		*Assignment*	Date of latest renewal	*Cause of latest renewal*	Council of Elders
Sangarédi	*Balandougou*	President	*Appointed by elders*	2011	*Resignation because of age*	Yes
		District committee	*Appointed by elders*	2004	*End of term in office*	
	Boullérè	President	*Appointed by the RC and SP*	2012	*Resignation because of age*	Yes
		District committee	*Elected by the community*	2004	*End of term in office*	
	Soucka	President	*Elected by the community*	2005	*Resignation because of age*	No
		District committee	*Elected by the community*	2005	*End of term in office*	
	Wossou	President	*Appointed by elders*	2014	*Incompetence*	Yes
		District committee	*Appointed by the village council*	2009	*End of term in office*	
Tanéné	*Dambantian*	President	*In theory elected but actually appointed through succession*	NC*	*NC*	Yes
		District committee	*Elected by the community*	NC	*NC*	
	Kintao Daconta	President	*Elected by the community*	NA**	*NA*	No
		District committee	*Elected by the community*	2011	*Divergence of opinion*	
	N'Daghara	President	*Elected by the community*	1984	*Death*	Yes
		District committee	*Elected by the community*	NA	*End of term in office*	
	Tanéné	President	*Appointed by elders*	2013	*Death*	Yes
		District committee	*Appointed by elders*	NA	*End of term in office*	

*NC: Non Communicated;
**NA: Non applicable (never happened)
Source: INSUCO

12.6.1.2 *Complex relationships*

The interviews carried out revealed that the relationships between the various political-administrative entities are complex. They are due to a territorial structure which has been built over time and based on the successive political regimes. They mirror the continuous struggle to assert legitimacy with local populations and the establishment of a power that could have been hard to get.

In the MA, these relationships may be vertical, i.e. between entities at different levels and horizontal between entities at a same level.

Vertical relationships derive from the principle of supervision which states that the local authorities work under the control of the State and its local representatives (Prefecture and Sub-Prefecture).In the MA, the relationships between the SPs and RCs relate to legal control, compliance with national policies as well as to local technical support, advice and guidance. Mayors and Sub-Prefects regularly work together by pooling their resources to fulfill their mandates. However, the Sangarédi RC which has significant financial resources thanks to mining revenues, has more challenging relationships with the Sangarédi SP, compared to the Tanéné RC with the Tanéné SP.

It should be noted that the existing relationships between SPs and RCs raise many issues in terms of local governance. SPs and RCs act alternately in a voluntary or dismissive manner. Conflicts regarding jurisdiction are increasingly frequent. Each denounces the poor practices and lack of transparency of the other party. There are actual risks of interferences[1], whether direct or concealed.

Horizontal relationships are between entities at a same level. They essentially rely on the claim and legitimacy these entities have to rule a same territory. In the MA, they are mainly observed among Districts and are generally linked to the split between public and customary powers. The main examples below may be presented as a reference:

- Thanks to the strategic ties built with other locations such as Boullérè, Soucka became a District to the detriment of Wossou which founded the area (traditionally speaking). Some neighboring locations decided to use the administrative representation of Soucka to break away from the land control exercised by Wossou. Wossou had to wait for the political haze of 2009 to be granted the status of a District. The relationships between these two Districts are often conflicting.

- For some time, there was an institutional ambiguity in the MA regarding the status of Parawol and Kintao Daconta as the District capital. In September

[1] Interference is the denial of the legitimacy and integrity of an entity under the pretext of helping the population.

2014 only, Kintao Daconta officially became the capital of the District of the same name, and therefore the sole seat of the local power.

- Tinguilinta is officially the subsector which is part of the Bhounna sector, in the Dambantian District. Although it is the most populated town, its official status has not been changed by the Prefecture. As a matter of fact however, the president of the Dambantian District lives part of the year in Tinguilinta (as well as in Gobiré, and more occasionally in Dambantian). The current president of the District who comes from a founding family of Gobiré has significant power in the area. Combined with the rapid growth of Tinguilinta, this situation contributes to the ambiguity on the status of Tinguilinta.

12.6.2 *Local and customary powers*

Although there are some exceptions, the local authorities stand as genuine territorial units based on the sociocultural history of the area. As a result, they are by nature very close to the customary power. In Guinea, the public power is hardly dissociated from the traditional/customary power, in the daily management of an area.

12.6.2.1 *Sectors, between administrative and customary power*

The sector is a unit which usually encompasses a village and its hamlets. The sector is used by the administration to implement micro-local development policies, although the sector is not recognized by the Constitution.

Most often than not, the head of sector (de facto always a man)is considered as a village chief. This role is more a matter of representation than decision-making, since he is not systematically a member of the founding lineage (although it is mostly the case in the MA). The legitimacy of the head of sector is therefore firmly embedded in the alliances and relations networks which shape village communities. He is responsible for receiving external parties or representing the village at the higher administrative level. He is also involved in the resolution of conflicts among the population, his role complementing that of the traditional authorities. The head of sector is always associated with a committee which shares the responsibilities.

12.6.2.2 *Traditional and religious powers*

Traditional chieftainship was officially banned in 1957. Traditional figures however still play a major role in the decision-making process on conflict resolution, organization of sacrifices, organization of major events (blessing of alliances, funerals) or settlement of migrants.

- The lineage is a group of relatives which includes all the individuals with a common male ancestor. Usually, one or several ancestors of the lineages founded the villages. Founders are joined by other individuals who were

invited to settle or who sought shelter and whose descendants created new lineages. The order of arrival of these lineages in villages is a key element which set the hierarchical organization of the traditional powers. The "first" or founding lineage has a central role in the decision-making process. When a same lineage founded several villages in the same area, it ruled them all.

- The Council of Elders is a significant institution at the village level since it includes nearly all the elders of each lineage, some scholars (religious, traditional) and mirrors the authority in place. In order to quality as a member, elders must: have moral character, be honest, able to defend interests and resolve conflicts in the village. Among other things, the Council of Elders manages social events (weddings, baptisms) and land-related conflicts. In the MA it often settles conflicts between herdsmen and farmers.

- The Council of the Mosque plays an essential part in the MA since Islam is the main religion. It does not necessarily include the same members as the Council of Elders. It is chaired by the first Imam. The other members are chosen for their high level of knowledge of the Quran. They may be from a neighboring village where there is no mosque. The Council has its own assignments. It is in charge of guiding the population regarding the Muslim faith and perpetuation of the religion in the villages, organizing daily prayers, celebrations and religious events that punctuate social life (weddings, baptisms and funerals). Besides, the Council of Elders may turn to the Council of the Mosque to refer to Islamic laws when settling a matter or conflict.

12.6.3 *Civil society*

12.6.3.1 *Local associations*

There are many local associations in the area, generally at the level of a couple of locations. There are the roots of the social organization in the sense that their main activities are to provide specific services and/or guarantees regarding to the households and village needs (in terms of economic activities as well as social events, resolution of conflicts between people, help for vulnerable households, etc.). As a matter of fact, these associations are also at the root of the organization of the rural economy, thereby contributing to the improvement of living conditions.

The types of associations present in the area, the activities they carry out and their main operating conditions are described below:

- The *Kilé* (see *Section 12.3.1*) is present across the MA, although it is not a structured organization.

- Groups which are associations of individuals who collaborate and mutually help each other as part of income-earning activities such as market

gardening, agriculture, crafts, processing, etc. As opposed to *kilé*, groups are in theory structured, roles and responsibilities are clearly defined and actions follow a set strategy. Collective productions are widely intended to be sold and generate income. The profits made by a group may be directly shared among its members or collectively kept. Profits are usually used to:

- help its members in case of social justifications, through donations in kind or even in cash (circumcisions, baptisms, weddings as well as bad health or funerals);
- grant individual financial loans, either to group members only, to non-members or to both, in the latter case under variable conditions;
- collectively buy equipment to be redistributed among members; and
- invest in a new activity.

There is a vast number of groups in the MA, some of which were set up in order to receive donations and/or support like those of the GAC Project. Groups are irregular. Their "lifespan" may greatly vary, especially depending on the support they receive from outside sources. As a result, groups were not listed in this survey.

- Youth and women's organizations, if any, are generally at the supra-village or sector level. Their main purpose is to organize social, cultural and sporting events. Depending on the implication of each, they may also engage in the development of work groups as part of community activities (upkeep of water bodies, clearing of paths, etc.).

- Clubs or "tontines" are made up of members pooling a sum of money without any prior collective activity. The money thus collected is used in various ways (daily expenses, family events, etc.). Members may use such money as they please, provided they pay back the sum thus borrowed. Clubs or "tontines" are like a local lending system without any interests for its beneficiaries. Since these systems may vary from one location to the next, they were not listed in this study.

12.6.3.2 *NGOs*

No NGO is directly located in the MA. Their action, if any, is intermittent and local authorities are often unaware of it. Several local and national organizations and NGOs based in Sangarédi or Tanéné occasionally work in the Sub-Prefectures.

For example, the following organizations may be mentioned: the *Centre du Commerce International pour le Développement (CECIDE)* given its involvement in the mining sector, corporate social responsibility (CSR) and the defense of populations' interests. CECIDE is an advising and advocacy organization working toward the capacity building of local authorities and populations in the areas of governance and transparency. It acts as a lobbyist and watchdog in

the same areas. Funding is provided through calls for proposals or from partners involved in the same issues, thereby allowing it to remain fully independent from mining companies.

In the Sangarédi area, CECIDE has conducted awareness campaigns and worked with three paralegals on the aforementioned issues, for the defense of populations' interests. It has fairly good knowledge of the mining code and requirements associated with compensation and resettlement schemes.

The *Centre d'Etudes en Coopération Internationale (CECI)* is another NGO active in the area. Based in Montréal (in Québec, Canada) with offices in Conakry, CECI aims toward capacity building for the development of disadvantaged communities. It has been working for several years with the technical departments of the devolved and decentralized authorities in the Boké area, in the framework of Local Development Plans (LDPs) and Annual Investment Plans (AIPs).

Initiatives et Actions pour l'Amélioration de la Santé des populations (*INAASPO*) also has an office in Sangarédi. This NGO has already worked with the GAC Project as part of a survey and awareness campaign around HIV/AIDS in the Project area in 2008-2010 (21 villages to the north, railway and port). The prevalence of HIV/AIDS was approximately 4.5% back then, which is very high compared with the national average. This NGO also collaborates with *Faisons Ensemble* (2011/2013) and *Stop Palu* (USAID-Guinea) to fight malaria.

12.6.3.3 *Development support programs*

As explained above, some development programs have been implemented in the MA. *Table 12.18* summarizes the key development organizations that have been involved as part of the Poverty Reduction Program, ongoing since the early 2000s.

Table 12.18 List of key development organizations in the MA

	Year	Issues	Geographical scope
Japanese cooperation	2002 - 2003	Water supply	Béli Kindy, Fétorè Foulbhé, Guidaly, Kalinko Roundé, Sampirin Mamacira, Soucka, Thiankoye
IFAD (International Fund for Agricultural Development)	2000	Water supply and education	Sampirin Misside, Dambantian
GAC Project	Since 2010	All areas	Areas along the road
PACV (village communities support program)	2003	Water supply	Wossou
PADER (rural development support project)	Since 2009	Agriculture	Kalinko Rounde, Gobiré

Since 2010, GAC has been the key development organization in the MA. It has been involved in several areas: water supply, health, education, capacity building, income-earning activities, community development, agriculture, breeding and sociocultural issues. These interventions however target few areas, all located along the road, like Belidjouma, Tinguilinta or Doubhi.

It should be noted that since it arrived in the area in 2004, GAC has been implementing local development projects. From 2004 to 2010, these projects mostly focused on the northern part of its mine concession area, since the mining project was supposed to be located there.

Box 12.6 Summary of local governance in the MA

The MA is divided into several political-administrative entities: Sangarédi and Tanéné Sub-Prefectures, the Rural Communes of the same name and 8 Districts.

Given the lack of resources (technical and financial) and lack of training of their technicians, these entities cannot conduct all the activities they are in charge of. Their actions largely depend on their relationships with the other entities. And yet they are complex and result from the continuous struggles to assert legitimacy with local populations.

In the area as anywhere else in Guinea, the public authority is only slightly dissociated from the traditional/customary authority in the daily management of the area. Among the most influential at the local level, the traditional/customary authorities include the lineages and notably founding lineages, the Council of Elders and the Council of the Mosque.

There are many small local associations (*kilé*, groups, women's organizations, etc.) in the area, usually at the scale of a couple of villages. They are at the root of the social organization of the communities and rural economy.

No NGO is directly located in the area and those based in Tanéné and Sangarédi are only occasionally involved.

Few development programs have been implemented in the area as part of the Poverty Reduction Program. The GAC Project is currently the most dynamic key development organization in the mine area, although it has only been involved in few areas (mainly those close to the GAC camp, around Tinguilinta).

12.7 CULTURAL HERITAGE

12.7.1 *Summary of definitions and indicators*

12.7.1.1 *Cultural Heritage (CHe) in international standards*

The International Finance Corporation (IFC) distinguishes tangible cultural heritage from intangible cultural heritage. The CHe sites identified in the MA are both tangible and intangible. Their tangible nature refers to a set of knowledge and practices (know-how, oral, musical and technical traditions, etc.), social and political customary relationships and values integrated into a system of beliefs passed down from one generation to the next. Such shared intangible knowledge, practices and values are "embodied" in the tangible manifestations of a culture.

As a consequence, any impact affecting physical items or locations such as the CHe sites identified, also affects their intangible components, potentially having effects that may even undermine the cultural identity of the populations. For instance CHe sites are continuously associated with relationships with genies or ancestors when dealing with cemeteries.

12.7.1.2 *Presentation of the cultural heritage in the MA: sites that are part of a ritual economy*

All the heritage sites in the MA may be split in two categories: natural areas that communities believe to be genies' residences and cemeteries. The relationships cultivated by local populations with the supernatural entities that are genies (or fetishes and amulets including Quran verses) and ancestors are essential in life of communities and individuals.

People turn to these supernatural entities in many human activities, on an exceptional or daily basis. Supernatural entities are involved in ethnicization and territorialization processes, in social and power relations among communities, in disease control, etc. They are called upon because of their abilities that humans do not have. Some individuals still have the necessary knowledge and know-how (all the occult-related occupations) to interact with these entities as part of occasional or regular "contracts".

This exchange is materialized by actions called "sacrifice" (*sélékhè* in Susu language, *sadaka* in Fula language and *sakhaka* in Landoma language). Sacrifices are such a central issue in community and individual lives that there is an actual "sacrificial ritual economy" in Guinea.

12.7.1.3 *Genies' residences*

The MA has an uneven topography characterized by the presence of bauxite plateaus (*bowé*) interspersed with valleys and crossed by many watercourses, either permanent or not. Like forests, caves or rocks, these areas are special places of residence for local genies.

Among genies' residences, four subtypes are represented. They depend on the nature of the more or less close connection that humans have with these places. This connection in turn depends on the "behavior" of the genies which live there (more or less "dangerous" and/or "domesticated"), notably in terms of:

- frequency of visits and access (allowed or not); and
- sacrifices made there (existing or not).

As a result, the typology of genies' residences may be as follows:

- visited, with sacrifices;
- visited, without any sacrifice;
- avoided, with sacrifices; and
- avoided, without any sacrifice.

Such distinction between visit and avoidance, sacrifice and no sacrifice has implications on the level of complexity for addressing these CHe sites. As a matter of fact, when humans "visit" a site and especially when sacrifices are made to honor genies, it is always easier to negotiate with them.
Sites that are avoided and require no sacrifice are generally the place of residence of feared genies. In such case, there is no tie and genies are not considered as a help for humans but as a risk.

Sacrificial rites initiated by humans with genies vary depending on ethnic groups and aspects of the community life in a given location. Their main purposes generally are:

- access to land (to settle and cultivate/plant) and use of the natural resources present at the site location and in the associated territory (water, firewood, fruit, plants, animals, etc.);
- ensured peaceful cohabitation between humans and genies "living" at the site location and on which village prosperity heavily relies (potential for humans to conduct the activities required for their survival, absence of diseases or accidents, sorcerers, etc.); and
- calling genies for help in the framework of a collective project (building of village infrastructures, protection against epidemics, praying for rain, plentiful harvests, etc.) or individual actions (travel, personal undertaking, healing, fertility, employment, etc.).

Finally, visits and sacrificial rites are dynamic realities that change over time. Such changes need to be taken into account since they mirror the ongoing sociocultural changes in the MA.

It should be noted here that relationships with genies are essential to occult specialists and local chiefs whose social status is directly associated with the ritual economy.

12.7.1.4 *Burial sites*

Regarding ancestrality, a core value for the societies in the MA, ancestors accompany the living and look after them. The more ancient are burial sites or associated with the founding of villages, the greater their value since they received the remains of the great men from the community. However, for all these sites, the important things are the remains of those deceased, their souls and perpetuation of their memory.

Burial sites in the MA have different natures. Communities may separate village founders and sometimes men from women, "Elders" and scholars (Muslim or others) from non-scholars and sometimes adults from children.

In Guinea as for all Muslim populations, collective prayers (*fidao*) to God for the blessing of the deceased and the rest of their souls are widespread. They take place at the Mosque or associated prayer areas, and sometimes at the cemetery during Muslim celebrations (Tabaski, Ramadan and the New Year).

Besides, cemeteries are places where people make requests in front of tombs, in a private and individual manner or in a more collective and visible way when turning to elders, scholars or founding fathers, as previously mentioned for genies.

Burial sites are divided into 5 subgroups depending on their visit frequency /use (former/current cemeteries) and on the identity of the people buried there, especially on their social and religious status and position:

- current/former common cemeteries;
- elders' and scholars' cemeteries;
- children's cemeteries;
- founding fathers' tombs; and
- family cemeteries.

For the communities in the MA, elders' and scholars' cemeteries are the most important.

12.7.1.5 *Significance and replication criteria*

12.7.1.6 *Indicators on the "heritage value" of CHe sites*

The purpose of the qualitative surveys performed across the MA was mainly to assign each CHe site a level of significance relative to its "value[1]" for its users. Through these surveys, three significance levels were identified:

[1] Value is a notion directly related to the impact assessment and potential implementation of prevention or mitigation measures.

Low significance
Medium significance
High significance

For genies' residences which classification is the hardest, three main criteria were retained:

- resources to which genies allow the access (*in-situ* and *ex-situ*);
- absence or existence of sacrifices to obtain assistance from genies (collective or individual); and
- site history: the older the site, the more people are attached to it.

Significance levels were given as a reference. They were defined based on the data collected during the surveys which could not go further in-depth given the large number of sites identified. Furthermore, significance may vary over time and be based on other factors (a site may be overvalued by its users who intend to benefit from it). As a result, if further surveys were conducted, it is possible that the significance levels of these sites might have changed with time.

12.7.1.7 *Indicator on the replicability of these sites*

The final purpose of the assessment was to consult communities, on an individual basis, regarding the reasons why they would agree to see their sites lost for good or, to the contrary, why they would wish to protect them or consider their potential reintroduction of their practices on a potential alternative site with equivalent features.

Burial sites are almost systematically considered as the most significant and non-replicable sites. In most cases, their destruction would be hard to consider for their users, or would potentially lead to lengthy negotiations.

12.7.2 ***Sites identified in the CHe study area***

Based on the CHe field surveys, CHe site datasheets were prepared and summarize the nature of these sites, their significance level, replicability and people who manage them. All these CHe datasheets are attached in French in *Annex 12.5 – Cultural Heritage Datasheets*.

12.7.2.1 *Presentation of the CHe sites within the area*

There are no major differences from one area to the next within the MA as far as the nature and significance of cemeteries are concerned. Relations toward ancestors are similar among all social groups.

As far as genies are concerned, the pattern is similar across the MA: in order to settle, the founding fathers had to negotiate with the genies which controlled

the areas and associated resources, since it is always assumed that genies were there before humans. Sacrifices are made to genies in order to "free" a given territory to secure the settlement of houses, crops, plantations or pastures and ensure a peaceful and long-lasting cohabitation between genies and humans. The future of the village, its durability, peace and social wellbeing depend on such cohabitation, thereby accounting for the sacrifices made by founding fathers. There are two methods to free an area:

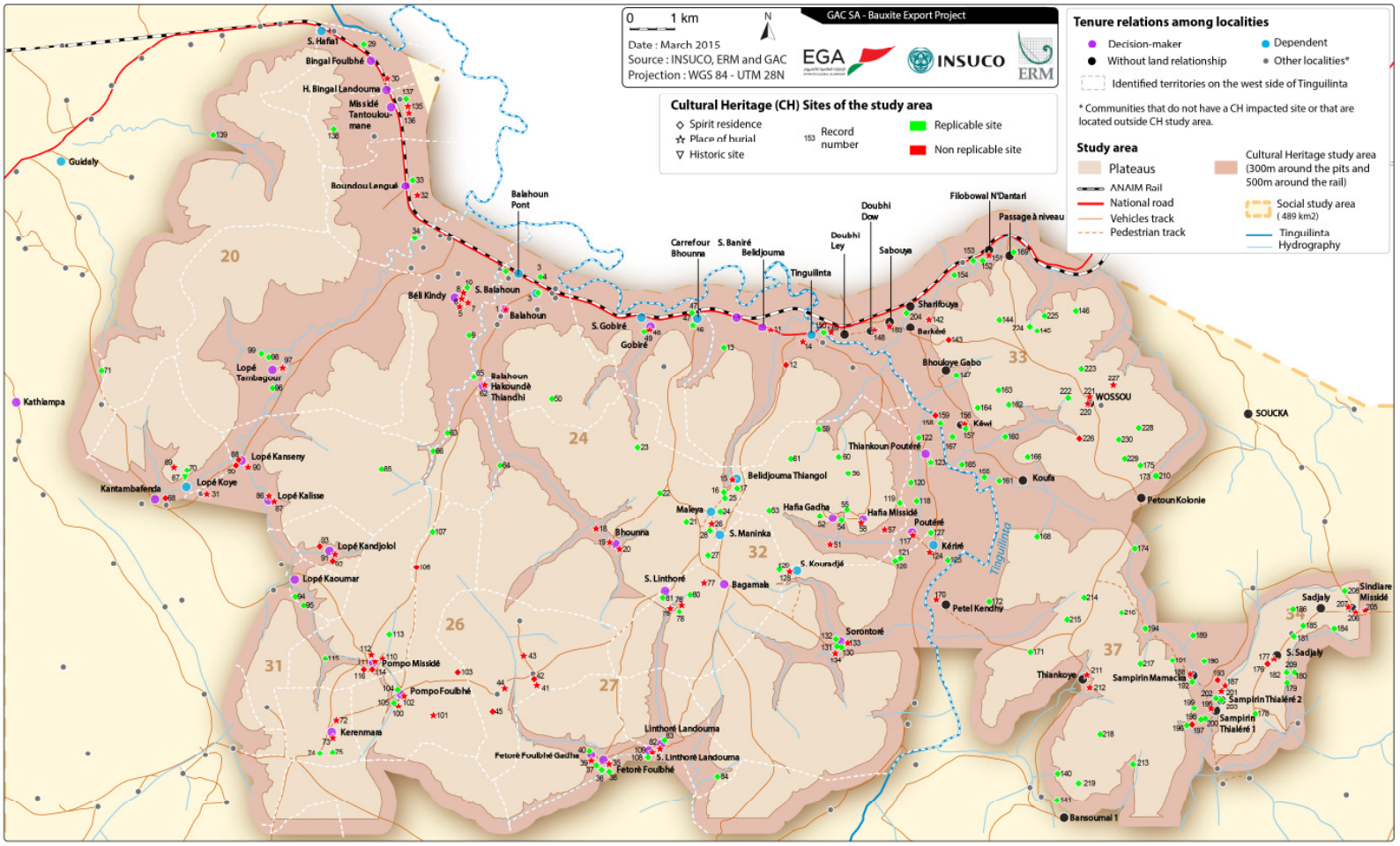
- Landoma populations, known for their fetishist practices, make a pact of association and peaceful cohabitation between humans and genies.

- Most Fula villages occupied by noblemen and former Fula captives of Mandinka origin make sacrifices aiming to separate humans from genies.

This explains why genies' residences are often closer to villages in the Landoma territory whereas they are at a distance from Fula areas.

Figure 12.56 here in after shows the location of all the CHe sites across the CHe survey area which was specifically designed for CHe sites as defined in *Section 11.1.3.*

Figure 12.56 Location of the CHe sites in the CHe study area in the MA



12.7.2.2 *Key figures*

All the locations in the MA were visited as part of the CHe survey but only those located in the footprint of the CHe survey were subjected to further surveys. A total of 230 CHe sites were encountered and listed. Among them:

- 156 sites are genies' residences;
- 73 are burial sites; and
- 1 site is a historic site as a place where specific events happened in the past for local population (it is a natural cave where people sought refuge during past conflicts in the Theocratic State time).

Table 12.19 shows the categories of cultural heritage based on their main features and sensitivity. Out of the 230 sites thus listed, 89 are currently considered as non-replicable by its managers and/or its associated community, i.e. they cannot be removed.

Table 12.19 Classification of the CHe sites identified in the CHe survey in the MA

Sensitivity		Genies' residences				Historic sites	Burial sites				Total
		Visited with sacrifices	Visited without sacrifices	Avoided with sacrifices	Avoided without sacrifices	/	Elders and scholars' cemeteries	Current/former common cemeteries	Founding fathers' tombs / Family cemetery	Children's cemetery	
High	**R**	12	1	1	0	1	0	1	0	0	**16**
	NR	12	0	0	1	0	8	56	4	2	**83**
Medium	**R**	23	2	6	4	0	0	1	0	0	**36**
	NR	2	0	0	0	0	0	0	0	1	**3**
Low	**R**	12	4	14	59	0	0	0	0	0	**89**
	NR	0	0	0	3	0	0	0	0	0	**3**
Total		**61**	**7**	**21**	**67**	**1**	**8**	**58**	**4**	**3**	**230**

Note: A color is associated with each site identified in the MA.
R: considered replicable, NR: considered non-replicable by site managers.
Source: INSUCO

12.7.2.3 *Specific case of Wossou*

The CHe surveys identified two sites which significance and specificity entail a specific management regime: the Muslim scholars' cemetery and the Wossou Mosque both located in the middle of the village.

The survey highlights the importance of Wossou from a historic, political and religious standpoint for the eastern part of the MA and beyond. This is due to the position held by Wossou as a founding village over the whole territory in accordance with what the *Missidé* traditionally represents in the Fula society, a place where all the powers are gathered and its development marks the creation of a new territory. This authority over an ever-changing territory creates tensions. However, Wossou will definitely remain a strong native village.

For the community of Wossou and related villages, the village, mosque and cemetery are a heritage in the strongest sense of the term. They are aware of the historic significance of their village and see their mosque as a center from which Islam is spread over a vast territory. They see the mosque and buried scholars as the symbol of the historic and current influence of Wossou, of the history of their Bah lineage ancestors and of their past achievements.

Box 12.7 Summary of the Cultural Heritage in the MA

All the localities in the MA were visited as part of the CHe study. But only the localities included in a specific area were subjected to detailed surveys about the identification of CHe sites. This specific area includes the following features:

- all the bauxite plateaus and areas in-between;
- a 300 m buffer zone on both sides of this unit; and
- a 500 m area to the north of the railway and extending out from the buffer zone.

A total of 230 CHe sites were encountered and listed. Among them:

- 156 sites are genies' residences;
- 73 are burial sites; and
- 1 site is a historic site (natural cave used during past conflicts).

Out of the 230 sites thus listed, 89 are currently considered as non-replicable by its managers and/or its associated community, i.e. they cannot be removed.

The village of Wossou has a unique heritage character in the MA based on its history, social influence on other villages and two of its CHe sites, namely the mosque and scholars' cemetery.

12.8 SUMMARY TABLE FOR THE MINE AREA

12.8.1 *Preamble*

Some twenty indicators were selected to define the socioeconomic baseline of the MA at a relevant assessment time (t0) and scale. This approach favors the assessment and understanding of the trends measured and their evolution. Besides, the update of indicators as part of a monitoring process will be easier. The list of indicators thus retained is not exhaustive and may be completed at a later stage.

12.8.2 *Selection and calculation of the indicators*

12.8.2.1 *Number of inhabitants*

Determining the number of inhabitants is a good indicator to assess population growth and hence attractiveness of the area, as well asunderstand populations' strategies in terms of settlement (what area is favored). This indicator may be analyzed in relation to the migrant population so as to make a comparison between natural population growth and net migration.
In order to obtain the number of inhabitants, the simplest and most accurate method remains the comprehensive population census.
The census method consists of visiting every household in the project area and counts all the members of the household with a simple questionnaire.
When successive census have been made on several years, it is possible to calculate an average of the annual population growth. This average may then be used to estimate annually the number of inhabitants between two censuses.

If Government have made census in Guinea (1996 and then 2014), the results have to be used carefully. Indeed, the national census did not clearly define the methods used for data collection, selection of localities or even features or a household.

12.8.2.2 *Average size of a household*

The purpose is to determine the average number of individuals in a household. In mining areas, the size of households may quickly vary over time. Heads of households usually arrive alone, hence the presence of a large number of singleton or small-size households. Once the financial situation of the head of household has stabilized, the other members will join him.

The average size of a household is calculated dividing the total number of individuals in the area by the total number of households in this area.

12.8.2.3 *Population under 15 years old*

This indicator is used to assess the level of demographic transition in the area. In theory, the more an area provides economic opportunities, the more it attracts an adult working population. The number of children under 15 should therefore reduce.

This indicator also monitors the local demographic transition. As populations become more dense it can encourage changing household behaviors such as having fewer children.

The comprehensive population census is again a reliable method to determine the share of the population under 15 years old.

12.8.2.4 *Immigrant population*

In an area with great economic potential, population growth is particularly due to migration trends. Knowing the immigrant population has a double purpose:

- comparison of the significance of the migration pattern based on project activities and thus anticipate its future evolution depending on the mining project; and
- development of a migration management program and plan urban development.

The immigrant population refers to individuals who have not always lived in the area. The share of the immigrant population may be determined through census campaigns.

12.8.2.5 *Population density*

Population density mirrors the attractiveness of an area and relative significance of migrations as well as the evolution of the urbanization process. This indicator is also used to understand the main socio-spatial disparities between two areas.

In order to calculate population density, the number of inhabitants in an area is divided by the surface area of this area. A mapping exercise and a population census are carried out in this respect.

12.8.2.6 *Share of property owners*

As part of the urbanization process, with many migrants, access to property ownership is increasingly hard compared to in villages. As a result, it is interesting to determine the share of households who own their houses. This rate may rapidly evolve depending on migration trends. It is calculated based on household declarations.

12.8.2.7 *Share of the population holding a land title*

The share of the population holding a land title highlights household strategies in terms of securing property. This indicator is all the more significant in rapidly urbanizing areas, where access to property ownership is changing. This figure is also calculated based on household declarations

12.8.2.8 *Number of individuals per room*

In a context of significant numbers of migrants coming to town, it is interesting to develop indications on the expansion of a town in terms of housing. The number of individuals per room may give information on the level of comfort of the population. In order to calculate it, the total number of individuals per household may be divided by the number of living rooms available. Then the average of averages is calculated. Living rooms include all the rooms where the household may stay. As a result, kitchens, bathrooms and storage spaces are not included.

12.8.2.9 *Housing quality composite index*

This index gives information on the quality of the walls, roofs and floors of houses. It significantly depends on household money income and may change from one year to the next. This index is based on the principle of valuation. The walls, roof and floor of each house are valued based on the materials that were used:

- Walls built using traditional materials (wood, adobe, earth blocks) = 0; semi-hard standing walls (earth bricks with cement joints / baked bricks / stabilized bricks) = 1; and hard-standing walls (cement blocks / breeze blocks / cement coating) = 2.

- Thatched roofs = 1; tin roof = 2.

- Beaten earth floor = 0; cement floor = 1; tiled floor = 2.

This index is obtained by adding up the scores obtained for the walls, roofs and floors of each house, then dividing, for each household, the score obtained by the number of houses and finally calculating the average value for all the households.

12.8.2.10 *Durable goods composite index*

This index is based on a valuation principle which takes into account the prices of locally-sourced goods, gaps between supply and demand, living standards of the households living in the area, etc.

- radio = 0.3;
- phone = 1.5;

- television set = 3.5;
- bicycle = 4;
- foam mattress = 5;
- motorcycle = 10;
- power generator = 12; and
- car = 50.

In order to obtain this index, the average number of goods per household is multiplied by their valuation and all the numbers are then added up. The result thus obtained is then divided by the sum of all the averages of goods owned.

12.8.2.11 *Enrolment rate in primary school*

The enrolment rate in primary school is the proportion of children aged between 7 and 15 years old who attend primary school compared with the total number of children in the same age group. It is calculated based on household declarations.

12.8.2.12 *Rate of literacy in French*

Literacy rate is a good indicator to assess access to education for all the individuals in the area as well as effectiveness of the education system in place (teaching/learning conditions, drop-out rate, etc.).
Literacy rate here focuses on people aged over 15 who can read and write in French. It is also calculated based on household declarations.

12.8.2.13 *Access to modern medicine*

This indicator gives information on the accessibility to public healthcare facilities for households. Among all the individuals that were sick during the reference year, it is necessary to know the share of those that sought medical attention before calculating the percentage of people who went to a healthcare station, healthcare center or hospital. Pharmacists, who rarely have the required training as well as private doctors and nurses whose skills cannot be easily ascertained, are intentionally excluded.

12.8.2.14 *Satisfaction with the health of heads of households*

This index is used to determine the perception of the head of household regarding his health. More than a medical evaluation, this index gives information on the wellbeing of the head of household. The average of household answers is compared with a 5-level satisfaction scale. It ranges from 1 to 5, with 1 being a very negative perception of his health and 5 being a very positive opinion.

12.8.2.15 *Access to a modern water supply point*

This indicator gives information on access to basic needs, i.e. drinking water[1] all year round. It is expressed as the percentage of households who abstract drinking water from a hand pump or improved well.

12.8.2.16 *Satisfaction with the access to quality water*

Although the rate of access to quality and durable drinking water supply gives valuable information on access to water, it does not mirror all the other difficulties that may be associated with water supply (difficulty to abstract water, waiting time at the pump, water quality, etc.). This indicator is the average of household answers compared with a 5-level satisfaction scale. It ranges from 1 to 5, with 1 being equivalent to deep dissatisfaction and 5 to high satisfaction.

12.8.2.17 *Use of latrines*

This figure gives information on the sanitary conditions in each area. It shows the percentage of people who use latrines (traditional and/or enhanced). It is calculated based on the household surveys.

12.8.2.18 *Population in the primary sector*

This indicator measures the share of the population whose main activity is in the primary sector, i.e. agriculture, animal breeding, fishing and use of natural resources. The decreasing share of the population in the primary sector coinciding with development of a mining project may highlight two trends:

- changes in household strategies in terms of employment, particularly in an area where economic opportunities are growing and diversifying given the presence of mining activities; and
- the inability for households to carry on with their activities for reasons out of their control but in direct connection with mining activities (loss of croplands, land pressure, poorer yields, etc.).

This indicator is calculated based on household declarations.

12.8.2.19 *Average annual income per CU*

The income per consumption unit is a valuable indication of household wealth. It is used to assess the increase or decrease in living standards and highlights the inequalities that may be present in an area. Such indicator shall be carefully

[1] The notion of drinking water may greatly vary from one country to the next, and includes many criteria such as taste, smell, turbidity, etc. From a sanitary standpoint, the notion of drinking water actually consists in determining whether water may be drunk or not.

considered since it may greatly vary based on commodity prices in an area heavily relying on agriculture.

The money income of a household gives little information on its actual wealth. For instance, between a household with five members and a household with twenty, a same income will not account for a same opportunity for the two households. The individual income therefore conveys a higher level of information. However, with the data gathered, it is possible to go more in-depth, i.e. calculating the number of consumption units per household. An individual aged 10 years old is not the same burden as an individual aged 25. The Oxford index is used to calculate the number of consumption units per household. This index considers the number and age of household members. The first adult accounts for 1 CU and the others for 0.7. Children under 15 account for 0.5 CU.

The income per consumption unit is therefore the household income during a 12-month period, divided by the number of consumption units in the household. This is the profit generated by the household related to a consumption unit. The disposable income of the household incorporates several elements to be added up:

- the income of the household deriving from agriculture: it is the value of cultivation, breeding and crafts activities minus intermediate expenditures (costs of labor, rented out land or equipment, potential inputs, etc.). For all these items, the income includes the production sold and the production intended for self-consumption, valued in Guinean Francs;
- the income generated by other activities (use of natural resources, employed or self-employed jobs);
- the income generated by rented out equipment (land, tools, vehicle, etc.); and
- pensions, money transfers, donations, etc.

In-kind incomes were all valued in Guinean Francs based on the commodity prices observed on local markets in July and August 2014.

12.8.2.20 *Share of the money income per CU*

This indicator gives information on the vulnerability of households and their ability to improve their living conditions (especially in terms of comfort and durable goods). It is obtained by calculating the share of money income expressed as a percentage of the disposable income of a household.
As it is the case with the average annual income per CU, this indicator is sensitive to commodity price trends.

12.8.2.21 *Share of agricultural production in household incomes*

The presence of the mining project attracts many immigrants in search of new economic opportunities. Although the area is now predominantly involved in

agriculture, its economic structure may be modified based on the progress of the mining project. Activities in the secondary and tertiary sectors should sharply increase. The share of the agricultural production in the money income is used to identify the economic strategies implemented by households.

It is calculated based on the household money income with the production intended for self-consumption valued in Guinean Francs.

12.8.2.22 *Share of the mining sector in household incomes*

This indicator is used to assess the economic spin-offs of mining jobs within the households in the area. It is calculated based on the household money income derived from the mining sector.

12.8.3 *Summary table*

All the indicators calculated for year 2014 were reported in a single summary table, as shown in *Table 12.20* below.

Table 12.20 Summary table for t0 (2014)

	RA	IA	MA
Number of inhabitants	8,084	9,702	17,786
Average size of a household (individuals/household)	6.6	7.0	6.8
Population under 15 (%)	44.8	46.2	45.6
Migrant population (%)	56.6	16	35
Population density (inhabitants/km²)	115.5	23.2	36.4
Share of property owners (%)	80.5	95.9	88.4
Share of the population holding a land title (%)	26.2	4.7	14.0
Number of individuals per room	3.2	3.6	3.4
Housing quality composite index	1.7	1.5	1.6
Durable goods composite index	3.1	2.4	2.7
Enrolment rate in primary school	53.2	42.8	47
Rate of literacy in French (%)	24.6	16.3	19.9
Access to modern medicine (%)	71.6	63.8	67
Satisfaction with the health of heads of households	3.7	3.8	3.7
Access to a modern water supply point (%)	16.2	16.4	16.3
Satisfaction with the access to quality water	3.0	3.0	3.0
Use of latrines (%)	70.3	35.9	52.6
Population in the primary sector (%)	65.5	74.9	70.7
Average annual income per CU (GNF)	5,062,864	7,557,184	6,511,822
Share of the money income per CU (%)	67.76	61.54	63.56
Share of agricultural production in household incomes (%)	50.8	72.7	65.6
Share of the mining sector in household incomes (%)	4.4	1.4	2.4

12.9 *SUMMARY OF THE SENSITIVITIES IN THE MINE AREA*

Table 12.21 summarizes the main socio-economic sensitivities identified in the MA. These findings are based on field observations by the baseline study team

and the review of the data deriving from all the surveys carried out (both quantitative and qualitative).

The purpose of compiling the main socioeconomic sensitivities in the MA is to prepare the impact assessment, indicating a certain number of issues to which specific attention should be paid, especially as part of the consultations carried out with the population.

These sensitivities were rated, as a reference (qualitatively based on specialist's' view and expertise), based on their degree of importance (from 1 (low) to 5 (high)).

Table 12.21 Socioeconomic sensitivities in the MA

Issues	Sensitivities	Rate
Urbanization of the area along the road	- Rapid population growth along the road and changing socio-demographic structure	3
	- Concentration of the population in cramped spaces in an increasingly uncontrolled manner	2
	- Pressure on basic infrastructures (water supply, education, healthcare)	3
	- Harder access to croplands and housing plots	3
	- Impoverishment of immigrant populations and emergence of a class	2
Governance	- Different overlaps of administrative and customary boundaries	1
	- Coexistence of administrative and customary powers potentially triggering conflicts in terms of jurisdiction or interests	3
	-	
Land tenure	- Unequal distribution of land, dependence between lineages and/or villages	3
	- Ambiguity between some land statuses (unlimited lending and transfer) that might trigger conflicting claims	2
	- Increasing surface of croplands: decreasing surface areas for annual crops, reduced fallow time, decreasing yields	3
	- Increasing land pressure: harder access to land for "dependent" populations: end of unlimited lending schemes, emergence of tenants, potential exclusion of vulnerable populations	3
	- Property commercialization, an emerging practice outside the customary system, yet not fully supervised/regulated by the modern system: potential conflicting claims between purchasers and customary figures.	2

Issues	Sensitivities	Rate
Social relations	- Tensions between Wossou and Soucka and their related villages: livestock theft, land grabbing, religious tensions under the influence of the mosque, etc.	3
	- increasing number of conflicts between herdsmen and farmers	2
	- Conflicting claims regarding the founding of villages (history, status of its founder, etc.) in the eastern portion of the mine area	1
	- Emergence of a social hierarchy with the better-off (Fula nobility) and the worse-off (Poulis, captives, etc.) in the eastern portion of the mine area	1
Cultural heritage	- Non-replicable nature of the cemeteries within the area	3
	- Historic significance and regional influence of the Wossou mosque and cemetery	3

Source: INSUCO

As far as possible in the local culture, sensitivities and conflicts are settled amicably and mediation and dialogue are encouraged so as to prevent the severance of social ties. Populations would rather turn to local representatives of the traditional/religious chieftainship. Only when conflicts cannot be settled at the level of the village, formal governance structures, i.e. Districts, Communes and devolved authorities are sought. For such purpose, these structures include a Council of Elders which objective is to facilitate the dialogue among stakeholders involved in a conflict and work toward social peace.

Most of the time, people do not involve the police or judicial system since these authorities are often in distant locations and associated costs to involve them are steep (administrative or/and travels costs).

13 SOCIAL BASELINE STUDY - PORT AREA

13.1 KAMSAR

13.1.1 *Urban dynamics*

The Boké Prefecture is divided into 10 Sub-Prefectures among which the Kamsar Sub-Prefecture is the largest. Kamsar is located in the Rio Nuñez estuary, along the Atlantic Ocean. It is located some 300 km from the national capital Conakry and 50 km from the capital of the Boké Prefecture.
This former fishing village and its suburbs have grown since the industrial centre operated by *Compagnie des Bauxites de Guinée* (CBG) was developed in the 1970s.

Figure 13.1 Port study area



The town accommodates the CBG facilities which mainly include a bauxite drying and crushing plant and an ore tanker port terminal. A railway spur connects the bauxite plateaus in the Sangarédi area with the port facilities in Kamsar. These facilities currently operated by CBG are owned by *Agence Nationale d'Aménagement des Infrastructures Minières* (ANAIM, a public industrial and commercial body). As part of the current CBG activities, six trains run from the Sangarédi area to Kamsar on a daily basis. A passenger train connects Sangarédi with Kamsar once a week. Kamsar is crossed by an asphalt road in good condition.

Its rapid growth is observed along the railway from west to east, as the town is bordered to the north and south by mangrove areas. Kamsar currently extends over more than 10 km. However, development is uneven. It relies on a "Center-Suburb"spatial organization in terms of economy, land management or access to basic services. The development of Kamsar has always depended on its geographical location and the presence of mangrove areas to the north and south, where no development project is possible. Kamsar grows from west to east following a linear pattern.

In addition to the urban area, the Project area extends southwards and toward the Districts of Taïgbé, Kouffin, Binari and M'botiny, islands with rural populations that are only accessible crossing several river branches by canoe.

The town comprises:

- A center, in the urban district *Kamsar Cité*. This is the CBG footprint. The main economic activities and services are located there; most commutes are to and from this area. Living conditions (mainly in terms of access to basic services: education, water supply and electricity) are better than in the other areas and the socioeconomic level is fairly high compared with the remaining part of the town. Two areas however constitute an exception: *Bas-fonds* and *Camp-Balanta*.

- A first suburb encompassing the districts of *Kamsar Centre*, Filima and Kassongony. Its existence is directly due to the polarity of Kamsar Cité. As such, it is characterized by varied economic activities, land management ruled by modern law, high-density housing and existing but poorly functioning basic infrastructures.

- A second suburb encompassing the districts of Madina Borbof and Kawas (Manoyiré area close to the airport). It is essentially a rural area in full transition. People are mainly involved in agriculture, although activities tend to be increasingly diversified, land management is both ruled by customary and modern laws, housing is getting denser but there is still a lack of infrastructure.

- The sand platform built by in 2009-2010 and located at GAC's port concession; this platform will be used to develop bauxite export facilities.

- The village of Taïgbé is the largest in the port area with a population estimated beat 2,000 inhabitants in 2008 (*Knight Piésold Consulting*, *Executive Summary, 2008*). From Kamsar, Taïgbé is only accessible through a small dirt track, then a stretch of river must be crossed by canoe to reach the village (*Section 13.1.8*).

13.1.2 *Demographics and social features of the population*

Opening both to the ocean and to inland areas given the presence of an asphalt national road, Kamsar is a major hub at the sub-regional level.

Within 40 years Kamsar has changed from a small village with a dozen households (Baga and Landoma people) to a booming town with a population exceeding 100,000 inhabitants. The preliminary results of the census conducted by the Government of Guinea for the year 2014, estimate the population at 113,108[1] inhabitants. These results should be revised upwards regarding to the estimates which have been done by different actors as ANAIM or the sub-prefecture (they estimate the population around 380,000 inhabitants). In 2006, some estimates were already higher, with about 179,000 (*Knight Piésold Consulting, Executive Summary, 2008*), while a study led in 2013 estimates the population around 156,200[2].

The current population of Kamsar is the fruit of a significant cultural melting pot of several ethnic groups from various regions of Guinea and neighboring countries (Susu, Fula, Mandinka, Guerzé, Kissi, Toma, etc., and of course Baga and Landoma). The ethnic origin of most people living in Kamsar is Susu, then Fula. The population in Taïgbé is mainly Baga.

The first language is Susu. The main religions are Islam (the main one), Catholicism and animism.

The population of Kamsar is mainly young, reportedly with a third of inhabitants under 9 years old. There are more men than women, which is mainly due to the presence of migrants in search of job opportunities (*Knight Piésold Consulting, Executive Summary, 2008*).

Vulnerable groups of people identified in the Port Area include children, single women acting as household heads, the elderly, and people in poor health.

13.1.3 *Power, governance and civil society*

Kamsar is the most populated Sub-Prefecture in the Boké Prefecture. The authorities of the SP and Commune have a strong legitimacy with the population. Heads of districts are key figures of the local governance as they are continuously in touch with the local populations. In the urban area, traditional authorities still have a key position. Their legitimacy is even stronger in the

1 http://www.geohive.com/cntry/guinea.aspxhttp://www.geohive.com/cntry/guinea.aspx date consulted

2 Sona Mady Camara (AMERI). Socioeconomic study on the establishment of a refinery at Kabata-Kamsar (2013).Prepared for Alcoa-Rio Tinto Alcan

villages surrounding Kamsar, and especially in those located to the south of the town, behind the future GAC facilities. Social tensions and conflicts in Kamsar are recurrent (and sometimes very violent) and almost systematically related to the access to water and electricity (provided for free but on an uneven basis by CBG) in central and suburban areas. A large number of regional and national NGOs and organizations have an agency or their head office in town.

13.1.4 *Access to basic services*

13.1.4.1 *Urban planning*

The Kamsar Sub-Prefecture is divided into 14 districts including 4 on islands. The town of Kamsar is organized around the "Kamsar Center" district, where the CBG workers housing complex is located. The spatial organization and good conditions of access to basic services are the fruit of an effective urban planning scheme that was developed and funded by CBG for a small part of Kamsar: detached houses, public gardens, recreational areas, school transport, regional hospital, asphalt roads, electricity and water supply.

13.1.4.2 *Healthcare*

Healthcare facilities are quite common in Kamsar. There is one hospital, one healthcare center and 17 private centers. However, access to healthcare still is an issue. It depends on the socioeconomic level of populations: the greater the financial resources of a household, the more it may have access to quality services.

The Kamsar hospital (150 beds, 23 doctors, 60 paramedics), and mining towns are managed by ANAIM with CBG funding. The Kamsar hospital is a public structure praised at the regional level for the quality of its services. Although consultations remain free for CBG employees and their families, consultation and hospitalization costs are fairly expensive for the rest of the population.

The main diseases affecting the local populations are malaria, diarrhea, tuberculosis, tetanus and respiratory diseases (asthma, bronchitis). The issues associated with HIV/AIDS and other STDs are also prevailing in the Kamsar area. As a mining and port area, it may attract many single men, thus leading to the coexistence of several STD transmission risk factors (risky behaviors).

13.1.4.3 *Social infrastructures and demographic pressure*

Over the years, CBG has heavily invested in social projects (schools, healthcare centers, water and power supply networks),but many of these facilities have become insufficient given the current population growth, or fairly dilapidated through lack of regular maintenance. Such investments, mainly in water and power supply in the urban area, offer a good level of comfort to the people living in the workers housing complex of Kamsar (access to electricity far higher than in many towns of Guinea). Although such networks supply

electricity to other areas in these towns, there is no continuous supply in central and suburban areas (power cuts in the center and no coverage in the suburban areas, discontinuous water supply in the CBG network, lack of wells and pumps in the suburban areas). Over the years, the growth and densification of the town have led to deteriorating access to water and power supply for most part of the population. Power (free electricity provided by CBG) and water supply in Kamsar center, although unsatisfactory, encourage people to concentrate in and around this district. Such urban dynamics contribute to an ever-greater densification in the central districts.

As a matter of fact, a few kilometers from the mining town, Kamsar extends over several districts (Kawas, Madina Borbof, Filima, Kasongoni), along the main (asphalt) road to Boké and the railway line. These districts are highly populated and waiting times to have access to functioning basic services are lengthy (water/electricity). They sometimes led to clashes between the population and police forces, as it was the case in 2009 and 2012.

As far as safety issues are concerned, social conflicts between the population and police forces regularly break out regarding water and power supply issues in the central districts of Kamsar.

13.1.4.4 *Education*

In the Kamsar Sub-Prefecture, the literacy rate remains low with 33% on average for women and 55% for men (*Knight Piésold Consulting, Executive Summary, 2008*).

In Kamsar, as in any other town in the country, education is both public and private. Teaching and learning conditions in private schools are generally better than in public schools (number of pupils per classroom), however the costs to be incurred by families are often steep, given their income level and number of children per household. There are some 50 primary schools and 15 secondary schools.

Public primary education is available in the village of Taïgbé and some villages further to the south. Conversely, pupils going to secondary school who are not living in Kamsar have to walk and take the canoe on the river Dougoufissa morning and evening.

The closest higher education institutes are located in Boké: the vocational training center, the community healthcare training school, primary school, teachers training school and higher institute of mines and geology (financially supported by CBG).

13.1.5 ***Land tenure***

The town of Kamsar is densely populated. Land pressure is significant with a growing gradient from the suburbs to the center. Opportunities to purchase

plots of land are very limited and associated costs are significant since all the inhabitants wish to live in central districts so as to have access to water and power networks.

The villages located to the south of the future port facilities are mainly rural. Their economy heavily relies on mangrove rice production and fishing. The road located between the CBG plant and the future Project port facilities (*Section 13.1.8*) is the only way to access to the plots of land located on both sides of the new conveyor system and represent a key communication route for maintaining the economic outcomes of these villages

13.1.6 *Economy*

Kamsar is the second largest industrial and economic port behind Conakry. The economy in the Kamsar area essentially focuses on four sectors: direct and indirect jobs with CBG, trade and services, agriculture (market gardening, mangrove rice cultivation, perennial and annual crops) as well as artisanal and semi-industrial fisheries.

A significant part of the coastal population, both urban and rural, relies on a combination of activities organized around fishing and agriculture. Fisheries are a source of income for fishermen and many women who smoke and sell fish. Many women married to former CBG workers smoke fish to increase their household income.

At the Kamsar pier, fish smokers are well organized and they provide their clients with other products in addition to fishery products from the area. They collect products and supply a commercial network that may be situated at the national and international levels, way beyond the fishing capacity of these estuarine fishermen. They have taken advantage of the construction and fitting of smokehouses at the Kamsar port. The kilns used (*chorchor*) are enhanced since they are fuel efficient.

In the Kamsar area, there are an increasing number of people (sometimes coming from Conakry and neighboring countries such as Senegal and Sierra Leone) relying on fishing in the two small ports of Kamsar: Port Fory and Port Néné.

The native village of Taïgbé was founded long before CBG arrived in the area. Rice cultivation is the primary activity and households are also engaged in subsistence fishing. They are mostly rice growers-fishermen with a seasonal fishing activity. Fishermen do not invest much: they do not have motor boats, investment equipment is limited. Fishing activities are carried out during all the favorable seasons to feed their households and surpluses are sold on the market.

Agriculture

Mangrove rice cultivation is one of the main activities of the populations living to the south of Kamsar, beyond the river Dougoufissa (Districts of Taïgbé, Kouffin, Binari and M'botiny). Many rice cultivation units are developed and cultivated each year on the Taïgbé island, mainly in the place known as Kassoussou, right to the south of the physical footprint of the future Project conveyor system. Mangrove rice cultivation significantly differs from rain-fed rice cultivation practiced in the rest of Guinea. Plots are surrounded by small bunds used to bring in or discharge water.

These units are interspersed with areas used for the production of salt, an activity taking place during the dry season, following rice harvesting and which is also significant in terms of money income for the people living on the southern islands.

The populations living on the southern islands and in the Kamsar suburbs are also engaged in market gardening and horticulture for commercial and subsistence purposes. These activities mainly involve inhabitants of Kamsar, in the area nestled between the CBG facilities and the future GAC conveyor system, where mango trees, banana trees, cassava and maize fields or market gardens are located. Cashew and oil palm trees are key perennial crops on the Taïgbé island.

Small ruminant and pig breeding involves some people living in the villages located on the islands to the south of the SP, mainly for self-consumption. Livestock breeding is virtually nonexistent on the islands. Given the distance between the villages and the Project footprint, impacts on breeding activities will be negligible.

Recreational activities

A small beach has been identified on the east of Taïgbé for local recreational uses at specific occasions (public holydays). It has not been used the last years due to the Ebola context.

13.1.7 ***Use of natural resources***

Surface water

In Kamsar, the population depends both on CBG, hand pumps and traditional wells for drinking and sanitary water. Access to drinking water (network) is a high expectation for the suburban population.

On the southern islands, water is mainly abstracted from water bodies and traditional wells dug by the population. However, CBG set up a network running to the village of Taïgbé. It crosses the river Dougoufissa at the location of the future conveyor system.

Fishing

In addition to the mining industry, the economy in the Kamsar SP is mainly focused on fishing, organized around an artisanal sector and a semi-industrial sector.

The activity is a source of income for both fishermen and the many women involved in fish processing (drying, smoking) and their commercialization. Two main ports, Fory and Néné concentrate the fishing, processing (smoked fish), transport and trading activities.

Port Néné is one of the largest fish landing areas on the Guinean coast. Infrastructures are well developed there: quay, ice plant, cold rooms, fuel depot, smokehouses, workshops, etc. Nearly 400 small motor boats and 1,600 fishermen move around the port. Fishing both takes place in inlets and the Rio Nuñez estuary, and on the coastline and open sea, depending on the season and weather conditions. Most catches are smoked and sold (activities involving some 200 women). A small quantity of fish is sold fresh. The largest quantities are exported to the rest of the country and neighboring countries.

Systematic incursions by industrial trawlers into coastal areas and water quality degraded by urban discharges are among the concerns voiced by industry stakeholders.

On the islands located to the south of the future Project facilities, a large number of fishing camps can be encountered. Fishing is more artisanal, fishermen virtually have no motor boats and investment is minor. Fishermen who more often settled in camps on the banks of the estuary mainly fish in the coastal areas and rivers meandering in the mangrove. Catches are intended for self-consumption and surpluses are smoked by women and sold on the local market and seldom to the organizations in charge of exporting fish to the rest of the country and neighboring countries.

Fishermen from the southern islands seldom dock and sell their catches at Port Néné. Commercial transactions mainly take place at the canoe landing stage on the river Dougoufissa for the inhabitants of Taïgbé, sometimes on the N'sara market in the heart of town. Apart from the people living in the sectors of Falaba, Kaloum (Taïgbé District) and Kandouma (Kouffin District) who may directly go to the small port of Bendougou and then reach the District by land to finally arrive at the weekly market, all the inhabitants on the southern islands depend on the Salamaya port for the transport and commercialization of their production. This port is located near the future rail spur, between the CBG and GAC facilities.

Other activities

Hunting and gathering activities seem to be fairly limited on the islands and in Kamsar. However, there is an issue regarding wood harvesting, especially

mangrove-sourced wood used for domestic activities (cooking) and for two of the main economic activities of the area: fish smoking and salt production. On the Taïgbé island, the closest to Kamsar, it seems that wood is now only harvested for local salt production and individual uses. By contrast, on the islands located further to the south, mangrove wood harvesting is a significant source of income. Wood harvested there (firewood and timber used in carpentry and to make boats) is mainly sold at the Salamaya port.

The social sensitivity regarding access to natural resources is high in the PA, since many households living in Kamsar and on the islands further to the south rely on fishing activities.

13.1.8 *Mobility, flow and transport*

The town of Kamsar is connected with the rest of the country through an asphalt road in very good condition. Port Fory, the fishing port of the town before Port Néné was created, is now dedicated to transport activities. About a hundred vessels transport passengers and goods between the coastal towns of Guinea and neighboring countries (Senegal, Gambia, Guinea-Bissau, Sierra Leone, etc.).

Most people living on the Taïgbé island directly walk (or cycle) to Kamsar, taking the pirogue that crosses the river (approximately 300 meters) Dougoufissa at the location of the future conveyor system. Then, they have to follow a track for 1.3 km between the CBG plant and the future Project port facilities. Carriers (cars and motorcycles) sometimes meet people coming from the island at the ferryberthing area. Collectors also go there to buy products from the islands (rice, smoked fish, salt, varied crops).

People living in the sectors of Falaba, Kaloum (Taïgbé District) and Kandouma (Kouffin District) go by boat to the small port of Bendougou and by land to Kamsar, via the Filima District.

The other people living in the southern islands (Kouffin, Binari and M'botiny Districts) rely on the Salamaya port to travel from and to Kamsar, as well as to transport local products to be sold: rice, fishery products, salt, varied crops, firewood and timber. The port is a small undeveloped pier where fishing and transport boats berth at high tide. It receives a dozen vessels including 6 for the transport of passengers (100 to 150 passengers per crossing), 14 for goods and 18 only for wood. There are also around 30 tradesmen negotiating the prices of the goods brought by the populations of the southern islands and a boat making workshop. The location of the Salamaya port is strategic because it is very close to the main market in Kamsar (N'sara market) and town center. It is however cut off by the ANAIM railway.

13.1.9 *Cultural heritage*

No new inventory of cultural heritage sites was carried out in the Port Area following the Resettlement Plan implemented in 2005 and 2006 for the initial marine terminal platform and trestle development. According to consultations with the Taïgbé authorities, no significant site is reportedly located in the direct vicinity of the physical footprint of the future Project facilities. The closest site would be the residence of a genie in the place known as Kassoussou, more than 100 m from the future conveyor system.

As anywhere else in Guinea, the social sensitivity associated with cultural heritage is high for the local populations.

13.1.10 *Living environment and landscape*

The PA encompasses the Kamsar urban area, the CBG industrial complex, the Rio Nuñez estuary as well as mangrove areas, rice-growing and salt-producing areas and agroforestry areas around fishing camps and villages located on the islands to the south of the future Project facilities. The landscape and living environment are therefore diversified.

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14.1 SOCIAL IMPACT ASSESSMENT TIMEFRAME

Fieldwork related to the social impact assessment study was carried out in two separate phases. During the first phase (October 2014), the health situation in Guinea did not allow the team to travel to the Port area at Kamsar.

The social impact assessment community consultations in the Mine Area (MA) were limited to those located in or near the direct footprint of the Project in the Sub-Prefecture (SP) of Sangarédi, and on and around plateau 34 in the SP of Tanéné.

During the second phase of social impact assessment (February-March 2015), the team travelled to Kamsar to engage with stakeholders locally.

At this second phase of the assessment, the GAC SA bauxite export project description had changed significantly from the description available during the first phase of the process as follows:

- extension of the ore extraction area to plateaus 20, 24, 26, 27 and 31;
- successive mining of the plateaus, from the north-west (Districts of Tanéné Centre and Dambantian) to the east (Districts of Wossou, Soucka and Balandougou); and
- clarification on the future facilities design (crusher, ore stockpile and loading area, etc.) to the north of plateau 26.

During the second phase of the assessment, the teams thus consulted with communities located on and near plateaus 20, 24, 26, 27 and 31 to inform them of the changes to the project description.

The impacts have been identified and assessed to consider to higher potential impacts based on existing data.

14.2 DELINEATION OF THE STUDY AREA

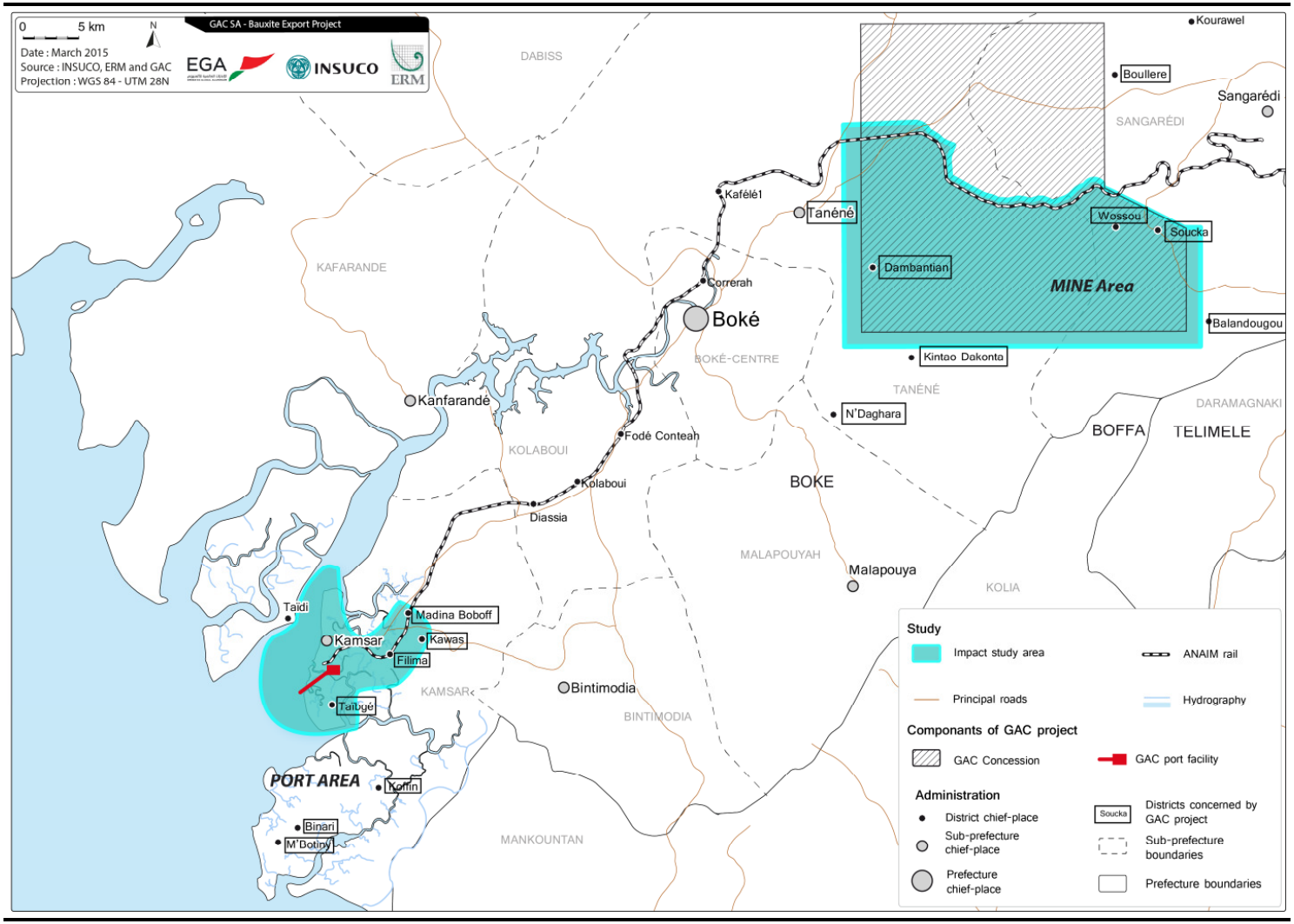
14.2.1 General study area

Figure 14.1 gives an overview of the study area, divided into two sub-areas:

- The mine area (MA) includes all the villages located in the study area of the socioeconomic baseline study (on and around plateaus 20, 24, 26, 27, 31, 32, 33, 34 and 37.).

- The port area (PA) includes the islands in the Kamsar Sub-Prefecture to the south of the GAC Project's future plants, the section of the estuary of the Rio Nuñez located downstream of the Project, and the city of Kamsar.

Figure 14.1 Project-wide study area for the social impact assessment



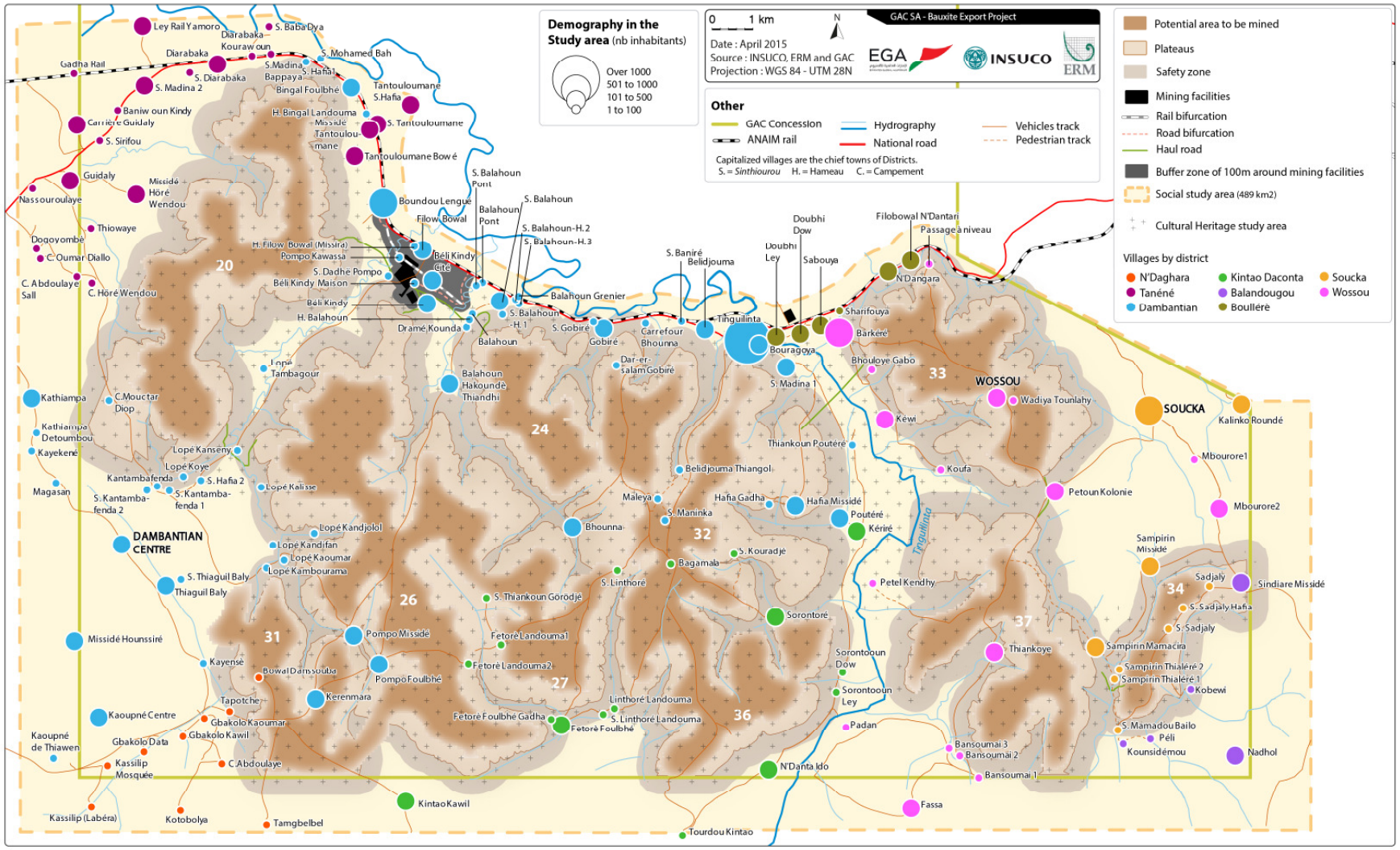
14.2.2 Mine area

The mine area is essentially rural and is located across the Rural Communes (RC) (which corresponds to two Sub-Prefectures) of Sangarédi and Tanéné, physically and administratively separated by the river Tinguilinta. Both are connected to Boké Prefecture (Administrative Region of Boké).

The mine area contains a total of 155 settlements as well as camps of cattle herders with a total population estimated at 17,786 inhabitants in 2,610 households. The largest settlement, Tinguilinta has 1,054 inhabitants while the smallest hamlet, Balahoun Grenier, only has one inhabitant.

Figure 14.2 presents the study area of the mine, including the Project footprint and community settlements.

Figure 14.2 Study area of the mine area



14.2.2.1 *Social "area of influence" at the mine*

For the purpose of assessing potential impacts, an Area of Influence (AoI), referred to as Safety Zone, has been developed based on the estimation of distances around the planned Project facilities and activities within which Project impacts may have an effect on social receptors. Impacts are differentially considered depending on whether they arise inside or outside this area. The Safety Zone is therefore to be considered as a study area within which the Project future infrastructures and activities may affect inhabitants and human activities and used as a geographical limitation to the impact assessment process. These distances will be taken into account to determine buffer zones as mitigation measures in the SEMP where Project activities will not take place.

These distances are indicated on *Figure 14.2*. They are also included on each of the thematic maps presented in the body of the report. They are defined as follows:

- 500 meters around the boundaries of the bauxite plateaus for all of the social themes. This distance takes into account:

  - the mining footprint and loss of access to resources within mined pits ;
  - a safety distance to human presence during blasting activities of 800 meters from blasted area (areas located inside of the plateaus and therefore expected to be within the 500m Safety Zone from the plateaus boundaries);
  - potential noise and air quality nuisances generated by haul roads and by the mining itself; and
  - a potential reduction in access to natural resources and presence of wildlife fauna around the edges of the mining plateaus; and

- 100 meters around process facility and other mining infrastructure in the mine area (rail spur, processing facility, and access roads) taking into account de facilities footprint and loss of access to natural resources within its boundaries and potential noise and air quality nuisances generated by the mining facilities.

14.2.2.2 *Cultural "area of influence" at the mine*

A specific area is also defined for the study of the cultural heritage sites, which comprises the mining infrastructures and the bauxite plateaus, including a distance of 300 meters around the Project components and the valleys separating each plateau, where it can be assumed that several haul roads will be opened. Within this "area of influence" it is expected that cultural sites may be affected by the Project footprint or experience a reduction in their perceived value by stakeholders as a result of noise, visual impacts, or reduction in accessibility.

14.2.3 Port area

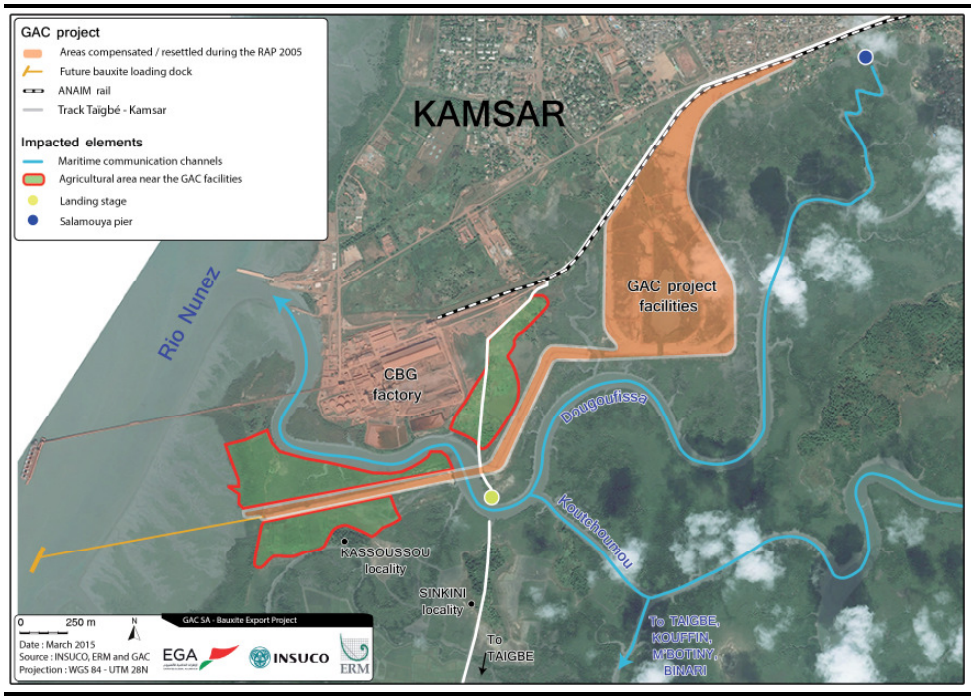
The "port area" includes the city of Kamsar, the settlements located in the Sub-Prefecture to the south of the urban areas and part of the estuary of the Rio Nuñez. This area takes account of the construction works of the mining terminal and the port, the dredging activities of the Rio Nuñez, the rail spur to the port terminal, and a housing complex for the Project's management staff (location still being defined) and the construction of living quarters for the workers (within the perimeter of the port terminal).

Figure 14.3 shows the Port study area and illustrates the area of the impact which therefore includes a marine and a land component. The islands to the south of Kamsar have been included in the study area insofar as they might be impacted if the processing facility were to disrupt the traffic on the watercourse, which connects these islands to the Salamouya pier.

Figure 14.3 Port study area



Figure 14.4 Zoom on GAC project footprint



14.3 IDENTIFICATION OF SOURCES OF IMPACTS

14.3.1 Consultations on the impacts

14.3.1.1 Consultation methodology

In order to provide reliable and accurate information on the baseline socioeconomic context, the study included a continuous process of consultation with the communities in the Project area. This started during the scoping study (making contact according to the Stakeholder Engagement Plan (SEP)), followed by further consultation during the baseline studies (history of the settlements and lifestyles). This consultation helped to inform the SEIA regarding community concerns and expectations in relation to expected impacts from the Project.

14.3.1.2 Summary of the consultations carried out

Table 14.1 summarizes the consultation held with the authorities during the study, over the entire Project area.

Table 14.1 Summary of administrative levels engaged during the consultations

Prefecture and Urban Commune	Sub-Prefecture and Rural Commune	Districts
Boké	*Sangarédi*	Boulléré Wossou Soucka Balandougou
	Tanéné	Dambantian Kintao Daconta Tanéné Centre
	Kamsar	Kamsar Centre Kassongony Taïgbé

Following the framework of the SEP the stakeholders below were consulted:

- GAC's departments representatives;
- various prefectoral and sub-prefectoral technical departments (water and forests, fishing, rural development, promotion of women and children, education, work inspection, control and quality, etc.);
- the port authorities of Néné, Fory and Salamaya;
- the national security forces (gendarmerie);
- the personnel of the healthcare and education infrastructure;
- private contractors (CSS, Laguipress); and
- representatives of civil society organizations (health and hygiene committee, Islamic league, youth associations, NGOs – CEFACAM, ASDS, WCF, INAASPO, ACOSOF, CADI – etc.).

Over the course of the SEIA, about fifty consultations with more than 1,900 people over the age of 15 were carried out in the communities of the Mine area. Almost 20% of the total adult population recorded were informed and consulted on their concerns and expectations concerning the GAC Project (see *Annex 14.1 Consultations process and summary of consultations*).

During each of the consultations carried out as part of the impact study mission, more than 1,900 respondents residing in the study area of the mine were interviewed on their level of knowledge of the GAC Project and on their sources of information.

14.3.1.3 Degree of information of the stakeholders consulted

The level of information of the communities on the project was divided into four categories:

- A community is considered as not informed when no one has heard about GAC SA and its industrial project during the consultation.

- A community is poorly informed when it knows the company exists, but does not know its area of activity.

- A community is semi-informed when it knows the mining company and the bauxite mining Project.

- A community is well-informed when its members know that the company is going to give priority to the mining of the bauxite plateaus of the south of the concession following the postponement of the bauxite refinery Project in the District of Boulléré.

Almost half (47%) of the communities met during the consultation carried out in the settlements of the mine study area in February and March 2015 were semi-informed about the GAC Project. Thirteen percent were well-informed and 40% poorly informed. All communities had at least heard about the company before the consultation on impacts.

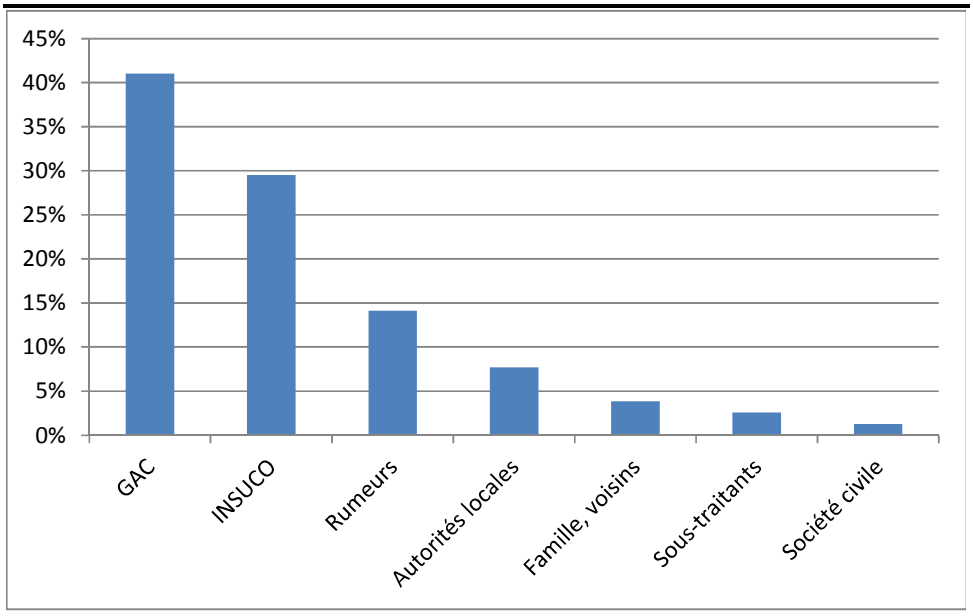
This level of information is however relative and must be compared with the degree of information expected by the consulted populations. Thus, during the community consultations of October 2014, almost three-quarters of the people consulted said they were "not informed". This number illustrates a general feeling of frustration of the communities with respect to the communication carried out by the company on its Project in the Mine area.

In general, the most poorly informed people were women and the elderly. On the other hand, the male representatives of the administrative and traditional authorities were the best informed. A north-south gradient was also observed regarding the level of knowledge of the Project, with the persons based in the settlements and the hamlets close to the national road being better informed than the inhabitants of the most isolated settlements and hamlets in the south of the concession.

In the same settlement, or during the same meeting with different authorities, the stakeholders who stated they were well, semi or poorly informed cited several sources of information. Most of the information obtained by these people directly came from the representatives of GAC. The prefectoral, sub-prefectoral and communal authorities said they had attended regular information meetings with the representatives of the company. In the settlements, the meetings organized by GAC to demarcate the plateaus in the concession were often cited as the only meetings held with GAC representatives. However, the presence of Community Liaison Officers (CLOs) of the company was only spontaneously mentioned in one community (Kantabafenda).

Several inhabitants of the settlements cited Insuco as being their main source of information (while conducting social baseline studies). Finally, a minority of inhabitants of settlements mentioned their local authorities, their family and friends or even rumors (including those spread by the GAC workers and their subcontractors) as sources of information.

Figure 14.5 ***Sources of information on the project stated by the stakeholders consulted (mine area)***



Translations:
Rumeurs: rumors
Autorités locales: local authorities
Famille, voisins: family, neighbors
Sous-traitants: subcontractors
Société civile: civil society

14.3.1.4 *Main concerns, expectations and recommendations expressed by the stakeholders consulted*

Each of the consultations was registered.

Figure 14.6 shows the main concerns stated by the stakeholders consulted during the impact study mission (categorized by major social themes):

- at the top: concerns systematically mentioned (number) and whose significance was heavily emphasized by the communities (level);
- in the middle: concerns often mentioned and whose significance was emphasized by the communities; and
- at the bottom: concerns mentioned on a few occasions and whose significance was emphasized by the communities.

Figure 14.6 Main concerns raised by stakeholders consulted

Socioeconomic	Land tenure and resource areas access	Health and Safety	Power and Governance	Cultural Heritage	Social dynamics and demography	Education
Loss of livelihood goods (sold and self-consumed products) and impoverishment of communities	Spaces loss of land for cultures and farming	Decline in access to safe drinking water (drainage and pollution of water, pressure on infrastructures)	Risk of conflicts and social tensions if the company doe not recruit locally	Arrival, in the communities, of geniuses disturbed by GAC activities	Dependent family based solely on women if men can no longer work	Pressure on the education infrastructure in case of massive influx of foreigners
No access to employment in the project	Degradation of access to natural resources (surface water, hunting, fishing, gathering, building materials etc Pharmacopoeia)	Strong disturbances (noise, projectiles, dust) related to project activities	Lack of communication	Destruction of cemeteries an disappearance of generationa continuity		Lack of access to education for in case of loss of income and / or isolation of villages
Resettlement in areas that do not offer the same opportunities as the initial state	Pollution of rivers and the sea, with degradation of fishery resources	Pressure on water resources and health infrastructures following the arrival of migrants		Destruction of places of worship		
Compensation not matching the injury suffered		Noise (trains passing and vehicles)				
Long rehabilitation, not allowing to have immediately profitable crops	Need to migrate to survive (economic displacement)	Isolation of villages, loss of access to health centers	Pressure from local authorities to ensure that communities do not complain in case of problems (eg loss of livestock)		Massive arrival of foreigners forcing PAPs to share their lands, resources and infrastructures	
Sharing of land (and therefore of revenue) between host and displaced populations	Dissatisfaction of traditional authorities loosing power over the land	Diseases following inmigration	Tensions generated by the flow of migration, mismanagement of these flows			
Rehabilitation that does not reconstitute all initial economic opportunities	Flooding and pollution of rice fields in the southern islands of Kamsar	Insecurity related to immigration and the increase in the unemployment rate	Tension between displaced and host population in case of unequal treatment in compensation			
Isolation of villages: flow problem for the production	Disappearance of livestock (grazing loss and increased traffic)	Disappearance of medicinal plants	Removal by local authorities on compensation for local population			
Decrease in profitability of the crops affected by the dust	Cumulative impacts : loss of resource areas nearby concessions	Inability to pay for medical expenses in case of loss of income	Failure by the mining company to keep its promises and respect Guinean laws		Unable to receive foreigners with dignity	
Poor working conditions in subcontracting companies	Diversion of transhumance routes	Fires				

Concerns regarding the loss of access to land

Land development is considered the main and often the only means of subsistence of the rural communities. Issues related to the loss of access to land came out as the main concern around the Mine Area. Local employment of youth is perceived as the only valid compensation for loss of these resources by the rural communities. The fear of losing access to land without their youth being recruited by the company is linked with the fear of increased economic pressure on women, who would become solely responsible for the subsistence of the household.

There is widespread mistrust regarding the effectiveness of compensation on the restoration of living standards of families, in the medium and long terms. In the event of physical displacement, the persons met questioned the possibility of improvement or failing this, the maintenance of opportunities offered by their current environment (diversity of the resource spaces and possibilities of economic development, access to water resources and to basic infrastructure, reconstitution of the living standards, degree of isolation, etc.). In the case of physical displacement and the need to move onto the land of another host community, the sharing of resources with this new community was seen as a potential source of additional social tension.

Likewise, in view of the progressive remediation of the land exploited by the Project, a certain degree of skepticism has been observed in the communities as to the time needed to restore the productivity of this land so that it would offer the same diversity of economic opportunities as it did before the mining took place.

Questions on job opportunities with Project subcontractors

Stakeholders expressed a certain degree of mistrust with regards to employment opportunities with Project subcontractors (in particular with regards to salary and working conditions).

Cultural heritage

The preservation of the cultural heritage (sacred sites) also came out as a key concern. Some settlements for example stated that they would prefer a physical displacement of the settlement and of its inhabitants to the displacement of cemeteries or sacred sites.

Finally, many stressed the importance of the company respecting and fulfilling the commitments it will make to the impacted communities.

It seems important to note that the consultation of the communities on their concerns in relation to the Project is a delicate exercise which the local populations are not always familiar with. However, the perspectives of the people in the area were heavily influenced by their experiences from the mining activities of CBG, which has been active in the same Prefecture for several

decades, and the first activities of the Project in the area (prospecting activities, demarcation of the plateaus).

Two settlements (S. Madina 2 and Lopé Kanbourama) stated that their heritage sites had been disturbed earlier in 2014 and 2015 during the land works of the subcontractors, who had not taken the trouble to inform the communities of their activities.

Summary

Figure 14.7 summarizes the main expectations of the stakeholders consulted on the Project:

- in dark green: expectations almost systematically mentioned and whose significance was heavily emphasized by the communities;
- in green: expectations often mentioned and whose significance was emphasized by the communities; and
- in light green: expectations mentioned and whose significance was emphasized by the communities.

Figure 14.7 Main expectations of the stakeholders consulted

Socioeconomic	Land tenure and access to resource areas	Power and Governance	Cultural Heritage	Health and Safety	Flow and transport	Education & Community Infrastructure
Recruitment of people impacted - skilled and unskilled permanent jobs foreign	Compensation: furnished fertile land	Permanent communication and consultation between GAC and communities	Preservation of cemeteries and burial sites	Construction of health centers in the villages	Management of existing tracks (opening up of villages) & bridge construction	Construction and renovation of primary and secondary schools
Support to train young people unemployed by the Project	Consultation with communities to rehabilitate resources areas	Respect of the Mining Code and laws of Guinea	Negotiation for the movement of geniuses live sites and observance of the chosen provisions	Construction and maintenance of improved drinking water sources	Development of alternative tracks before the start of activities	Educational support (material, teachers)
Support for income-generating activities (especially for women)	Preservation of source heads and streams	Non-intermediated negotiations between the Project and the communities				
Fair compensations, in consultation with the population						
Modernization of agriculture (water projects, mechanization, inputs)	Sedentarization of farmers		Respect for the confidentiality of information	Establishment of a fire brigade service	Installation of crossings over the rails	Construction of youth centers (multipurpose centers)
Opening up of villages (road, telephone network, bridges)	Preservation and development of land (for agriculture and livestock)	Respect for traditional authorities (negoctiation, communication, conflict management)	Construction of mosques, Korans and prayer rug donations	Improvement of railway safety (fences around the rail) and road safety		
Planning imigration		Transparency of donations and taxes paid for local development	Communication on the activities to anticipate impacts on cultural heritage			
Transparent recruitment policy	Temporary loans (rather than final disposal) of land offered by host villages to dispaced villages	Treatment LGAL to what had been done in the north of the concession		Strengthening surveillance to fight against crime (theft, larceny)	Opening up of the agricultural area north of the rail	Setting up of electricity
		Presentation of the impact study's results to communities		Compensation for noise associated with the increase in traffic		Renovation of houses cracked by vibration
		Strengthening the role of community- relay				

The main expectations and concerns of the stakeholders consulted are mainly related to economic issues: youth employment and compensation for the restoration of livelihoods. Support for income-generating activities, particularly for women (such as the provision of palm oil transformation plants, rice huskers, peanut mills, support to the development of market gardens, etc.) and support to professional training were also important recurring themes from the consultation meetings.

Issues of governance and communication are also a major concern and requests were made for the company to have an open, transparent and continuous dialogue with the impacted populations throughout the Project.

Health and safety are key concerns. Many groups asked GAC to take all possible measures to protect the health and safety of the communities (not just the workers).

It was also requested that the cultural heritage sites should be protected as far as possible. As appropriate, they should be handled with discretion (confidentiality), respect and in close collaboration with the traditional leaders of the communities.

All this information has been used to characterize the social sensitivities during the process of identifying and assessing the impacts.

14.4 METHODOLOGY

14.4.1 Overall methodology

The methodology used for this assessment is described in *Chapter 5*. The evaluation of impacts is following the scales and terminology detailed in *Chapter 5* which definitions are not repeated at the start of each impact assessed.

14.4.2 Specific methodology used for assessment of impacts on cultural heritage

The first step in determining impact significance is to identify the sensitivity of a resource. The locations of all recorded resources are then compared to planned project components. The impact magnitude is assessed based upon the type of impact (i.e. either direct physical impact from ground disturbing activities or indirect impacts to the setting of resources located in close proximity to planned project components) and the magnitude of the impact (Table 14.2).

Table 14.2 Impact magnitude classifications

Impact magnitude characteristics	
Impact Magnitude	**Characteristics**
Negligible Magnitude	- No discernible change in the physical conditions, setting or accessibility of the site.
Small Magnitude	- Small part of the site is lost or damaged, resulting in a loss of cultural or spiritual value. - Setting undergoes temporary or permanent change that has limited effect on the site's perceived value to stakeholders. - Stakeholder/public access to site is temporarily impeded.
Medium Magnitude	- A significant portion of the site is lost or damaged, resulting in a loss of cultural or spiritual value. - Setting undergoes permanent change that permanently diminishes the site's perceived value to stakeholders. - Site becomes inaccessible for the life of the Project to traditional users or other stakeholders with an interest in cultural heritage.
Large Magnitude	- The entire site is damaged or lost, resulting in a nearly complete or complete loss of cultural or spiritual value. - Setting is sufficiently impacted to cause site to lose nearly all or all cultural value or functionality. - Site becomes permanently inaccessible to traditional users or other stakeholders with an interest in cultural heritage.

Impact significance is determined by sensitivity and magnitude. Mitigation measures are then proposed to reduce the magnitude of impact. Residual impact significance is determined by sensitivity and the reduced magnitude.

For the purposes of this assessment, cultural heritage is divided into three categories: 1) *Djinn* locations (sacred forests); 2) cemeteries; and 3) archaeological anomalies. Impact significance can only be assessed for *Djinn* locations and cemeteries at this time, as the sensitivity of potential archaeological sites cannot be determined until they are evaluated (i.e., ground-

truthed) via field investigation in the framework of the RAP process or of the Chance Find Process before continuing land clearing works.

14.5 OVERARCHING SOCIAL MITIGATION MEASURES

Several overarching social mitigation measures will be used to mitigate potential social impacts from the Project. These measures are likely to be used to mitigate concomitantly different impacts arising from the Project. These measures are:

- Resettlement and livelihood restoration;
- Stakeholder Engagement;
- Grievance Procedure;
- Social Investment;
- Good business conduct;
- Influx management; and
- Progressive rehabilitation of mined plateaus.

These measures are applicable to most of the social impacts arising from the Project. These overarching measures are described in details in the Social and Environmental Management Plan for the Project, in *Chapter 18* of the ESIA Addendum within the following plans:

- Livelihood Restoration and Resettlement Framework; and
- Stakeholder Engagement Plan;
- Grievance Management Plan;
- Local Development Plan, including preferential hiring and sourcing;
- Influx Management Plan;
- Code of Business Conduct; and
- Closure and Rehabilitation Plan.

The Project footprint at the mine and port are detailed in *Section 14.6* as it is considered as a major source of direct impact in terms of physical and economic displacement. Therefore the notions of economic and physical displacement and impacts associated with population resettlement are further described in this section together with its mitigation for livelihood restoration. Other indirect impacts from the Project footprint at the Port are then separately discussed in *Section 15.2.*

Others overarching measures are referred to, where relevant, in impact assessment sections of this chapter without further description to avoid repetition and having to develop their content every time they are referred to as mitigation measures.

14.6 RESETTLEMENT AND LIVELIHOOD RESTORATION

Resettlement is proposed as a core mitigation to address major Project impacts related to:

- Project footprint (see *Section 14.6.1*) at the Mine and Port areas; and
- Project emissions: air, noise and vibration at the Mine area only[1].

These impacts will be mitigated by removing sensitive receptors through resettlement. Receptors in the MA likely to be resettled are shown in *Figure 14.8.* which is based on a consolidation of the following overlapping areas:

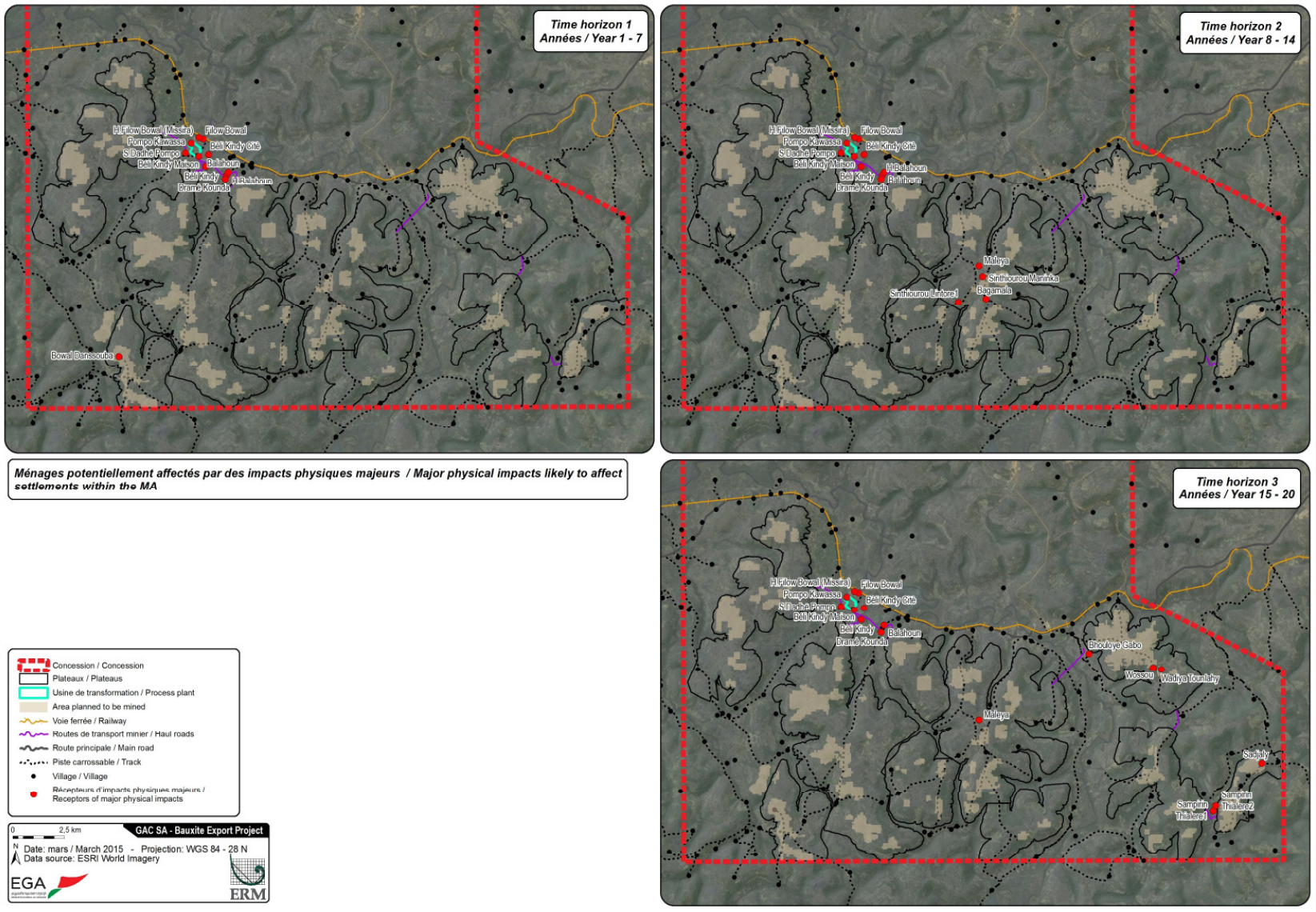
- the Project footprint; and
- long term major air (after implementation of mitigation measures), noise and vibration impacts modeled in the environmental impact assessment for the Mine (*Chapter 8* of ESIA Addendum).

The need for resettlement at the Port area due to the Project footprint is still uncertain, pending results of engineering feasibility studies, and is detailed further in *Section 14.6.1.*

Resettlement will be carried out through the implementation of a Livelihood Restoration and Resettlement Framework (LRRF) and Resettlement Action Plans (RAP) in accordance with IFC Performance Standard 5 on Involuntary Resettlement and AfDB Operational Safeguard 2. Impacts from the Project footprint are further described below in *Section 14.6.1.* Impacts from resettlement and the development of a LRRF and RAP and expected residual impacts are further described in *Section 14.6.2*.

[1] Detailed results on potential major impacts from Project emissions (air, noise and vibration) are available in the physical impact assessment part of the ESIA Addendum for the GAC Bauxite Export Project. Although at the PA, noise levels generated by the transit of trains may be significant for residents located along the railway, resettlement is not be considered as a viable solution considering:(i) the very large number of households living along the railway; (ii) that the Project is not expected to change significantly the existing acoustic environment made of the existing railway traffic, companies operating in the area and the general background noise from urban activities. Therefore no massive resettlement as a mitigation measure to Project induced noise and vibration is expected, however particular cases will be analyzed based on the definitive rail spur and access road design and on results from the grievance monitoring.

Figure 14.8 Major physical impacts likely to affect settlements within the MA



14.6.1 Project footprint and displacement impacts

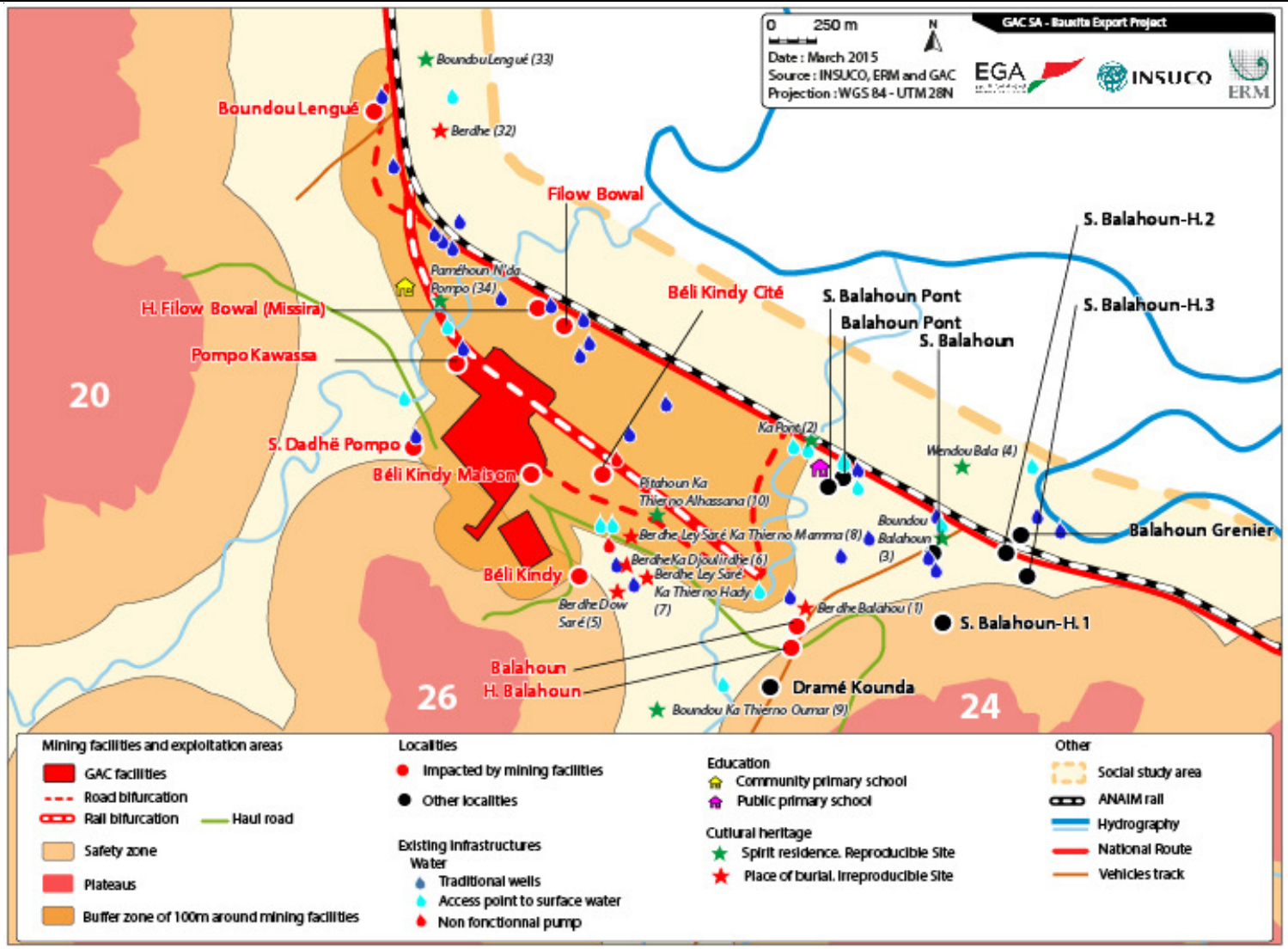
14.6.1.1 Project footprint at mining area

Various facilities and infrastructure will have to be developed as part of the construction phase in the MA, including:

- extension of the railway line with a rail spur from the ANAIM line to the GAC loading station;
- processing facility;
- bauxite stockpiling;
- bauxite loading area;
- fuel depot;
- electricity generator;
- water storage and processing area;
- housing;
- administrative buildings;
- car park for the vehicles and trucks and mechanical workshop; and
- haul roads and bridges.

Figure 14.9 represents the spatial coverage of the proposed processing facility in the MA.

Figure 14.9 Physical footprint of the proposed processing facility in the MA



In the Mine Area, the relative significance of each vegetation type is broken down as follows:

- wooded savannah and wooded copses (*donghol*): 5.1%;
- farmland (*djolol* and *hounsiré*): 36.7%; and
- *bowal*: 50%.

The total population of the eight settlements affected by the future processing facility and mining activities of the Project is 1,445 people. This is mainly a rural population for which cattle herding and agricultural activities are the main means of subsistence.

The community school of Boundou Lengué and the public primary school of Balahoun Pont are also located within the Project footprint, inside the 100 m safety distance around the future facilities for the first, and just outside for the latter.

In addition, 19 traditional wells used by the local population and 9 cultural heritage sites (e.g. sacred and burial sites) are located within the Mine infrastructure area.

Table 14.3 Households, wells and cultural heritage sites potentially impacted by the new process facility, infrastructure and processing activity.

Location	*Number of household*	Number of inhabitants	*Traditional wells*	Sacred Forests	*Burial site*
Boundou Lengué	*146*	947	*7*	2	*1*
Beli Kindy Cité	*26*	173	*3*		
Beli Kindy	*24*	143	*2*		
Filow Bowal	*20*	127	*4*		
S. Dadhë Pompo	*4*	20	*1*	2	*4*
Pompo Kawassa	*4*	16	*1*		
Beli Kindy Maison	*3*	11	*0*		
H. Filow Bowal Missira	*2*	8	*1*		

During operation, mining of the bauxite plateaus will result in additional development of haul roads and land reclamation for mine pit exploitation. The Project footprint from the exploitation of bauxite plateaus are represented in Figure 14.8

14.6.1.2 *Port area*

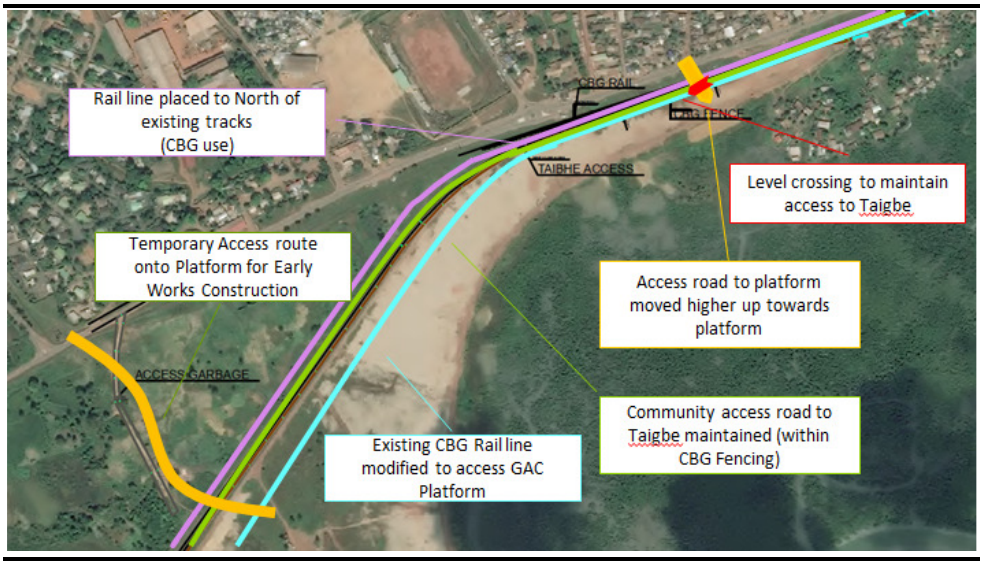
The development of the PA for the Project will require construction of new port facilities within GAC's existing port footprint. The following infrastructure and facilities will be built at the start of the Project:

- development of a rail spur from the ANAIM rail line;
- rail terminal;
- bauxite unloading and warehousing area;
- conveyor;
- docking jetty for the vessels;
- fuel depot and power station;
- water stockpile and processing area;
- merchandise stockpile area;
- worker lodging buildings;
- administrative buildings;
- car park for the vehicles and trucks; and
- mechanical workshops, etc.

The construction of these facilities is currently planned on areas that were already set aside in 2005. However uncertainties remain regarding the location of the rail spur and access road to the port platform. No physical displacement is expected if the use of the free area located between the existing rails and road for the installation of the rail spur and the access road is confirmed by ongoing studies[1]. *Figure 14.10* presents the installation of GAC's rail spur and access road in the abovementioned free area.

[1] Detailed results on potential major impacts from Project emissions (air, noise and vibration) are available in the physical impact assessment part of the ESIA Addendum for the GAC Bauxite Export Project. Although at the PA, noise levels generated by the transit of trains may be significant for residents located along the railway, resettlement is not be considered as a viable solution considering:(i) the very large number of households living along the railway; (ii) that the Project is not expected to change significantly the existing acoustic environment made of the existing railway traffic, companies operating in the area and the general background noise from urban activities. Therefore no resettlement as a mitigation measure to Project induced noise and vibration is expected, however particular cases will be analyzed based on the definitive rail spur and access road design and on results from the grievance monitoring.

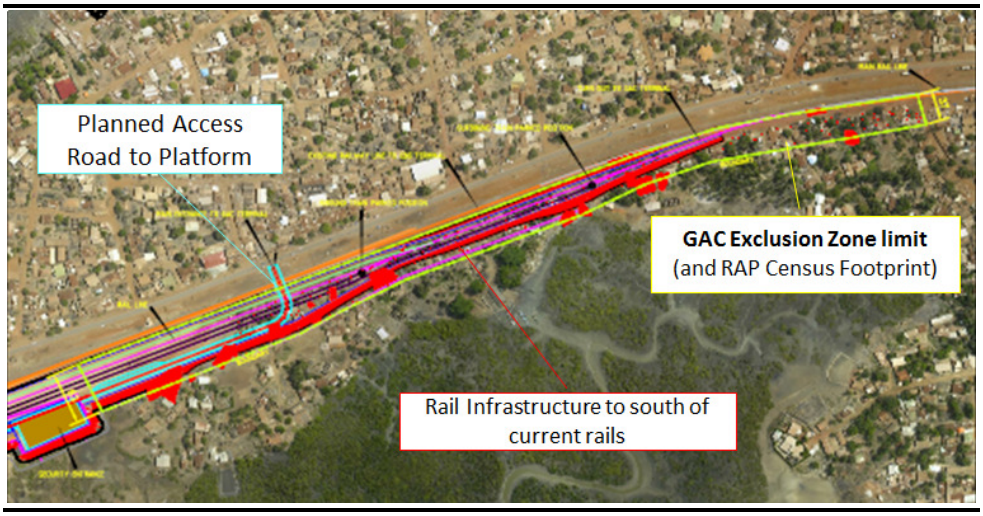
Figure 14.10 Best case footprint avoiding all physical displacement



Depending on the outcome of these ongoing studies, the Project rail spur and/or access road may have to be installed further south of the existing rail lines. Several options in terms of Project footprint exist. Figure 14.11 presents the worst case scenario footprint if the rail spur needs to be installed south of the existing lines.

Rail crossing for local residents will be ensured if necessary by the installation of a level crossing and pedestrian bridge. The exact location of these crossings is still to be determined and depending on their design, resettlement of a few households may be necessary.

Figure 14.11 Project footprint if rail spur needs to be installed south of the existing rails



14.6.1.3 Displacement impacts

Mine area

The construction of mining facilities and infrastructure and the land reclamation of plateaus and haul roads associated with Project's operations will result a change of land use currently dedicated to housing, farmland, pasture, etc.). This change will result in both a "*physical displacement*" (moving homes or loss of shelter) and the "*economic displacement*" (loss of assets or loss of sources of income or means of existence) following an acquisition of land and/or restriction of use of land related to the Project.

Figure 14.12 below shows the spatial coverage of the proposed processing facility and exploitable bauxite plateaus in the MA and their potential displacement impact on households.

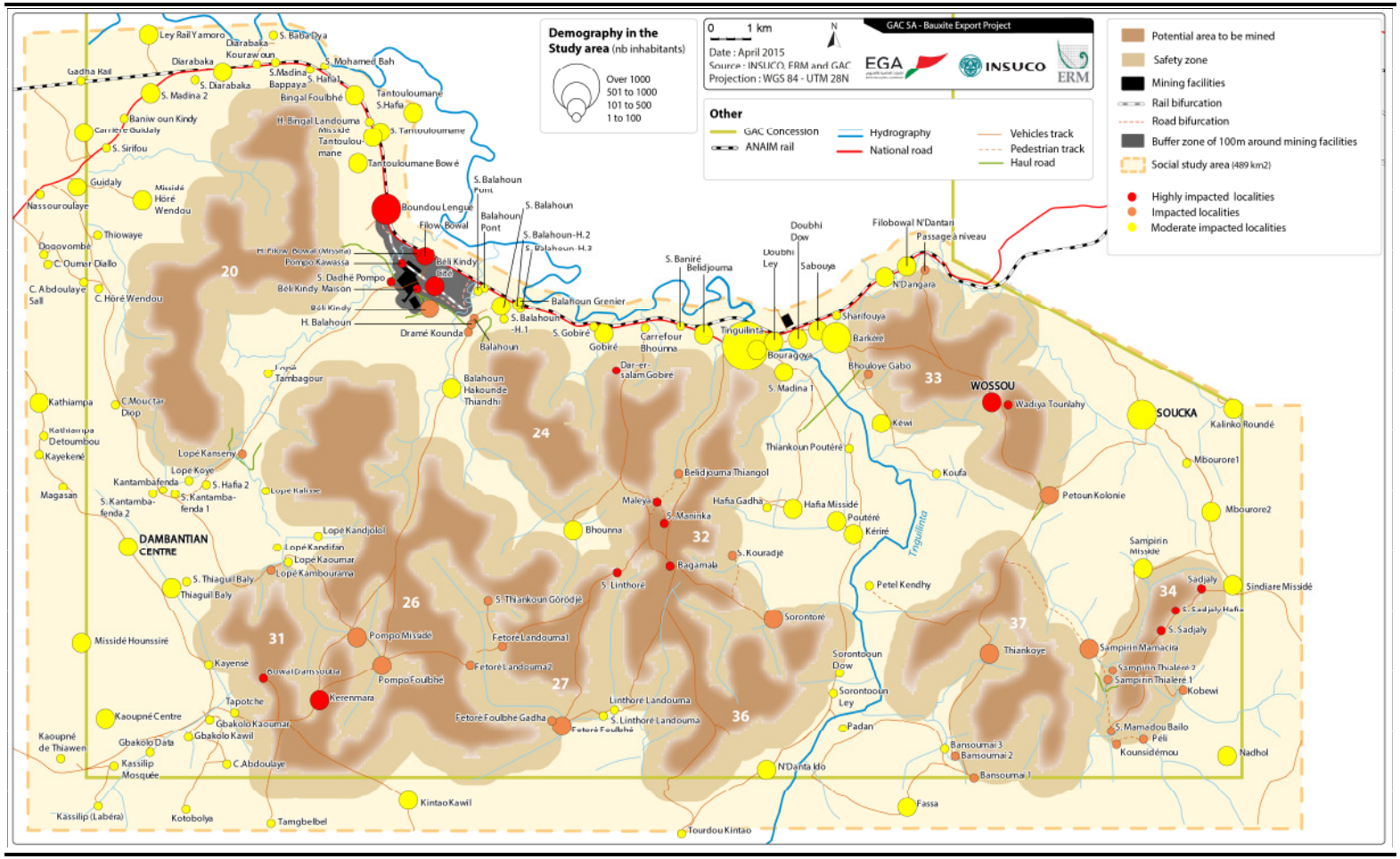
The villages shown in red on the map (19) have been classified as potentially being affected by a major impact. These are settlements and hamlets located on the exploitable areas of the bauxite plateaus, and those based on the area of the future processing facility and other mining infrastructure. As a result, all these households will need to be resettled by the Project.

The villages shown in orange on the map (29) have been classified as potentially subject to an impact of major significance. These are settlements and hamlets whose residential area is located in a 500 m safety distance around the exploitable areas of the bauxite plateaus. These are where the probability of economic displacement of certain households remains high, but where the physical displacements should be limited. For these households, compensation through livelihood restoration may mitigate impacts from economic displacement. Should physical displacement for some of these households be confirmed, they will be resettled by the Project.

The villages shown in yellow on the map (107) have been classified as being subject to an impact of moderate significance. These are settlements and hamlets whose residential area is located more than 500 m from the exploitable plateaus and where the probability of physical and economic displacements of households is low.

It is important to point out that the Project will plan the successive mining of the bauxite plateaus and the reclamation of these after they are mined. Therefore potential physical or economic displacement linked to the exploitation of plateaus will occur progressively in accordance with the Mining Plan.

Figure 14.12 Displacement (physical or economic) impacts from the mine infrastructure and bauxite plateaus exploitable by the project



Port area

Depending on the outcome of ongoing studies with regard to the location of the rail spur and access road to the Project port area, the Project footprint may:

- have no impact on local households; or
- lead to the displacement of different numbers of households.

Table 14.3 presents the options with regards to the different locations of the rail spur and access road and the number of households likely to be impacted by the Project footprint.

Option B and C would result in the change of land use (housing, small agricultural field, business, etc.). This change would result in both "*physical displacement*" (moving homes or loss of shelter) and "*economic displacement*" (loss of assets or loss of sources of income or means of existence) following an acquisition of land and/or restriction of use of land related to the Project.

In the worst case scenario, option C, the displacement effects would be as follows:

- 215 households physically displaced; and
- 82 households economically displaced :
    - 7 would lose small agricultural fields
    - 36 would lose their businesses; and
    - 32 would lose residential buildings.

No community infrastructure and services are expected to be impacted under scenario C with the exception of a prayer room.

In addition, depending on the location and design of the level crossing and pedestrian bridge along the railway, resettlement of a few households may be necessary.

Options B and C and potentially the rail crossing may trigger the need for resettlement. Such resettlement would be carried out in accordance with IFC PS 5 on Involuntary Resettlement and AfDB OS 2.

Table 14.4 Potential footprint options and number of households potentially impacted

Options	*Description*	Number of households
Option A	Rail to North of current tracks and Access route further up towards platform	0
Option B	Rail spur to North of current lines, Access road cannot be moved further towards platform	Approx. 20
Option C	Rail spur located South of current lines	297
Option D	Rail spur located South of current lines & Impact Assessment indicates further mitigation measures	> 297

14.6.2 Resettlement impacts and mitigation

Risks associated with resettlement are mainly:

- homelessness caused by loss of shelter and reduced access to shelter;
- impoverishment from loss of workplaces, productive land or asset and/or other income sources;
- reduced food security from loss of access to or increased pressure on forest products;
- social impacts from loss of cultural identity and changes to family structure, social networks and traditional governance; and
- social tensions and increased rates of crime, disease and mortality in impacted and host areas.

To mitigate these impacts in accordance with IFC PS5, AfDB OS2 and the Project commitments, a strategy for land reclamation and resettlement will be developed to:

- avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs (minimize by order of preference displacement of shelters, businesses, high yielding agriculture land, low yielding agriculture land, pasture land);
- avoid forced eviction;
- anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected;
- improve, or restore, the livelihoods and standards of living of displaced persons; and

- improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at new resettlement sites.

Therefore the Project will develop a Livelihood Restoration and Resettlement Framework (LRRF). The LRRF will comprise but not limited to:

- assessment of the impacts caused by displacement including the different types of assets that will be affected, the different types of ownership of these assets and the benefits they bring to their owners or users;
- policies and rules to follow to determine eligibility for compensation (who is eligible and for what assets) and entitlements to compensation (such as in-kind or cash compensation, training, capacity building, community development or social investment initiatives, transition allowances, or rights to salvage assets prior to land reclamation);
- programs to restore or improve affected people's livelihood;
- grievance mechanism to capture and resolve grievances from people affected by land acquisition; and
- monitoring and evaluation plans to ensure the effectiveness of the resettlements, compensation and livelihoods restoration.

The LRRF will be developed with due consideration of the mitigation measures proposed in this social impact assessment, including but not limited to:

- move displaced people towards host areas offering equal or better economic opportunities and public services to those acquired by the Project ;
- help securing land rights of the displaced persons in their new place of resettlement;
- develop collective compensation which will benefit all households (both host and displaced) for community infrastructure (schools, health facilities, wells, mosques, etc.) ;
- take into account dependency relationships between families and community lineages of the physically displaced households when choosing host sites ;
- develop preferential hiring procedures for the displaced people as described in the Local Development Plan ;
- develop economic restoration programs and projects promoting income generating activities benefiting the displaced persons ;
- involve local government and traditional authorities in the decision and implementation processes of the Resettlement Action Plan ;
- include collective compensation measures and mechanisms for livestock breeders and herders directly impacted by the Project footprint (such as technical training, facilities and support for animal husbandry, etc.);
- secure mining facilities with fencing or soil mounds to reduce interactions between Project equipment and vehicles with livestock herds;
- incorporate into the farming land compensation mechanism the affected persons who hold formal rights (rights of administration) over the land, but also the persons who hold informal rights of use and who might be affected just as much;

- include individual and collective compensation measures and mechanisms for agriculture land (including fallow land) directly impacted by the Project footprint, through replacement of impacted land with land that has a high agricultural potential and by implementing agricultural projects (e.g. technical training, provision of infrastructure, supply of materials and inputs and finance or subsidies); and
- provide financial compensation or compensation in kind throughout the transition period necessary for the displaced households to recover their income generating activities (e.g. agricultural production).

The LRRF will serve as a basis for the development of stand-alone Resettlement Action Plans (RAPs) for individual Project components. These RAPs will be more detailed and practical and will be developed over the Project lifetime.

These will include:

- detailed presentations of baseline conditions of affected households;
- detailed assessment of land access impacts for both those displaced and host communities;
- designs of replacement assets: such as site plans for resettlement sites, and infrastructure design; and
- implementation timelines respecting a maximum of two years after a possible construction moratorium.

The RAPs will include a monitoring program to assess resettlement success, alignment with LRRF and RAP commitments, livelihood restoration, and levels of broad community support.

Project commitments and further details on the development of the LRRF and RAPs are described in the Social and Environmental Management Plan for the Project, in *Chapter 18* of the ESIA Addendum.

Residual impacts from physical and economic displacement after the implementation of a LRRF and RAP are not expected to be significant.

Other social impacts potentially induced by the Project footprint at the PA and associated mitigation are further discussed in *Section 15.2*.

15 MINE AREA

15.1 REVIEW OF BASELINE SENSITIVITIES

15.1.1 Sources of data

The quantitative information and the statistical data in this chapter are, unless stated otherwise, all taken from the socioeconomic baseline presented in *Chapter 12.*

According to the consultation results, most themes have a high sensitivity for the population, although some sub-themes may have a lower sensitivity. Indeed, changes in one theme could generate wider changes in the local communities. More importantly, it is not possible to objectively prioritize themes. *Table 15.1* gives a summary of the review of baseline sensitivities in the MA which are then further described in the sections below.

Table 15.1 Overview table of baseline sensitivities in the mine area.

Theme	Sensitivity	Description
Demography and social dynamics	High	The rural nature and the natural demographic dynamics in the mining area (MA) are likely to be heavily impacted by the Project's arrival. The sensitivity of the affected receptors (i.e. persons and communities in which these people live) is high.
Power, governance and civil society	High	Power, governance and civil society have a high social sensitivity in the MA. The tension between traditional or religious authority and legal authority compromises their legitimacy among local populations. Both fear that the project will contribute towards further weakening of their power and legitimacy.
Land tenure	High	Land tenure is a problem that has an high social sensitivity in the area. Access to land constitutes a major factor in social relationships within families, lineages and between settlements of the MA. This is also a central stake for the local economy.
Development of resource areas dedicated to agriculture	High	The sensitivity of the receptors is high in the area, insofar as agriculture is the primary livelihood activity practiced in the area and it influences social relationships within the settlements.
Development of resource areas dedicated to cattle herding	high	The social sensitivity of cattle herding is high in the MA, insofar as the activity is the primary source of income to dedicated herders and conflicts over land use arise between farmers and herders.
Consumption of natural resources	High	Access to natural resources is a problem with a high social sensitivity in the area, since many households rely on water supplies from surface water and depend on hunting and fishing activities and forest resources for household consumption or additional income.

Theme	Sensitivity	Description
Consumption of surface water	High	The sensitivity of surface water as a resource for the local communities in the MA is high, as more than 80% households in the area take their water from traditional wells or the surface water.
Hunting and fishing	High	The sensitivity of the receptor in the area is considered high, as almost a quarter of households hunt for food and additional income. Fishing is practiced to supply household protein.
Other types of consumption (Forest Products)	High	The sensitivity of the receptors in relation to the potential impact on the use of forest resources is high in the MA. Forest resources include firewood, timber for building and additional Non-Timber Forest Products such as medicinal plants.
Local economic context (mining industry, commerce and services)	high	The social sensitivity of the local economic context theme in the MA is high, insofar as the mining sector at present only represents a low proportion of the professional activities performed by the working population of the MA (0.5%) and expectations generated by the start of the Project in the MA are high, in terms of employment, growth of local economy and development of the area.
Health and safety	high	The sensitivity of the local populations with regards to problems related to health and safety is high in the area. Main fears are associated with the consequence of the inflow of migrants and the risks of accidents related to the Project's activities.
Education	Medium	The social sensitivity of the theme is evaluated as medium. Most of the consulted communities in the MA mainly mentioned the risks of increased pressure on the schools and the risks associated with the movement of pupils in the area, given the opening of the Project's building sites.
Mobility, flows and transport	High	The social sensitivity of mobility is high in the area, particularly in the IA where many communities are counting on the Project to improve the access of their settlements.
Cultural heritage	High	The sensitivity on cultural heritage was evaluated as high during a baseline study in the MA. Cultural heritage may be impacted and includes historic living heritage sites, sites associated with the Muslim religion and "sacred" sites (sites for traditional animist practices).
Living conditions and landscape	Medium	The sensitivity in terms of living conditions and the landscape is medium in the MA. The populations have reported that the dust during the dry season and the noise related to the mining activities could significantly cause a deterioration of their living conditions, quality of their lifestyle and the landscape.

15.1.2 Demography and social dynamics

The MA hosts 155 settlements, hamlets and camps. The average population density of the MA is 36.4 inhabitants/km². It is significantly lower than the national average (43.2 inhabitants/km²) but more than Boké Prefecture (31.4 inhabitants/km² according to the provisional data of the RGPH (General Population and Housing Census) 2014 (http://www.stat-guinee.org).

The population is mainly rural comprised of towns and villages separated by vast unpopulated areas. The settlements along the national road or road area

(RA) are the most populated. They host most of the job-seekers and workers of the informal services and commerce sector of the area.

There is a mixed population in the RA, coming from several regions of Guinea, whereas in the settlements located inside the study area or inland area (IA), most of the population is native to the area.

The annual population growth rate in the MA is estimated at 4% between 1996 and 2014. It is not however homogeneous: that of the villages located on the edge of the road is much more (approximately 7% per annum) than the others (approximately 3%, i.e. more or less the population growth rate in Guinea). It might have reached more than 20% per annum in Tinguilinta in the last 10 years[1].

This finding illustrates the net increase in migration in the settlements of the RA since the inception of the GAC Project, whereas the rate of the IA corresponds to natural growth but is still however very high. More than half the households of the RA settled there, whereas 84% of the households of the IA have "always" been there (native households). Out of the newcomers, almost a quarter of heads of household cite as the main reason for their settlement the job opportunities in the mining sector.

It is clearly found here that the settlements around the mine have already been affected by the migration inflows stimulated by the Project's activities since its inception, particularly by the exploration works.

The sensitivity of the populations to the "demographics and social dynamics" theme is considered high: the rural nature and the natural demographic dynamics of the MA are likely to be heavily impacted by the Project's arrival.

15.1.3 Power, governance and civil society

The power of the founding settlements and of the founding families of these settlements remains very strong. It results in social hierarchy dynamics between developed various ethnic groups such as the Fula and others. The power of the district leaders (the smallest echelon of the decentralized power) is also important, given their proximity and presence with the local populations.

The legal system is not easily separated from traditional/customary law in the day-to-day management of the territory, tensions and conflicts.
At Sub-Prefecture level (decentralized power) and commune level (decentralized power), the lack of technical and financial and capacity building resources of the technical services does not allow these entities to assume all the responsibilities and activities incumbent upon them.

([1]) Rate calculated from the data of the RGPH (General Population and Housing Census) 1996 and from the data obtained during the counting within the framework of the SEIA in 2014 - these figures are given as an indication insofar as the local data of the RGPH 2014 have not been published and hence the reliability of the results of the 1996 census may be questioned.

Based on the consultations results, the sensitivity of this theme is evaluated as high in the MA. Actions of the representatives of the different authorities depend a lot on the relations they have with the other entities. The tension between traditional / religious authority and legal authority compromises the perception of their legitimacy among local populations. The local authorities might see their legitimacy decline if the outcomes of the Project does not meet the very high expectations of the communities. Furthermore, the traditional authorities fear that a modernization of the ways of living and values will contribute towards weakening their power.

15.1.4 Land tenure

In the MA, and more widely in the rural areas of Guinea, the individuals or lineages do not "*own*" the land in the modern meaning of the word. The same land may generate different livelihoods (agricultural, pastoral, etc.) with each having specific rules of access and use.

The notion of "*property and right of use of the land*" is essentially collective, not only within the same settlement but also between settlements. Insofar as the main economic activities are extensive cattle herding and slash-and-burn agriculture, the populations need to be able to access large surface areas of land, but whose exact location matters little.

The so-called "*founding*" settlements are those, which were the first to settle in the area. Thereafter, they have taken in populations to which they have conferred rights of access and use on their land, along with a right to set up a new settlement. There is, hence, an unequal distribution of the land and of dependency relationships between lineages and/or villages. It should also be noted that there are sometimes ambiguities in the status and the boundaries of plots of land.

Given the growing population pressure in the settlements of the RA, a land trading phenomenon (monetized transactions) has recently appeared. The essentially collective land rights are transitioning towards acquisition by private owners of land titles (the land individualization phenomenon).

In the IA, we see different signs of land pressure, particularly:

- the reticence recently expressed by certain settlements in taking in seasonal (nomadic cattle herders) onto their land;
- the increasing development of perennial crops (particularly cashews);
- the significant reduction in the average fallow time for land over recent years; or even
- the appearance of rental practices of vegetable plots or pasture land.

The sensitivity of the affected receptors (i.e. persons and communities in which these people live) in relation to the potential impacts exercised on the use of the land is high in the MA. Access to land constitutes a major influence on the social relationships within families, lineages and between settlements of the MA. This is also a key resource for the local economy (*see Section 15.1.5*).

15.1.5 Development of community resource areas

15.1.5.1 Development of resource areas dedicated to agriculture

Agricultural activities are practiced by almost all the population of the MA. Slash-and-burn agriculture of annual crops (rice, cassava, corn, cashews) is the most common activity. The duration of the rotation cycles (fallow) varies between 5 and 7 years. The land area needed to satisfy the food needs of a household is even more important. Rice is the main staple crop.

We also note a strong development of perennial crops in the area and of cashews in particular. Apart from the revenue likely to be generated by this activity, the development of plantations is also an indicator of the land individualization process (see *Section 12.5* on Land Tenure in the *Chapter 12, social baseline study*).

In the IA, agriculture represents more than three-quarters of household income. A distinction should however be made between the farming income, which has developed within the framework of household-consumption (food crops) and exclusively money (cash) income. Thus, vegetable crops, cashews and perennial crops (palm trees, cashew nut trees and fruit trees) represent over 80% of the money (cash) income for the agricultural sector in the area.

The sensitivity of the receptors is high in the MA, insofar as this is the primary activity practiced in the area and as it structures social relationships within and between settlements.

15.1.5.2 Development of resource areas dedicated to cattle herding

Cattle herding requires extensive pasture land. This is a particularly important activity among the Fula population and is practiced by approximately 20% of the households of the MA (41.2% of the Sub-Prefecture of Sangarédi is populated mainly by Fula communities).

Seasonally, nomadic cattle herders pass through the Landouma communities of the Tanéné Sub-Prefecture. Thus 6 camps of Fula cattle herders have been recorded on the land of the Landouma communities of the MA (see *Section 12.3.2, Cattle breeding*).

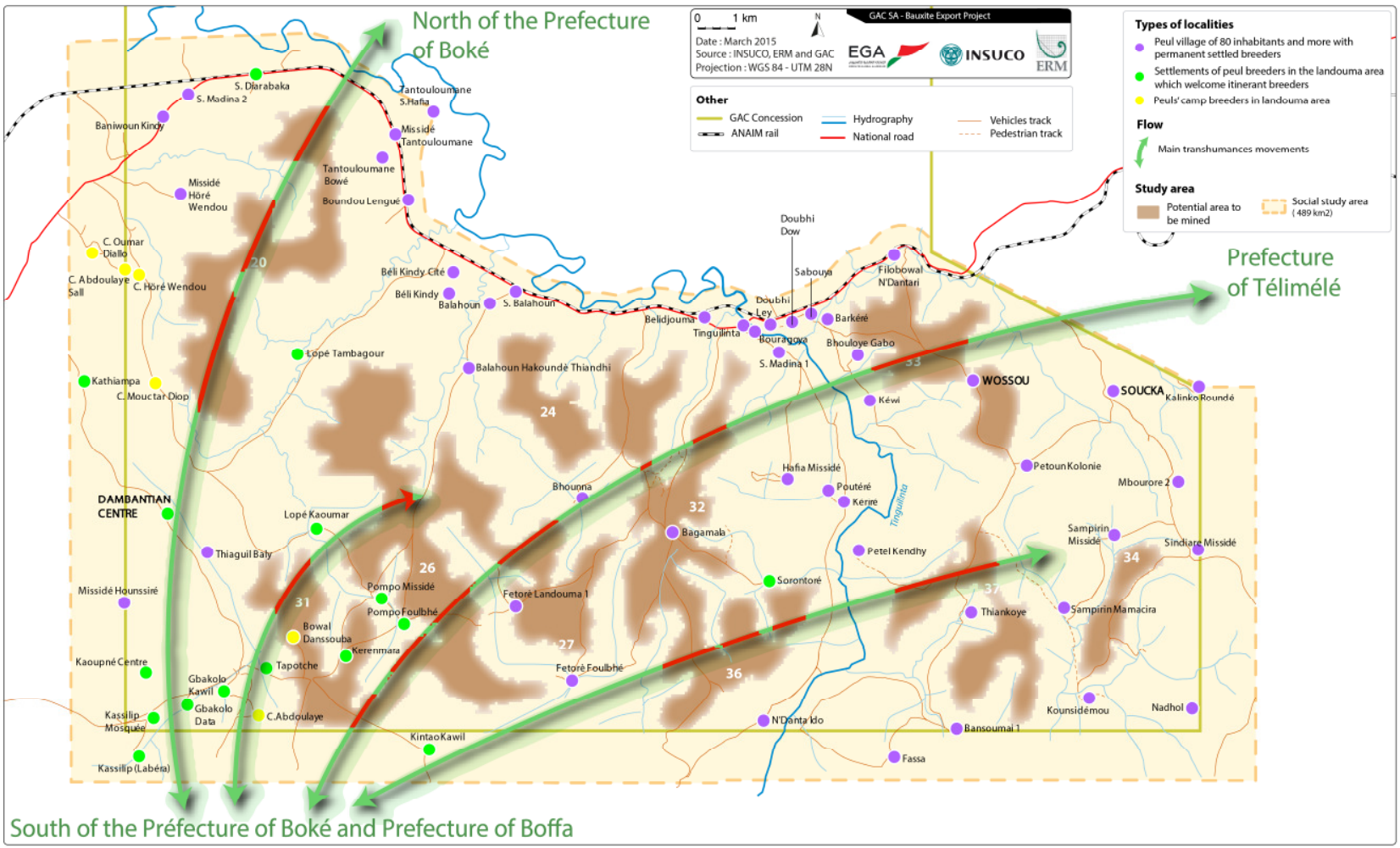
The cattle herders of the area have developed nomadic routes both along the perimeter of the concession (short migrations) and outside (long migrations to the coastal area in the dry season). Cattle herders coming from neighboring territories (Télimélé Prefecture in the east, coastal area of Boké Prefecture and Boffa Prefecture in the south) pass by and also stop in the MA during their large migrations. The movement of herds is therefore regular throughout the year in the Project's area and takes place on all the land territories of the settlements (*see Figure 15.1*).

The river Tinguilinta does not constitute an obstacle to the nomadic migrations; there are several crossing points of the river even inside the study area (in Sintiourou Baba Dya, Petel Kindy, Padan, etc.).

Some settlements located in the direct proximity of the railway track have stated that they gave up cattle herding following the construction of the ANAIM railway and the numerous accidents involving cattle (case of Gadha Rail or even of Bingal Foulbhé). Others have recently decided to limit the seasonal hosting of nomadic cattle herders to avoid the damage to the perennial crops (cashews). In this respect, frequent conflicts between farmers and breeders occur.

The sensitivity of the receptor is high in the MA, insofar as this cattle herding is the primary source of income to dedicated herders and conflicts over land use arise between farmers and herders.

Figure 15.1 Map showing herders migration routes patterns across the MA



15.1.5.3 Consumption of natural resources

Access to natural resources is a problem with a high social sensitivity the area, since many households rely on water supply from surface water and depend on hunting and fishing and other forest resources for consumption or additional income.

Consumption of surface water

Most households in the area take their water from traditional wells or the surface water. The phenomenon is particularly marked in the IA where more than 80% of the households get their drinking water from surface water (rivers or springs). Numerous water bodies dry up during the dry season, sometimes forcing the populations to dig wells even inside the riverbed or to move towards more remote water bodies.

Bathing and household tasks (clothes / dish washing) are done in surface water (rivers, etc.).

The sensitivity of surface water as a resource for the local communities is therefore high.

Hunting and fishing

Almost a quarter of households occasionally hunt in the MA for domestic consumption and for selling.

Fishing is practiced by men during the rainy season and by men and women in the dry season. This is subsistence fishing, mainly intended to supplement the protein intake of households.

The sensitivity of hunting and fishing resources for the local communities can therefore be considered high.

Other types of consumption

The collection and cutting of firewood is widely practiced by 90% of households and is used first of all for household consumption. The manufacturing of coal for commercial purposes is a recent development in some settlements of the RA.

Numerous tubers and wild berries are harvested in the MA. This is most often an additional contribution to household food, but may also replace rice during the months of April, May and June, at the start of the planting period. Wild honey and the fruits of certain oil plants are also harvested. For example, the seeds of *néré* are transformed into *soumbara*, a frequent food condiment in Guinea.

Forests are also important for collecting timber, various building materials (roof straw, gravel, etc.) and firewood (used daily as a heating fuel). These are also places for collecting medicinal plants used by the local traditional healers.

The sensitivity of forestry resources for the local communities can therefore be considered high.

15.1.5.4 Typology of the resource spaces in the MA

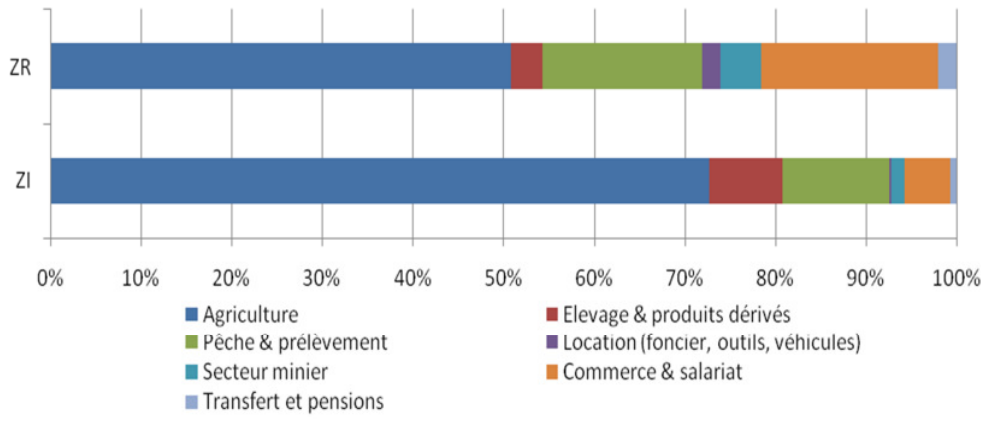
We note here that several bauxite plateaus encroach on the land developed by the local populations: *bowal*, *donghol*, *hounsiré*, and the top of the *djolol*. The relative significance of each vegetation type on the bauxite plateaus of the study area is broken down as follows (see *Chapter 6, Environmental Baseline for the Mine*):

- wooded savannah: 34%;
- forest and gallery forest: 3%;
- patchwork of slopes (farming areas): 42%; and
- *bowal*: 21%

15.1.5.5 Significance of the development of resource spaces in the economic strategy of households

Figure 15.2 shows the distribution of household income in the mine area.

Figure 15.2 Distribution of household income in the MA according to the activities sectors



Agriculture: agriculture / *Elevage & produits dérivés:* breeding & derived products / *Pêche & prélèvement:* fishing & sampling / *Location (foncier, outils, véhicules):* rental (property, tools, vehicles) / *Secteur minier:* mining sector / *Commerce & salariat:* commerce & workforce / *Transfert et pensions:* transfer and pensions

Figure 15.2 shows the relative significance of the income from the development of the land (farming, cattle herding and consumption of natural resources) in the total income earned by the households of the MA: comprising almost three-quarters of the total income for the households of the RA and more than 90% of the total income for the households of the IA. This confirms the high sensitivity of the local populations in relation to access to natural resources, in all places of

the IA, who depend on these resources to meet their primary needs (food and water).

15.1.6 Local economic context (mining industry, commerce and services)

The main providers of salaried jobs in the private sector in the Boké Prefecture are the mining companies and their subcontractors such as the CBG Project and the GAC SA Project. The mining sector at present only represents a low proportion of the professional activities performed by the working population of the MA (0.5%). Households with one member working with a mining company are mostly located in the RA (1% versus 0.1% in the IA).

Arts and crafts and small business are carried out, particularly in the RA, as an additional livelihood activity designed to provide a source of supplementary income for the household.

It should be noted that actions of GAC in support of community development have, up to present, been implemented in the North part of the concession (outside the MA) and in the RA (settlements of the district of Boulléré and Sangarédi), in accordance with the first Mining Plan for the exploitation of the northern part of the concession before Project was stopped and redefined. The stakeholders consulted all recognize the magnitude of the efforts made by the Project to support community development in the "*north area*". As a result, expectations from the local population of the "*south area*" are high with regard to support from GAC to community development.

The social sensitivity of the local economic context theme is high, insofar as the expectations generated by the start of the Project in the MA are extremely high, in terms of boosting the local economy and participating in the overall development of the area.

The fears are also high concerning the measures, which would be taken within the framework of a future Resettlement Action Plan (RAP). Numerous stakeholders mentioned their perception of the RAP carried out in the north area of the concession which would not have always led to the complete restoration of livelihoods of resettled households. They insisted that GAC applies strict principles with regard to restoration in the south area to ensure that impacted communities are not impoverished following their resettlements.

15.1.7 Health and safety

The supply and quality of public healthcare services is poor in the MA (insufficient and poorly trained personnel, no equipment, no electricity, difficult access to water, etc.). The public facilities are the primary place for consulting for more than two thirds of the population.

The sensitivity of the local populations with respect to problems related to health and safety is high. The main fears are associated with the consequences of the inflow of migrants in the area putting additional pressure on local

amenities (e.g. health centers) and the risks of accidents related to the Project's activities.

15.1.8 Education

The education rate of those aged 7 to 15 in the MA is estimated at 47%, which is lower than the national average (51%). Although many people have gone to school, few of them have a diploma and only 24.6% of men and 16.3% of women state they are literate in French. For cultural reasons, girls have lower access to education than boys.

There is no secondary or higher education in the MA. The closest university and professional education is located in the town of Boké.

Most of the consulted communities did not mention particular concerns related to access to education but mainly mentioned the risks of increased pressure on schools and the risks associated with the movement of pupils in the area, given the start of the Project's construction.

The social sensitivity of the theme is evaluated as medium.

15.1.9 Mobility, flows and transport

Accessibility to the settlements in the MA by vehicle varies significantly. In the RA, four settlements located just before the railway are separated from the road. In the IA, 18 settlements are inaccessible by vehicle throughout the year and 19 others become so during the rainy season.

Ninety-one percent of households in the MA state that they regularly go to the Tinguilinta market. The settlements of the SP of Sangarédi also regularly go to the Sangarédi market, whereas the settlements of the SP of Tanéné go to the Boké market.

A large number of pupils use the national road to attend the schools of Guidaly, Baniwoun Kindy, Misside Tantouloumane, Boundou Lengué, Balahoun Pont, Tinguilinta and Doubhi in the mornings and evenings.

On the plateaus, we note the flows of pupils who attend the schools of Pompo Misside, Hafia Misside and Wossou, and those of pupils from many settlements located on plateau 32 who go to Tinguilinta.

The team noted the importance of the Tinguilinta healthcare facilities infrastructure located on or alongside plateaus 24, 26, 27, 31 and 32 and that of the Soucka healthcare station for the inhabitants of the settlements located on or alongside plateaus 33, 34 and 37.

The social sensitivity of the theme of mobility is high in the area, particularly in the IA where many communities are counting on the Project to improve vehicle access to their settlements.

15.1.10 Cultural heritage

The social baseline study found that the Muslim religion is predominant in the area. Thus 16 mosques and 11 *almadjadja* were recorded. Animist practices are still very present and are manifested by the existence of "sacred" sites.

In addition to these Muslim and sacred sites, the field survey recorded 230 other living heritage sites[1] on the plateaus and within the 300m safety zone around the plateaus. Of these, 156 are *Djinn* (sacred forest) locations, 73 are modern cemeteries, six of which are classified as cemeteries for koranic scholars. The vast majority of modern cemeteries are located adjacent to modern villages. Of the *Djinn* locations, 27 are high sensitivity, 37 are medium sensitivity, and 92 are low sensitivity resources. Of the 73 modern cemeteries, 71 are high sensitivity and two are medium sensitivity resources. All sensitivity evaluations were made in the field during the baseline survey.

Within the 230 sites, 21% of the recorded *Djinn* locations are situated in the river valleys. In general, the *Djinn* locations are more likely to be found on the plateaus rather than down in the river valleys. As a consequence, they also tend to be located in areas distant from recently built habitation. 89 sites are considered nowadays not be reproduced par by responsible persons and/or the communities, meaning that their resettlement is not considered.

The settlement of Wossou has a unique heritage character in the MA due to its history, its social dominance over other settlements and two of its heritage sites, which are the Mosque and Erudite Cemetery.

The sensitivity of cultural heritage may be considered high in the entire MA. It was specifically dealt with in the mission in charge of this theme within the framework of the socioeconomic baseline study. Cultural Heritage is a very delicate issue that must be handled carefully particularly since there is a culture of secrecy, with respect to traditional animist practices.

In all the settlements, the communities expect the Project to pay particular attention to cultural heritage, under the supervision of the traditional authorities.

The social issues and their techniques associated to sites are detailed in Appendice 3 of this report.

15.1.11 Living conditions and landscape

The living conditions and the landscapes of the study area are typical of an area that is still essentially rural, particularly in the IA. There are a series of plateaus (the *bowés*) covered with herbaceous vegetation in the rainy season, divided by wooded copses and gallery forests in the dip areas. The settlements are

(1) Living cultural heritage sites refers to sites that are presently used by the local population in opposition to archeological sites that are remains from the past history.

generally quite spaced out from each other, in order to ensure sufficient availability of natural resources. Numerous rivers and streams run through the area; some come from sources, which do not dry out, whereas others do in the dry season. During the rainy season, the *bowés* are covered by seasonal watercourses, which the inhabitants of the settlements use for bathing, washing clothes and cleaning kitchen utensils.

In the settlements, the housing is surrounded by fruit trees, which provide shade and are used as meeting places.

The sensitivity in terms of living conditions and the landscape is medium in the MA. The populations have reported that the dust during the dry season and the noise related to the mining activities could significantly cause deterioration in their living conditions, the quality of their lifestyle and the landscape. The quality of living conditions in potential resettlement areas (presence of trees for shade, etc.) was also mentioned on several occasions.

15.2 IMPACTS RELATED TO THE PROJECT'S PHYSICAL FOOTPRINT

15.2.1 Introduction

This part specifically deals with the social impacts induced by the Project's physical footprint. Direct Project physical and economical displacement impacts and the need for resettlement and livelihood restoration are presented in *Section 14.6.* Impacts related to the Project's direct contribution to the development of the local economy during the different activities' phases and the changes in the socioeconomic dynamic it induces - creation of jobs, migration flows, increase in budgets dedicated to local development - are developed in *Section 15.3.*

Overarching social mitigation measures used to mitigate or enhance potential social impacts from the Project are mentioned in *Section 14.5* above and further detailed in the Social and Environmental Management Plan for the Project, presented in *Chapter 18.* These measures are:

- Resettlement and livelihood restoration;
- Stakeholder Engagement;
- Grievance Procedure;
- Local Development Plan;
- Code of business conduct;
- Influx management; and
- Closure and rehabilitation.

These measures are applicable to most social impacts arising from the Project and therefore will not be further developed for each of the impacts assessed below with the exception of those who can be specifically tailored to a certain impact. Wherever these measures are considered relevant to mitigate these impacts they will be mentioned in the overview table of each Project residual impact.

15.2.2 Construction phase

15.2.2.1 Sources of impact

Various facilities and infrastructure will have to be developed as part of the construction phase, including:

- extension of the railway line with a rail spur from the ANAIM line to the GAC loading station;
- processing facility;
- bauxite stockpiling;
- bauxite loading area;
- fuel depot;
- electricity generator;
- water stockpile and processing area;
- housing;
- administrative buildings; and
- car park for the vehicles and trucks and mechanical workshop; . and
- haul roads and bridges.

The construction of these facilities will result in the change of allocation of some land currently dedicated to other uses (housing, farmland, pastures, etc.).

The Project area will also be marked by the movement of heavy mobile equipment, which will be used for constructing the new infrastructure. Heavy vehicle traffic may be particularly dense at some times of the construction phase on the national road connecting Kamsar to the MA.

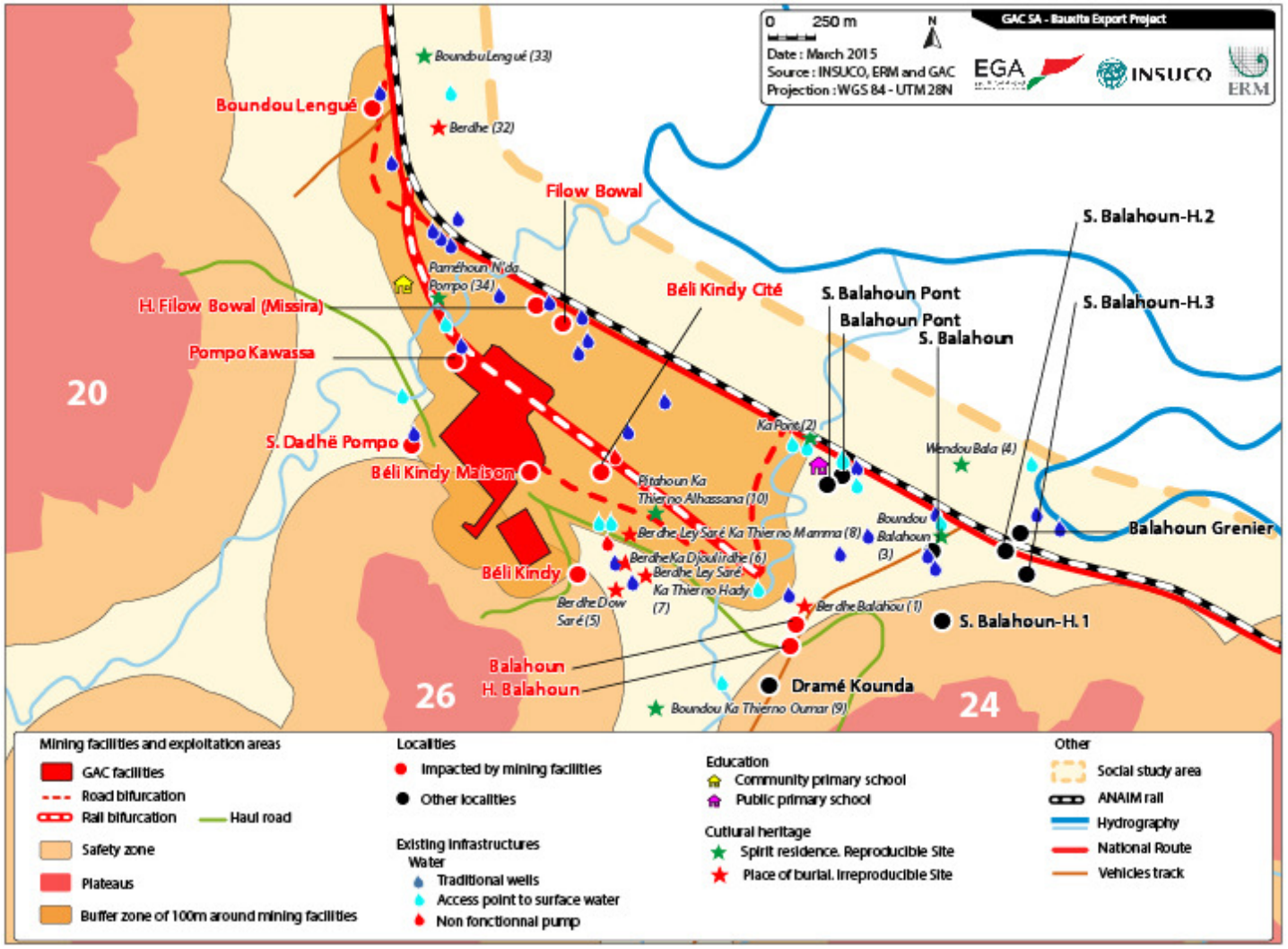
Some hazardous materials will have to be stored and used for building purposes (fuel, cleaning products, drinking water treatment agents, etc.; however the Project's activities will not use industrial processes using industrial amounts of chemical products, or generate effluents or hazardous materials)[1].

Coverage of the Project's future plants

The *Figure 15.3* below represents the spatial coverage of the proposed processing facility in the MA.

[1] Effluents will be limited to the wastewater effluent from domestic origin (workers camp). Hazardous waste from incineration (ashes) and solvents will be stored on site for disposal out of Guinea.

Figure 15.3 Physical footprint of the proposed processing facility in the MA



According to the data collected in the environmental baseline *Chapters 6*, the proportion of each vegetation type in the future plants is broken down as follows:

- wooded savannah and wooded copses (*donghol*): 5.1%;
- farmland (*djolol* and *hounsiré*): 36.7%; and
- *bowal*: 50%.

Table 15.2 Settlements potentially impacted by the new process facility, mining activities and infrastructure

Location	*Number of households*	Number of inhabitants	*Traditional wells*	Sacred forests	*Burial site*
Boundou Lengué	*146*	947	*7*	2	*1*
Beli Kindy Cité	*26*	173	*3*		
Beli Kindy	*24*	143	*2*		
Filow Bowal	*20*	127	*4*		
S. Dadhë Pompo	*4*	20	*1*	2	*4*
Pompo Kawassa	*4*	16	*1*		
Beli Kindy Maison	*3*	11	*0*		
H. Filow Bowal Missira	*2*	8	*1*		

The total population of the eight settlements concerned by the future processing facility and mining activities of the Project is 1,445 people. This is mainly a rural population for, which the cattle herding and agricultural activities are the main means of subsistence.

Access to water

This population gets its consumption water supply from 19 traditional wells and surface water. Nineteen of these water sources are located within the safety zone (13 traditional wells and 6 points of access to surface water. The only *"improved"* water body[1] of the area (located in Beli Kindy Cité) has not been functional for more than ten years. All the settlements, apart from Filow Bowal and H. Filow Bowal Missira further state having access to surface water and making use of it for the consumption water supply as extremely important for their livelihoods.

Figure 15.3 shows that the two rivers on either side of the future plants that are particularly heavily used.

Cultural heritage

Four sacred sites (reproducible sites) have been identified in the 8 settlements, two of which are located in the area identified for the construction of the GAC plants. Five burial sites have been recorded, one of which is located on the

[1]According to the WHO/UNICEF Joint Monitoring Programme for Water Supply, 'Improved' sources of drinking-water are those that adequately protect the source from outside contamination

Project's coverage area. One sacred site, located to the north-east end of the coverage area, belongs to the community of Balahoun (*Figure 15.3*).

Access to education

The school pupils of Filow Bowal, Filow Bowal Missira, Pompo Kawassa, S. Dadhë Pompo and Beli Kindy Maison attend the community school of Boundou Lengue, located inside the 100 m safety distance around the future plants. Those of Beli Kindy and Beli Kindy Maison attend the public primary school of Balahoun Pont (located just outside the safety distance).

Summary of the spaces concerned by the construction of the processing facility

The construction works will therefore have major impacts on:

- residential areas;
- community infrastructure (water, education);
- croplands and pastures;
- settlement surface water supply sites; and
- cultural heritage sites.

The footprint of the future infrastructure (which includes the footprint of the actual Pioneer Camp and facilities to be developed, the space between the infrastructure and the national road and a 100 m safety distance to the south and east of these infrastructure) covers almost 30% of the registered land of Beli Kindy (on which all the aforementioned settlements and hamlets are based, apart from Boundou Lengué).

The footprint of the future infrastructure and facilities also covers the start of the track, which connects Lopé Tambagour to the national road. It can therefore be anticipated that the construction of the Project infrastructure might have consequences on the movement of the inhabitants of Lopé Tambagour and of the settlements located further to the South (Lopé Kanseny, Lopé Kalisse, Lopé Koye, Kantambafenda, etc.).

15.2.2.2 *Impacts on demographics and social dynamics*

Change in the traditional family structure

The physical and economic displacements of the populations of settlements affected by the Project footprint may cause a change in the family structure of the persons affected. Persons previously supporting families might have to become dependent following the loss of land, which initially provided their means of subsistence. The pressure on already vulnerable people (elderly, widows, orphans, disabled) would be even greater. There might be an increasing dependence on their wives for men who lose their subsistence activities, some of whose economic activities (small business, transformation of farming products) are much less linked to the land and natural resources.

During the construction phase, this impact will be mainly visible in the road area, in the process facility and other mining infrastructure. In this area, it could have a medium magnitude and receptors have high sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to reduce the significance of this impact are the implementation of the following overarching measures mentioned in *Section 14.5* above:

- resettlement and livelihood restoration
- Local Development Plan; and
- preferential hiring and sourcing from the people directly affected by the resettlement in the company and its contractors.

Resettlement will take into account families and communities' structures and existing relations with host communities. The implementation of these mitigation measures, by providing alternative land and sources of income while taking into account family ties, is expected to result in a moderate residual impact.

Loss of cultural markers and identity

The potential physical displacements and resettlements of settlements by the construction of the processing facility could result in a loss of cultural and identity markers in the populations concerned. Persons who previously had strong land rights (founding families) and drew from them an important social status could find themselves in a situation of dependence on a family, a lineage or a host community.

The physical replacements of the founding settlement Boundou Lengué (see *Figure 12.1* in *Section 12.1.1, Summary of the population history in the mine area*) will potentially affect:

- the identity of the populations of these settlements who fear a "*loss of their dignity*" going from the status of "*founders*" to that of "*strangers*" in case of resettlement on new land;
- the relations of power in the area; and
- the social balances.

The magnitude of this impact will be low in the area, since it will affect only a small portion of the mining area, but of very high sensitivity in the settlements concerned (see *Figure 14.8*); the significance of the impact will therefore be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by helping securing land rights to the displaced people and by taking into account dependency relationships between families and community lineages in the selection of displacement areas.

The implementation of these mitigation measures will result in a residual impact of minor significance insofar as their rights and cultural identity would be taken into account.

Increase in social tensions

Following the possible resettlement of the persons affected by the construction of the processing facility, the MA would include resettled settlements, host settlements and settlements not affected by the resettlement plans, due to their location in an area of lower impact or the absence of assets to host the displaced populations (major land resources). Unequal treatment of these three types of communities by the Project upon the implementation of the mitigation measures could lead to an upsurge in tensions between communities.

In the host settlements, tensions might also arise between the host populations and the hosted populations around social and identity issues, with the possible reversal of dependency relationships, which might exist between the host communities and the displaced communities. To this end, it should be recalled that Boundou Lengué and Beli Kindy are decision-making communities as regards their respective land, whereas Filow Bowal, Filow Bowal Missira, Pompo Kawassa and Sintiourou Dadhë Pompo are hamlets dependent on Beli Kindy.

The magnitude of the impact will be low during the construction phase but the receptors have a high sensitivity, therefore the significance of the impact will be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by developing collective compensation programs in benefits of hosts and displaced households, engaging regularly with local communities and by taking into account dependency relationships between families and community lineages in the selection of displacement areas.

The implementation of this mitigation measure will result in a minor residual impact significance.

Table 15.3 Mine area - impacts of the project's physical footprint on demographics and social dynamics during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Change in the traditional family structure	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2. - To develop and implement a Local Development Plan with the aim to support income-generating activities for the displaced persons. - To implement a preferential hiring and sourcing procedure in favor of people directly affected by the resettlement (subject to availability and skills of the applicants for each job to be filled).	*Moderate*
Loss of cultural markers and identity	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2 in particular by securing land rights to the displaced people and by taking into account dependency relationships between families and community lineages in the selection of displacement areas.	*Minor*
Increase in social tensions	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2 in particular by developing collective compensation programs in benefits of hosts and displaced households, engaging regularly with local communities and by taking into account dependency relationships between families and community lineages in the selection of displacement areas.	*Minor*

15.2.2.3 Impacts on local power, governance and civil society

Weakening of methods of traditional governance

The authority of the traditional power relies mostly on its control of the management of the collective land areas. This authority could be weakened by the loss of control by the representatives of the traditional power of the land requisitioned by the construction of the processing facility, and the land identified for the resettlement of the displaced persons. Tensions might arise between the Project and the representatives of the authority of the communities potentially displaced if these latter are not involved in the resettlement process. Further, the land lending systems between lineages and settlements might be affected, with the development of new strategies aiming to secure the land not farmed in favor of the "*founding*" settlements and lineages.

This impact will have a low magnitude and receptors have high sensitivity in the processing facility area (in the RA) and in the settlements, which will be resettled (IA), the significance of the impact will therefore be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by involving local authorities in the decision and organization process of the displacements (e.g. selection of areas, organization of displacements, restoration programs, etc.)

The implementation of this mitigation measure is expected to result in a minor residual impact. Indeed, if the local and traditional authorities are considered decisive stakeholders in the Project, traditional governance will be less challenged by the populations affected by the Project.

Table 15.4 Mine area - impacts of the project's physical footprint on powers, governance and civil society during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Weakening of methods of traditional governance	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2 in particular by involving local authorities in the decision and organization process of the displacements (e.g. selection of areas, organization of displacements, restoration programs, etc.).	*Minor*

15.2.2.4 Impacts on land

Increase in social tensions on the land resource

The displacement of stakeholders by the Project will result (through implementing the RAP) in compensation for the loss of land rights (collective and individual) of the affected stakeholders. Likewise, compensation may be considered for those owners of land where displaced stakeholders will be resettled. This implies that the limits and the land tenure status of the displaced persons and of the host populations are clearly defined, in an initial context of superimposition of the administration rights and use rights for the same space. Further, it may be that there is some ambiguity as to the exact limits of certain land in the complete absence of a register in the area.

The land transactions and the compensation paid further to the acquisition of the land by the Project and the resettlement of the displaced persons might exacerbate the underlying social tensions on the land resource.

The magnitude of this impact will be low during the construction phase but would have high sensitivity therefore the significance of the impact will be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by:

- involving traditional authorities in charge of land management and considering their inputs with regard to the land tenure rights and land boundaries;
- favoring collective compensation measures to minimize individual land take in benefit of resettled households thereby avoiding conflict related to land boundaries and to reinforce a feeling of collective gain; and
- engaging regularly with the local population to incorporate their knowledge and views into the resettlement process.

In addition the implementation of a grievance mechanism will support the Project in resolving issues and conflicts on land resources that may result from the displacement process.

The implementation of these mitigation measures are expected to result in a minor residual impact.

Table 15.5 Mine area - impacts of the project's physical footprint on land tenure during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in social tensions on the land resource	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by involving local authorities in charge of land management, favoring collective compensation measures and by engaging regularly with the local population. - To continue using a grievance mechanism that is widely known by the local authorities and runs effectively and transparently.	*Minor*

15.2.2.5 Impacts on agriculture and cattle herding

Decrease in the cattle herding practice

The spatial coverage of the Project's future plant will encroach on the land used for cattle herding, and may lead to a reduction in the number of heads of cattle owned by the cattle herders or even the complete abandoning of the activity. We should point out to this end that Boundou Lengué and Beli Kindy are settlements where settled cattle herders live. This tendency might be accentuated by the partial loss of access to water and by the obstacles that the process facility and other mining infrastructure may cause on the transhumance flows. The risks of collisions with work site trucks could finally dissuade the cattle herders from keeping their cattle near the Project infrastructure and operational areas.

The amplitude of the impact will be low during the construction phase but would have high sensitivity; therefore the significance of the impact will be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by developing individual and collective compensations for the displaced cattle herders (e.g. securing alternative pasture land and water sources, provisioning of technical training courses and support to animal health, etc.) and by securing the mining areas with mounds and fences in order to limit interactions of Project mobile equipment and vehicles with herds and ruminants.

In addition the implementation of a Local Development Plan Local Development Plan and development programs is expected to further support cattle herding in the MA.

The implementation of these mitigation measures will result in a minor residual impact.

Decrease in agricultural production

The Project's future mining areas will encroach on land initially dedicated to agricultural activity: annual crop fields and fallow fields, market gardens and palm groves near watercourses and plantations of perennial crops. To this end, it should be recalled that more than one third of the land areas concerned by the construction of the processing facility is farmland. Given that the practices in the area consist of pooling the use of the land, these losses of farmland must not therefore be considered only as losses for the families holding the administration rights on this land, but also for all households that would lose or would see their access to the land deteriorate.

Despite the implementation of appropriate hazardous substances management procedures, potential spills of fuel or other chemicals in the aquatic

environment could also have a negative impact on the farming yields in the palm groves and the market gardens. Also, dust could be deposited on the trees and crops and reduce the production yields, and also reduce the presence of herds and therefore the fertility represented by animal fertilization in the fields.

All of these factors could contribute to significantly reducing the farming production in the construction area of the mines.

This impact will have a low magnitude during the construction phase throughout the MA but high sensitivity. The significance of the impact will therefore be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by:

- minimizing the encroachment on the lands with the greatest agricultural potential;
- compensating for the loss of agricultural land particularly by the replacement of this land with high farming potential development land when possible ;
- compensating both holders of strong rights (rights of administration) and simple use rights; and
- the development of agricultural development projects.

In addition the management of hazardous substances and spill risks and the impacts related to traffic and dust on site will be managed through the development and implementation of a Dust management plan, Traffic management plan and a Hazardous materials management and Spill prevention and response plan.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase.

Decrease in food security

The subsistence strategy of the rural households of the MA consists of investment by the whole family in agricultural activity and particularly the production of food crops (rice, tubers, other cereals, etc.). The decrease in agricultural production following the construction activities of the processing facility is expected to have a significant impact on the food security of the impacted households.

This impact will have a low magnitude during the construction phase throughout the MA but high sensitivity. The significance of the impact will therefore be moderate.

The above mentioned measures to mitigate impacts on agriculture, cattle herding and incomes (e.g. resettlement and livelihood restoration, Local Development Plan) will reduce the significance of the residual impact to minor.

In particular, the LRRF foresees the provision of financial compensation or compensation in kind throughout the transition period necessary for the displaced households to recover their agricultural production levels.

Increase in conflicts between farmers and cattle herders

The conflicts between farmers and cattle herders, already multiple in the area, could increase given the reduction in pasture land, accentuating the climate of competition around different land uses. Indeed, deprived of certain pasture areas, the herds could further damage the crop-growing areas and exacerbate the resentment of farmers against the cattle herders.

This impact will have a low magnitude during the construction phase throughout the MA but receptors (herders and farmers) have a high sensitivity. The significance of the impact will therefore be moderate.

To avoid the social tensions and conflicts between the farmers and the cattle herders of the area, the considered compensation measures are:

- to secure the crop-growing areas (installation of fencing);
- to supervise the herds (construction of enclosures); and
- to develop specific areas for growing crops and others for cattle herding through the development of a shared fertility management scheme.

The implementation of these mitigation measures would reduce the significance of the impact by demarcating the crop-growing areas and the pasture areas. The residual impact during the construction phase is expected to be minor.

Table 15.6 Mine area - impacts of the project's physical footprint on agriculture and cattle herding during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in the cattle herding practice	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2in particular by developing individual and collective compensations for the displaced cattle herders (e.g. securing alternative pasture land and water sources, provisioning of technical training courses and support to animal health, etc.) and by securing the mining areas with mounds and fences in order to limit interactions of Project mobile equipment and vehicles with herds and ruminants. - The implementation of a Local Development Plan and development programs to further support cattle herding in the MA.	*Minor*
Decrease in agricultural production	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2in particular by: • minimizing the encroachment on the lands with the greatest agricultural potential; • compensating for the loss of agricultural land particularly by the replacement of this land with high farming potential development land when possible ; • compensating both holders of strong rights (rights of administration) and simple use rights; and • the development of agricultural development projects. - To manage the site with respect to best industry practice in particular the management of hazardous substances and spill risks and the impacts related to traffic and dust on site through the development and implementation of a Dust management plan, Traffic management plan and a Hazardous materials management and spill prevention & response plan.	*Minor*
Increase in food insecurity	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS2in particular by provisioning of financial compensation or compensation in kind throughout the transition period necessary for the displaced households to recover their agricultural production levels.	*Minor*
Increase in conflicts between farmers and cattle herders	*Moderate*	- To secure the crop-growing areas (installation of fencing). - To supervise the herds (construction of enclosures). - To develop specific areas for growing crops and others for cattle herding (thus enabling a shared fertility management scheme to be proposed).	*Minor*

15.2.2.6 Impacts on access conditions to natural resources

Deterioration of the access conditions to water

Water is used in the MA for household consumption, personal hygiene, dish washing, irrigation of garden markets and even the watering of animals.

The Project may generate impacts on access to water within the infrastructure site boundaries. Access to the 19 traditional wells located within the Safety Zone (13 traditional wells and 6 points of access to surface water) and the two watercourses located each side of the infrastructure area (see Figure 15.3 Physical footprint of the proposed processing facility in the MA) may be limited. The commencement of construction could contribute to the deterioration of the surface water quality, particularly due to the dust generated by the scouring of the land and the traffic of site trucks.

This impact will have a low magnitude during the construction phase throughout the MA but high sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are:

- to finalize the plans of the processing facility and related infrastructure so as to minimize their impact on the surface water supply areas of the surrounding populations (100 m buffer zone recommended in Articles 110 and 111 of the Mining Code 2013);
- to develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration IFC PS 5 and AfDB OS2 which will result in the relocation and livelihood restoration of most users of the impacted water sources;
- to develop a Local Development Plan, in particular by building improved water bodies (human powered pumps) near housings affected by reduced access to water in collaboration with the populations to seek appropriate solutions (type, location and number of structures, operating and maintenance conditions, etc.);
- to limit as much as possible the sources of atmospheric pollution by developing a Dust management plan and Traffic management plan including measures to control dust emissions from traffic and earthmoving works (e.g. reduced speed limit, watering of site surfaces, etc.);
- to manage hazardous materials and risks of spills by developing a Hazardous materials management and spill prevention & response plan in line with best industry practice; and
- to treat Project wastewater to limit the risk of untreated discharge into the natural environment.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. It would limit the significance of the

impact by providing a buffer zone to protect the surface water[1], by limiting the sources of pollution and by providing improved access to quality water.

Decrease in economic opportunities and income related to consumption of natural resources

As specified in the baseline report in *Section 12.3.3, Use of natural resources*, the consumption of natural resources varies and represents major resources for the economy and for the local social organization.

Several forest areas dedicated to hunting, fishing, the collection of timber, firewood and building materials, to the picking of food-related products or even medicinal plants could be affected by construction of the Project facilities and infrastructure. In addition to the change of allocation of the land, the noise pollution caused by the construction works and the traffic of the site trucks could chase away wild animals.

The probable reduction in forest cover around the process facility and other mining infrastructure could have consequences for all households living near the future infrastructure, and particularly persons specialized in the exploitation of natural resources (hunters, fishermen, traditional healers, joiners, carpenters, etc.).

This impact will have a low magnitude during the construction phase throughout the MA but high sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to minimize the Project's coverage area on the surface water used for fishing (100 m buffer zone recommended in Articles 110 and 111 of the Mining Code 2013);
- to develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC 55PS5 and AfDB OS2 which will result in the relocation and livelihood restoration of some users of the natural resources; and
- to develop a Local Development Plan, in particular through programs in support of :
    - agricultural development ; and
    - economic diversification and development of alternative income-generating activities (e.g. arts and crafts, commerce, services, transformation of farm produce);
- to support the creation of community forests (protected areas, managed collectively by the communities in order to protect the access to various resources); and

[1] Buffer zones around water bodies, where no Project activities is allowed, are the following : (i) 50 m from any water body; (ii) 300 m either side along headwaters feeding forest galleries ; (iii) 100 m either side along Tinguilinta river; (iv) 250 m around water abstraction/wells.

- to support at community level, the breeding of rodents (grass-cutters) and fishing farming projects in order to compensate for the reduction in game and fishing products.

In addition, as part of the foreseen mitigation in the environmental impact assessment in *Chapter 8*, hunting will be banned for all employees and there will be information and trainings to discourage hunting of wild animals.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase.

Increase in food insecurity

The hunting and fishing products, the harvesting of wild tubers and berries or even the honey crop can significantly improve the diet of households with very low monetary means. During the crop planting period and at the end of the dry season, the wild yams harvested by the rural populations of the MA may thus compensate for the absence of rice in the daily diet of the households.

The probable reduction in areas for collecting these natural resources following the start-up of the construction of the processing facility, mining activities and related infrastructure could therefore have consequences on the food security of households living close to these future plants.

This impact will have a low magnitude during the construction phase throughout the MA, and medium sensitivity. The significance of the impact will therefore be minor.

The implementation of the above measures to mitigate impacts to natural resources will result in a negligible residual impact during the construction phase. These measures will allow for limiting the significance of the impact by giving access to alternative economic resources, limiting the risks of food insecurity.

Table 15.7 Mine area - impacts of the project's physical footprint on access conditions to natural resources during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Deterioration of the access conditions to surface water	*Moderate*	- To finalize the plans of the process facility and other mining activities and infrastructure so as to minimize their impact on the surface water supply areas of the surrounding populations (100 m buffer zone recommended in Articles 110 and 111 of the Mining Code 2013). - To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS5 and AfDB OS2 that will result in the relocation of most users of the impacted water sources. - To build improved water bodies (human powered pumps) near housing in collaboration with the populations to see appropriate solutions (type, location and number of structures, operating and maintenance conditions, etc.). - To limit as much as possible the sources of atmospheric pollution by developing a Dust management plan and Traffic management plan including measures to control dust emissions from traffic and earthmoving works (e.g. reduced speed limit, watering of site surfaces, etc.). - To manage hazardous materials and risks of spills by developing a Hazardous materials management and spill prevention & response plan in line with best industry practice. - To treat Project wastewater to limit the risk of untreated discharge into the natural environment.	*Minor*
Decrease in economic opportunities and income related to consumption of natural resources	*Moderate*	- To minimize the Project's coverage area on the surface water used for fishing (100 m buffer zone recommended in Articles 110 and 111 of the Mining Code 2013). - To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS5 and AfDB OS2which will result in the relocation and livelihood restoration of some users of the natural resources. - To develop a Local Development Plan, in particular through programs in support of : • agricultural development ; and • economic diversification and development of alternative income-generating activities (e.g. arts and crafts, commerce, services, transformation of farm produce). - To support the creation of community forests (protected areas, managed collectively by the communities in order to protect the access to various resources). - To support at community level, the breeding of rodents (agoutis) and fishing farming projects in order to compensate for the reduction in game and fishing products.	*Minor*
Increase in food insecurity	*Minor*	- Implement above mitigation measures to mitigate the decrease in economic opportunities and income related to the consumption of natural resources.	*Negligible*

15.2.2.7 Impacts on the local socioeconomic context

Decrease in income

The high proportion represented by agriculture and cattle herding in the income generated by the households of the MA was emphasized in the *Chapter 12* devoted to the baseline conditions. Without mitigation measures, we may therefore anticipate a significant decrease in household revenue whose land dedicated to cattle herding and agricultural will be impacted by the construction of the Project's mines and infrastructure.

The spatial coverage of these future plants potentially covers eight settlements located on the edge of the national road (RA), where the inhabitants generally practice a more diversified range of activities than in the IA (working in textiles, construction, artisanal food producers, mechanics, small retail businesses, etc.). The potential displacement of the populations of these settlements might therefore cause a decrease in income made from these artisanal, business and service activities.

Further, access to the national road for the settlements located south west of the processing facility and associated infrastructure (Lopé Tambagour, Lopé Kanseny, Lopé Kalisse, Lopé Koye, Kantambafenda, etc.) may be disrupted by construction activities. Local inhabitants use this track to go to the weekly market in Tinguilinta, the main outlet for the sale of local produce. The start-up of the works is therefore likely to result in a reduction in the opportunities for selling local produce and a subsequent decrease in revenue of the settlements concerned.

This impact will have a low magnitude during the construction phase throughout the MA but the receptors have a high sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS5 and AfDB OS2 in particular by:
    - developing economic restoration programs and projects promoting income generating activities
    - the selection of displacement areas that offer similar economic opportunities ; and
    - the provision of financial compensation or benefits in kind throughout the transition period necessary for the displaced households to resume their economic activities.
- to develop a Local Development Plan in particular that promotes alternative income-generating activities (support to the transformation and selling of farm produce); and
- to build alternative tracks (and crossing points over watercourses) in order to avoid the isolation of settlements.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. These measures will allow for limiting the significance of the impact by offering similar economic opportunities to those lost and alternative economic resources.

Inflation of commodity prices and the price of other local produce

We have detailed in the previous sections (*see Section 15.2.2.5*) the impact that the start-up of the construction of the processing facility might have on agriculture, cattle herding and the access conditions to natural resources.

The decrease in agricultural production, the reduction in the practice of cattle herding or even the decrease in opportunities for collecting building materials, timber and firewood in the RA could result in a significant decrease in the supply of these products and result in inflation of their respective prices on the local markets.

This impact will have a low magnitude during the construction phase throughout the MA, and medium sensitivity. The significance of the impact will therefore be minor.

The planned measures to mitigate the significance of this impact are:

- to develop a Local Development Plan, in particular by implementing projects in relation to the objectives of increase agricultural (e.g. technical courses, provision of equipment and inputs, harvest pre-financing) and herding productivity (e.g. development of forage crops, development of water points, animal healthcare program, etc.); and
- to support at community level, the breeding of rodents (grass-cutters) and fishing farming projects in order to compensate for the reduction in game and fishing products on the market.

The implementation of these mitigation measures will result in a negligible residual impact during the construction phase. Indeed, these measures will decrease the significance of the impact by improving the productivity of part of the agricultural activities and by developing alternative activities.

Table 15.8 Mine area - impacts of the project's physical footprint on local socioeconomic context during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in income	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS5 and AfDB OS2 in particular by: • developing economic restoration programs and projects promoting income generating activities • the selection of displacement areas that offer similar economic opportunities ; and • the provision of financial compensation or benefits in kind throughout the transition period necessary for the displaced households to resume their economic activities. - To develop a Local Development Plan in particular that promotes alternative income-generating activities (support to the transformation and selling of farm produce). - To build alternative tracks (and crossing points over watercourses) in order to avoid the isolation of settlements.	*Minor*
Inflation of commodity prices and the price of other local produce	*Minor*	- To develop a Local Development Plan, in particular by implementing projects in relation to the objectives of increase agricultural (e.g. technical courses, provision of equipment and inputs, harvest pre-financing) and herding productivity (e.g. development of forage crops, development of water points, animal healthcare program, etc.) - To support at community level, the breeding of rodents (grass-cutters) and fishing farming projects in order to compensate for the reduction in game and fishing products on the market.	*Negligible*

15.2.2.8 Impacts on health and safety

This section assesses the potential Project impacts on communities' health & safety. Impacts and mitigation measures from noise & vibration and air-quality are described in *Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum and will not be further described in this section. Physical impacts of major significance will be mitigated through resettlement of the receptors as mentioned in *Section 14.6.*

General increase in safety risks and diseases transmission

The presence of the Project workers and constructions works is likely to increase the safety risks and diseases in the MA compared to pre-project level. Interactions with workers and expatriates could result in conflicts or an increase in transmission of diseases while construction activities could result in accidents or accidental releases of hazardous products for the population.

This impact will have a medium magnitude during the construction phase throughout the MA, and medium sensitivity. The significance of the impact will therefore be minor.

Some mitigation measures are common to all the impacts identified on the health and safety and the workers and the communities. They are explained here and will not be repeated in the mitigation measures identified for each of the following impacts related to health and safety. These measures are:

- to evaluate the risks and the impacts on health and safety to which employees and affected communities are exposed and to take the appropriate prevention measures including by developing a Health, safety and security management plan and a Community health, safety and security plan;
- to use appropriate working methods and techniques to protect the environment, the safety of workers and of the surrounding populations (pursuant to the Environmental Code and with the applicable international best practices);
- to design and construct the structural elements of the Project by taking account of the risks to which the workers and the affected communities are exposed;
- to reduce the potential exposure of the community to hazardous materials and substances including by developing a Hazardous materials management and spill prevention & response plan;
- to select Project security personnel to ensure they are not involved in past human rights abuses;
- to train Project security staff and personnel on local cultural practices and expected behaviors when interacting with local communities;
- to continue using a Grievance Mechanism allowing the population to raise safety issues;
- to inform the populations of the installation of the building sites and their duration so as to be able to report the risks associated with the activities of the Project; and

- to develop a Local Development Plan, in particular with regard to the objectives to improve access to and quality of health care infrastructure and services and raise local communities awareness on hygiene, health and communicable diseases.

The implementation of these mitigation measures will result in a negligible residual impact during the construction phase. Indeed, they should be able to limit the significance of the impact by protecting the health and safety of the population impacted during this phase.

Diseases related to water and sanitation

The start-up of the construction of the infrastructure is likely to result in the appearance of or the increase in diseases related to water and sanitation, both for the Project's workers and for the surrounding populations.

The risk of discharges of industrial effluents (including fuel) and the possible deposits of dust, which may silt up the watercourses and change their water regime near the site area of the infrastructure, could result in a reduction or deterioration of the resource. These negative effects on the quality, the quantity and the availability of drinking water might in particular result in diarrhea, parasitic diseases, typhoid fever and even gastroenteritis diseases.

The most vulnerable populations would be children, the elderly, the disabled, the sick persons and pregnant women.

The start-up of the works will also result in production of different waste (industrial or not) that could deteriorate health conditions.

This impact will have a medium magnitude during the construction phase throughout the MA, and medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to reduce the production of hazardous and non-hazardous waste and manage it appropriately (residue, waste and hazardous materials' management strategy);
- to adopt anti-dust measures (truck traffic, scouring of land, sweeping and backfilling operations); and
- to propose alternative solutions to the surface water supply of surrounding populations.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. Indeed, they should be able to limit the significance of the impact by protecting the health and safety of the population impacted during this phase.

Diseases related to the displacement of populations

The populations of the settlements that are potentially displaced and/or lose access to the spaces, which ensure their traditional means of subsistence, might also find themselves affected in their physical and moral well-being (loss of markers). The likely loss of part of the means of subsistence, even temporary, of certain displaced populations might have consequences on the level of food security and health of these households.

This impact will have a low magnitude during the construction phase throughout the MA, and receptors have high sensitivity. The significance of the impact will therefore be moderate.

The implementation of a RAP in accordance with the principles of a LRRF as mentioned in *Section 14.6.2* above is expected to mitigate the significance of this impact. By achieving livelihood restoration while taking into account family ties and communities' lineage in the resettlement process, the implementation of this measure is expected to result in a minor residual impact during the construction phase.

Lack of road safety

The increased presence of site trucks during the construction phase of the Project might result in an increase in the risk of road traffic accidents.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are:

- to develop a Traffic and transportation management plan including specific measures to increase safety for the local population (e.g. avoidance or residential areas, reduced speed near populated areas, etc.);
- to adopt and install a road traffic code for the entire mine area (speed limits, sign boards, control barriers at the entrance of the settlements, etc.);
- to put a campaign in place to raise the awareness of the population on road safety issues;
- to avoid the movement of the populations on the tracks used by the construction trucks by developing alternative safe paths;
- to prohibit the access of non-authorized persons to the building sites; and
- to pay for the costs induced by road traffic accidents for which the Project's vehicles are proven liable.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. Indeed, they should be able to limit the significance of the impact by protecting the safety of the population impacted during this phase. The payment of the costs incurred by the accidents would allow for reducing the sensitivity of the populations impacted by the Project to this problem.

Employee safety

The start-up of the construction works of the process facility and other mining infrastructure might result in an increase in risks for the safety of workers:

- risks of injuries, accidents and diseases related to the carrying out of physical work;
- risks of accidents in driving trucks;
- risks associated with the presence of noise, vibrations and dust;
- risks of accidents associated with tiredness (lack of attention) for the night-time workers; and
- risks of accidents associated with the handling of hazardous products or in case of one-off events (for example fires or leaks).

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are:

- to establish an operational health and safety management system to prevent occupational health and safety risks to workers;
- to identify the potential dangers for the workers, particularly likely to constitute a threat for their lives;
- to initiate measures designed to prevent the accidents, injuries and diseases resulting from the work by minimizing, as much as possible, the cause of such dangers;
- to safeguard the safety of the machines and equipment;
- to ensure the ability to work of the workers (physical conditions);
- to develop a training program for the Project's workers (direct and indirect jobs) in order to ensure that these employees have the skills, information and capacities required to manage the risks associated with the job to which they are assigned;
- to provide the workers with all the protection equipment necessary to minimize the risks associated with the professional tasks carried out; and
- to check compliance with the application of the aforementioned standards by the subcontractors of the Project, particularly by conducting regular audits and taking corrective measures if need be.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. These prevention measures should in fact allow for limiting the significance of this impact.

Access to healthcare

The probable partial loss of income of certain households at the start of mining construction works might have an impact on the budget allocated by these households to healthcare. Further, access to the national road for the settlement of Lopé Tambagour is likely to be disrupted by the construction of the plants,

whose spatial coverage covers the track that allows this settlement to get to Tinguilinta and its healthcare infrastructure. The start-up of the works is therefore likely to result in a deterioration of the access to healthcare for the inhabitants of Lopé Tambagour. Finally, the persons potentially displaced at the time the building sites open might be resettled in the most isolated areas where access to healthcare is even less obvious.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- the implementation of a RAP in accordance with the principles of a LRRF as mentioned in *Section 14.6.2* above in particular by:
    - restoring displaced people livelihoods and source of incomes;
    - the selection of resettlement sites that offer similar or better access to healthcare services;
    - developing collective compensations which will benefit to all households (hosts and displaced) such as community health facilities;
    - providing for financial compensation or compensation in kind for the displaced households through the transition period.

- the development and implementation of a Local Development Plan with the objective is to improve access and quality of health services and infrastructure, including by:
    - participating, in collaboration with the local administrative authorities, in the construction of new healthcare infrastructure and in the renovation of old ones depending on the needs;
    - providing existing public healthcare services with equipment and consumables.

The implementation of these measures will result in a minor residual impact during the construction phase. These measures will in fact allow for limiting the significance of the impact by limiting the losses of income (which result in a deterioration of access to healthcare). The involvement of the local authorities in the construction projects of the healthcare infrastructure might further reduce the sensitivity of the populations to the impact on access to healthcare.

Table 15.9 Mine area - impacts of the project's physical footprint on health and safety during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Air quality		*Refer to Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum.	
Noise & vibration		*Refer to Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum.	
General increase in safety risks and diseases transmission	*Minor*	- To evaluate the risks and the impacts on health and safety to which employees and affected communities are exposed and to take the appropriate prevention measures including by developing a Health, safety and security management plan and a Community health, safety and security plan. - To use appropriate working methods and techniques to protect the environment, the safety of workers and of the surrounding populations. - To design and construct the structural elements of the Project by taking account of the risks to which the workers and the affected communities are exposed. - To reduce the potential exposure of the community to hazardous materials and substances including by developing a Hazardous materials management and spill prevention & response plan. - To select Project security personnel to ensure they are not involved in past human rights abuses. - To train Project security staff and personnel on local cultural practices and expected behaviors when interacting with local communities. - To use the Grievance Mechanism allowing the population to raise safety issues. - To inform the populations of the installation of the building sites and their duration so as to be able to report the risks associated with the activities of the Project. - To develop a Local Development Plan, in particular with regard to the objectives to improve access to and quality of health care infrastructure and services and raise local communities awareness on hygiene, health and communicable diseases.	*Negligible*
Diseases related to water and sanitation	*Moderate*	- To reduce the production of hazardous and non-hazardous waste and eliminate it appropriately (residue, waste and hazardous materials' management strategy). - To avoid or reduce and control the discharge of effluents in the environment (evaluate their production, transport, handling, stockpile and use). - To adopt anti-dust measures (truck traffic, scouring of land, sweeping and backfilling operations). - To construct improved water bodies in order to propose alternative solutions to the surface water supply of surrounding populations.	*Minor*
Diseases related to the displacement of populations	*Moderate*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS5 and AfDB OS2which will result in the livelihood restoration of displaced households while taking into account family ties and communities' lineage in the resettlement process.	*Minor*
Lack of road safety	*Moderate*	- To develop a Traffic and transportation management plan including specific measures to increase safety for the local population (e.g. avoidance or residential areas, reduced speed near populated areas, etc.).	*Minor*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Employee safety	*Moderate*	- To adopt and install a road traffic code for the entire mine area (speed limits, sign boards, control barriers at the entrance of the settlements, etc.). - To put a campaign in place to raise the awareness of the population on road safety issues. - Avoid the movement of the populations on the tracks used by construction vehicles by developing alternative safe paths. - To prohibit the access of non-authorized persons to the building sites. - To pay for the costs induced by road traffic accidents for which the Project's vehicles are proven liable. - To establish an operational health and safety management system to prevent occupational health and safety risks to workers. - To identify the potential dangers for the workers, particularly likely to constitute a threat for their lives. - To initiate measures designed to prevent accidents, injuries and diseases resulting from the work by minimizing, as much as possible, the cause of such dangers. - To safeguard the safety of the machines and equipment. - To ensure the ability to work of the workers (physical conditions). - To develop a training program for the Project's workers (direct and indirect jobs) in order to ensure that these employees have the skills, information and capacities required to manage the risks associated with the job to which they are assigned. - To provide the workers with all the protection equipment necessary to minimize the risks associated with the tasks carried out as part of the job. - To check compliance with the application of the aforementioned standards by the subcontractors of the Project, particularly by conducting regular audits and taking corrective measures if need be.	*Minor*
Access to healthcare	*Moderate*	- To implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above in particular by: • restoring displaced people livelihoods and source of incomes; • the selection of resettlement sites that offer similar or better access to healthcare services; • developing collective compensations which will benefit to all households (hosts and displaced) such as community health facilities; and • providing for financial compensation or compensation in kind for the displaced households through the transition period. - To develop and implement a Local Development Plan with the objective to improve access and quality of health services and infrastructure, including by: • participating, in collaboration with the local administrative authorities, in the construction of new healthcare infrastructure and in the renovation of old ones depending on the needs; and • providing existing public healthcare services with equipment and consumables.	*Minor*

15.2.2.9 Impact on education

Access to education

The possible partial loss of income of certain households further to the start-up of the construction works might have an impact on the budget dedicated by these households to the education of children. Further, the movement of trucks at the opening of the building sites will be a factor of disruption for the mobility and of risk for the safety of children who attend school in the neighboring settlements. In particular the children who attend the primary schools of Boundou Lengué and Balahoun Pont are at risk. Finally, the persons potentially displaced during construction might be resettled in most isolated areas where education services are less accessible resulting in decreased attendance to school.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are:

- the implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above in particular by:
    - restoring displaced people livelihoods and source of incomes;
    - the selection of resettlement sites that offer similar or better access to education;
    - developing collective compensations which will benefit to all households (hosts and displaced) such as the construction of community schools;
    - providing for financial compensation or compensation in kind for the displaced households through the transition period to ensure continued payment of education charges by households.

- the development and implementation of a Local Development Plan with the objective is to improve access and quality of education, including by:
    - participating, in collaboration with the local administrative authorities, in the construction of new schools and in the renovation of old ones depending on the needs;
    - providing existing public schools with educational materials and consumables;
    - developing a study bursary system for the pupils and students of the poorest households, for those living in particularly isolated areas and to encourage the education of girls.

- to build alternative tracks (and crossing points of watercourses) in order to avoid the isolation of settlements and propose safe paths so that children can attend school.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. These measures will in fact allow for

limiting the significance of the impact by limiting the losses of income (which result in a deterioration of access to education) and the risks of isolation of the settlements. The involvement of the local authorities in the construction projects of the school infrastructure might further reduce the sensitivity of the populations to the impact on access to education.

Table 15.10 Mine area - impacts of the project's physical footprint on education during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Access to education	*Moderate*	- To implement a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above in particular by: • restoring displaced people livelihoods and source of incomes; • the selection of resettlement sites that offer similar or better access to education; • developing collective compensations which will benefit to all households (hosts and displaced) such as the construction of community schools; and • providing for financial compensation or compensation in kind for the displaced households through the transition period to ensure continued payment of education charges by households. - To develop and implement a Local Development Plan with the objective is to improve access and quality of education, including by: • participating, in collaboration with the local administrative authorities, in the construction of new schools and in the renovation of old ones depending on the needs; • providing existing public schools with educational materials and consumables; and • developing a study bursary system for the pupils and students of the poorest households, for those living in particularly isolated areas and to encourage the education of girls. - To build alternative tracks (and crossing points of watercourses) in order to avoid the isolation of settlements and propose safe paths so that children can attend school.	*Minor*

15.2.2.10 Impact on mobility, flows and transport

Isolation of settlements

The construction works might have a significant impact on the mobility of settlements based south west of the Project's future plants (Lopé Tambagour, Lopé Kanseny, Lopé Kalisse, Lopé Koye, Kantambafenda, etc.). These latter are connected to the national road by a path that crosses the site area of the infrastructure. It is this track that the inhabitants of the settlements use to go to the weekly market in Tinguilinta, to visit the healthcare infrastructure or even to visit their families and friends located in Sangarédi, Boké and the rest of the country.

This impact will have a low magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be minor.

The main mitigation measure that can be considered in order to reduce the significance of this impact particularly consists of building an alternative path (and crossing points over watercourses) in order to avoid the isolation of the cited settlements.

The implementation of these mitigation measures will result in a negligible residual impact during the construction phase.

Interference with road traffic

Traffic disruptions must be considered on the national road, which connects Tanéné to Sangarédi during the construction of the processing facility. The principal sources of impact are:

- the rail spur, which may divide the national road; and
- the traffic of trucks involved in the construction of the bauxite stockpile pads, sorting and crushing plant.

This impact will have a medium magnitude during the construction phase, and its receptor a low sensitivity. The significance of the impact will therefore be minor.

The main mitigation measure to moderate the significance of this impact is providing an alternative path in order to allow the population to continue to travel throughout the construction phase.

The implementation of these mitigation measures will result in a negligible residual impact during the construction phase.

Table 15.11 Mine area - impacts of the project's physical footprint on mobility, flows and transport during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Isolation of settlements: Lopé Tambagour, Lopé Kanseny, Lopé Kalisse, Lopé Koye, Kantambafenda, etc.	*Low*	- To build alternative tracks (and crossing points over watercourses) in order to avoid the isolation of the cited settlements: Lopé Tambagour, Lopé Kanseny, Lopé Kalisse, Lopé Koye, Kantambafenda, etc.	*Negligible*
Movement difficulties	*Low*	- To provide an alternative path in order to allow the population to continue to travel throughout the construction phase.	*Negligible*

15.2.2.11 Impacts on cultural heritage

Physical deterioration of tangible heritage sites

Direct impacts to cultural heritage would result from ground disturbing activities and the construction of the processing plant, haul roads, rail connection, and access roads, as well as other project related activities that would involve vegetation clearing or sub-surface excavation for process plant. These types of activities would directly impact both living heritage sites, such as *Djinn* locations and cemeteries, and archaeological resources.

Four sites have been identified on the site area of the future process plant (which includes the footprint of the infrastructure, the space between the future infrastructure and the national road and a 100 m buffer zone to the south and to the east of these infrastructure, *cf. Figure 15.3* Physical footprint of the proposed processing facility in the MA

- *Bèrdhè Ley Saré Ka Thierno Mamma* is a very important family cemetery, considered to be highly sensitive.

- *Pitahoun Ka Thierno Alhassana* is a genies residence site (sacred forest), considered to be reproducible and with a medium sensitivity.

- *Ka pont* is a genies residence site (sacred forest), considered to be reproducible and of medium sensitivity.

- *Paméhoun N'dadhé Pompo* is a genies residence site (small grotto of the river Pompo), considered to be reproducible and of medium sensitivity.

In the worst case scenario, the development of the Project could cause a removal of these sites, or more likely a deterioration of the access conditions or even a change of the environment and conditions of the sites (pollution by dust, modification of the water courses, damage to the aesthetics of the site, vibrations, noise, etc.).

Moral damages associated with cultural heritage disturbance / setting change

Indirect impacts to cultural heritage could result from a change to their setting. Living cultural heritage, such as cemeteries and *Djinn* locations, that are located within an estimated maximal distance of 300 meters of a project component may experience a reduction in their perceived value by stakeholders as a result of noise, visual impacts, or reduction in accessibility. These indirect impacts have a lower magnitude when compared to direct impact from ground disturbing activities, and typically do not apply to archaeological resources.

The development and operation of the mine will also increase the presence of domestic and foreign workers in the Project area, exposing archaeological sites to greater access and thus increased potential for damage as a result of unsanctioned or inadvertent trespassing into sacred areas, such as *Djinn*

locations. These indirect impacts could occur during both the construction and operation phases of the proposed Project.

During the consultations, the populations insisted that if the sites were destroyed or tampered with by GAC or its subcontractors without prior consultation with the persons in charge of these sites, this could harm the occupants of the territory directly or indirectly. The impacts of the Project on the cultural heritage could both concern the tangible heritage (sites), and also the intangible heritage (practices, rituals).

The construction works may therefore firstly weaken the religious, spiritual or cultural practices that are associated with the heritage sites, and damage the relationship between the project and the local communities since they believe that this damage will harm the communities (release of uncontrolled hidden forces according to local beliefs).

The sensitivity of cultural heritage users is generally considered high in the entire MA since communities perceive this issue as one of high importance. Depending on the cultural value and reproducibility of cultural heritage sites, receptors sensitivity can vary between low and high. Impacts magnitude is high for physical deterioration and medium for changes of setting. Impact significance is presented in *Table 15.12.*

The Project should develop a Cultural heritage management plan including guidelines for the implementation of the following mitigation and management measures to reduce the magnitude and thus significance of impacts from the proposed Project.

Avoidance of cultural heritage

The most effective method to reduce impacts to cultural heritage is through avoidance via Project redesign.

Field investigation of potential archaeological sites

For those potential archaeological sites that cannot be avoided by construction activities, the Project should sponsor a systematic field investigation program. The purpose of the program would be to determine which if any of the sites are in fact archaeological sites and, for any that is, to determine their sensitivity in terms of archaeological, cultural or spiritual importance. This field investigation should be directed by a professional archaeologist with experience in West African archaeology, supported by local specialists.

Archaeological rescue (i.e., data recovery) excavations

For any archaeological sites identified during the field investigation of potential archaeological sites that cannot be avoided by construction activities, the Project should sponsor archaeological rescue excavations prior to construction in the area of the sites. The purpose of these excavations would be to recover as much data about the sites as possible before they are impacted by the Project

(preservation by records). The excavations could target a selected number of sites (e.g., high importance sites) and should be directed by a professional archaeologist with experience in West African archaeology, supported by local specialists.

Cemetery relocation

Cemeteries that will be directly impacted by ground disturbing activities should be relocated. Consultation with the community that uses the cemetery should take place in advance of any cemetery relocation. Cultural traditions should be respected, and it is likely that a local religious authority will need to be present during grave exhumation and re-interment. Relocation should be directed by local specialists with support from a professional archaeologist with West African experience.

Djinn (sacred site) relocation

Relocation is a possible option for mitigating impacts to *Djinn* locations, as the ritual process to move a *Djinn* is not uncommon in this part of West Africa. The process of moving a *Djinn* location usually involves the ritual relocation of the spirit to a new setting by a religious authority and should be preceded by local stakeholder engagement.

Cultural Heritage Stakeholder Engagement Program

A Cultural Heritage Stakeholder Engagement Program will be implemented to seek the input of local communities regarding the implementation of mitigation measures to reduce impacts to these living cultural resources. The program will:

- work with local stakeholders in order to make recommendations for avoidance of these resources during the construction and operation phases of the Project; and
- where avoidance is deemed to be unfeasible, establish compensation measures including, but not limited to, *Djinn*/cemetery site relocation or archaeological rescue excavations to mitigate impacts to significant cultural heritage sites.

This focused stakeholder engagement program would be implemented prior to construction. The program would continue throughout the construction and operation phases to address stakeholder concerns as they arise.

Cultural heritage training of workers

The Project will establish a Cultural Heritage Training Program for project management and for the construction contractor's management and field staff. The objective of the Cultural Heritage Training program is to manage potential impacts to known and unknown cultural heritage sites by facilitating the identification and reporting of potential Chance Finds encountered during construction activities. The program will consist of a lecture and classroom training, Chance Finds tool box talks/training for field staff, and the

development of reference materials such as fliers, signage, and educational posters to be posted in construction camps and facilities. This training will be designed and delivered by an experienced international cultural heritage specialist and will cover:

- identifying Chance Finds in the field;
- local sensitivities to cultural heritage resources;
- sensitivity of cultural heritage sites to looting and legal penalties for looting or the removal of cultural heritage sites;
- chance Finds reporting procedures; and
- the consultation process with local and national stakeholders and regulatory agencies.

The presence of construction personnel with training in the identification and reporting of Chance Finds will limit the need for monitoring by an on-site professional archaeologist to construction activities in the vicinity of known or suspected cultural heritage sites.

Development and implementation of a Chance Finds Procedure

A Chance Finds Procedure is intended to provide responses and actions that should be implemented in the event of chance discovery of heritage resources. It thereby supports the management of impacts to suspected, and unknown cultural heritage sites during construction activities. It defines the protocols and procedures for assessing unanticipated cultural heritage sites or materials encountered during construction activities.

By following the above mentioned mitigation measures, it is possible to reduce the impact significance for the *Djinn* locations and cemeteries. The residual impacts for potential archaeological sites depend on whether or not they appear to be archaeological sites and, if so, on their importance.

Table 15.12 Mine area - impacts of the project's physical footprint on cultural heritage during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Direct Impact to Cemeteries from Ground Disturbing Activities	*Major*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage, proposed mitigation measures and coordinate on relocations - Relocate cemeteries in coordination with local population in particular with regard to their preferences regarding relocation practices and locations - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Direct Impact to *Djinn* Locations from Ground Disturbing Activities	*Moderate*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage, proposed mitigation measures and coordinate on relocations - Relocate *Djinn* in coordination with local population in particular with regard to their preferences regarding relocation practices and locations - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Negligible*
Direct Impact to potential archaeological sites that are found NOT to be archaeological sites, or to be replicable (low importance) archaeological sites	*Unknown (Minor to Major)*	- Investigate potential archaeological sites to confirm their importance - Develop and implement of a Chance Finds Procedure to ensure suspected or unknown sites are discovered on time and managed appropriately - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Direct Impact to potential archaeological sites found to be archaeological sites that are critical (high importance) or non-replicable (medium importance)		- Investigate potential archaeological sites to confirm their importance - Avoid groundwork and construction on critical (high importance) cultural heritage sites - Avoid or excavate and preserve by recording non-replicable (medium importance) cultural heritage sites - Develop and implement of a Chance Finds Procedure to ensure suspected or unknown sites are discovered on time and managed appropriately	*Minor*

		- Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	
Indirect Impact to the Cultural Setting of Cemeteries	*Moderate*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage and proposed mitigation measures - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Indirect Impact to the Cultural Setting of *Djinn Locations*	*Moderate*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage and proposed mitigation measures - Through stakeholder engagement, confirm the sensitivity of changes to *Djinns* cultural settings and assess the need for relocation - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Impact to all categories of cultural resources through the increase of non-local workers	*Minor*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage and proposed mitigation measures - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Negligible*

15.2.2.12 Impacts on the landscape

The *Chapter 8* assesses the impacts of the Project on landscape within the mine area, described in *Section 8.8.* The visual resources context includes different aspects such as landscape character areas, view and visual amenity. Those result from the combination of different environmental factors such as topography, geology, forests, woodland, biodiversity, ridgelines, water courses which contribute to landscape through the visual, aesthetic or scenic quality of the environment.

The opening of access roads and the vegetation clearance and construction works of the infrastructure area will affect the landscape of the area. The lighting of the work sites might also constitute a source of light pollution for the surrounding populations. The sensitivity of the receptors is medium and the magnitude of the visual impacts is expected to be medium during the construction phase of the Project. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to remove and dismantle worksites and machinery after construction;
- to use the lowest possible level of lighting as long as it is sufficient to enhance the night time visibility required for safety and security; and
- to use specifically designed lighting equipment that minimizes the upward spread of light near to and above the horizontal.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. The significance of the impact will be reduced insofar as the source of the impact will be mitigated and the deterioration of the landscape will be limited.

Table 15.13 Mine area - residual impacts on landscape and visual amenity

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Landscape and visual effects	Moderate	- To remove and dismantle worksites and machinery after construction; - Use the lowest possible level of lighting as long as it is sufficient to enhance the night time visibility required for safety and security. - Use specifically designed lighting equipment that minimizes the upward spread of light near to and above the horizontal	*Minor*

15.2.3 Operation phase

15.2.3.1 Sources of impact

The operational phase will correspond to the start-up of the mining of the bauxite plateaus of the MA, which will result in, the change of allocation of land currently dedicated to other uses (housing, farmland, pastures, etc.).

Haul roads will connect the mining areas to the processing facility. New tracks roads will have to be built; existing tracks roads will have to be upgraded, involving the construction of bridges over watercourses.

In the scenario providing for production of 18 Mtpa, 28 heavy goods vehicles will operate in the MA within the Project's framework, and 52 other site trucks (including 6 minibuses and 25 light goods vehicles). This data do not take account of the fleets of vehicles and trucks of the subcontracting companies of the Project. Estimates of the Projects vehicles on site during the operational phase are given in *Table 15.14.*

Table 15.14 Estimate of the requirements for mining trucks and vehicles during the operational phase

Heavy-duty vehicles	**18 MTPA**
45t backhoe loaders (mine)	4
Dump trucks (150t)	12
Drill rig	8
45t backhoe loaders (train)	4
TOTAL	28
Other vehicles	**18 MTPA**
Miscellaneous site trucks	21
Minibus	6
Light vehicles	25
TOTAL	52

ERM modified, Source: Hatch, 2015: number of vehicles derived from a 8 and 12 Mtpa scenario.

The movements of the Project's vehicles and trucks should be concentrated on the plateaus being mined and the tracks connecting these plateaus to the process facility and other mining infrastructure (crushing plant), and the national road connecting Kamsar to Tinguilinta.

The trains that have to transport the ore from the crushing plant in the MA to the Kamsar port infrastructure will begin to operate on the new bifurcation track then on the existing railway that runs along the north of the MA from Boundou Lengué to Gadha Rail. It is planned that no more than 4 trains of 120 wagons will run each day between the MA and the Port.

Hazardous materials might be warehoused and used for mining purposes (fuel, small quantities of maintenance chemicals).

The mining of the bauxite plateaus would finally have to be facilitated by blasting operations.

15.2.3.2 Impacts on demographics and social dynamics

Change in the traditional family structure

The physical and economic displacements of the populations of the communities that will be affected by the mining of the bauxite plateaus might result in a change in the family structure of the persons affected whose mechanisms have already been described in *Section 15.2.2.2*.

This impact will have a large magnitude due to the higher number of persons potentially affected by the physical and economic displacement during the operational phase than during the construction phase, where 6 villages are located in the buffer zone around the process facilities. Since the sensitivity of the receptor is high, the significance of the impact will therefore be major.

The planned measures to mitigate the significance of this impact are similar to those planned in the construction phase.

The residual impact after the implementation of these compensation measures would be moderate.

Loss of cultural markers and identity

The potential physical displacements affected by the mining of the bauxite plateaus could result in a loss of cultural identity markers for the populations concerned, on the same principle as those affected by the displacements and the resettlements during the construction of the infrastructure.

This impact will be the same as for the construction phase and would affect several areas located on the MA. Its magnitude would therefore be medium, and the sensitivity of receptor high. The significance would therefore be major in the operational phase.

The mitigation measures are identical and have been designed to both limit the magnitude of the impact and the sensitivity of the populations to this impact (see *Section 15.2.2.2*). The residual impact will therefore be moderate.

Increase in social tensions

Following possible resettlement of the persons affected by the mining of the bauxite plateaus, resettled communities, host communities and communities not affected by the resettlement will have to co-exist. Unequal treatment of these three types of communities by the Project upon the implementation of the mitigation measures could result in an upsurge in tensions between communities, as explained in *Section 15.2.2.2.*

This impact magnitude will be large during the operational phase, with a high sensitivity; therefore the significance of the impact will be major.

The planned mitigation measures to mitigate the significance of this impact are the same as during the construction phase (see *Section 15.2.2.2*).

The implementation of these mitigation measures will result in a moderate residual impact.

Table 15.15 Mine area - impacts of the project's physical footprint on demographics and social dynamics during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Change in the traditional family structure	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2. - To develop and implement a Local Development Plan with the aim to support income-generating activities for the displaced persons. - To implement a preferential hiring and sourcing procedure in favor of people directly affected by the resettlement (subject to availability and skills of the applicants for each job to be filled).	*Moderate*
Loss of cultural markers and identity	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by securing land rights to the displaced people and by taking into account dependency relationships between families and community lineages in the selection of displacement areas.	*Moderate*
Increase in social tensions	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by developing collective compensation programs in benefits of hosts and displaced households, engaging regularly with local communities and by taking into account dependency relationships between families and community lineages in the selection of displacement areas.	*Moderate*

15.2.3.3 Impacts on local authority, governance and civil society

Weakening of methods of traditional governance

The authority of the traditional power, which mostly relies on its control of the management of collective land areas, might be weakened by the loss of the control of the land requisitioned by the mining of the bauxite plateaus and land identified for the resettlement of the displaced persons. Tensions might arise between the Project and the representatives of the communities potentially displaced if these latter are not involved in the resettlement process.

This magnitude will be medium in the MA and receptors have high sensitivity, therefore the significance of the impact will be major.

The planned measures to mitigate the significance of this impact are the same as during the construction phase (see *Section 15.2.2.3*).

The implementation of these mitigation measures will result in a moderate residual impact.

Table 15.16 Mine area - impacts of the project's physical footprint on local power, governance and civil society during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Weakening of methods of traditional governance	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2 in particular by involving local authorities in the decision and organization process of the displacements (e.g. selection of areas, organization of displacements, restoration programs, etc.).	*Moderate*

15.2.3.4 Impacts on the current traditional land management system

Increase in social tensions on the land resource

The increase in social tensions on the land resource during the operational phase will be similar to that of the construction phase but will affect a larger part of the MA (see *Section 15.2.2.4*Increase in social tensions on the land resource).

This impact magnitude will be larger during the operational phase than in the construction phase, and has a high sensitivity for the communities; therefore the significance of the impact will be major.

The planned mitigation measures to mitigate the significance of this impact are the same as those planned in the construction phase. In addition, the LRRF and RAP will:

- explore the legal options that will allow creating restriction areas in which no newcomer will be authorized to develop assets whereas these areas have to be acquired in the short or medium term; and
- to resettle the PAPs within a maximum of two years after a possible construction moratorium.

In addition, mining plateaus will be progressively rehabilitated to allow for re-vegetation or preparation of the land for agriculture, depending on stakeholder expectations, to limit the pressure on the resource.

The implementation of these mitigation measures will result in a moderate residual impact.

Inequality of access to land

The physical footprint of the bauxite plateaus that could potentially be mined is large in the MA, since it represents about 17% of the total area. The requisition of land by the Project during the operational phase will result in a progressive rarity of the resource during the first years prior to the start of the progressive mining pits rehabilitation process.

In the context of growing land pressure, the land lending system between lineages and settlements might be affected, with the development of new strategies by the holders of strong rights over the land in order to secure their hold over the land in favor of their families, lineages and communities (development of perennial crop plantations particularly on spaces initially dedicated to shifting crop-growing of annual foodstuffs). In this context, the households recently arrived, which usually depend on annual loans renewed until now by founding families, may be progressively excluded from access to land (landless farmers).

This impact magnitude will be large during the operational phase and receptors have a high sensitivity, therefore the significance of the impact will be major.

The implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above is expected to mitigate the significance of this impact by:

- compensating both holders of formal rights (rights of administration) and informal rights ;
- to select resettlement sites for the displaced populations that offer similar economic opportunities in terms of quantity and quality of available land;
- to help securing land rights of the displaced persons in their place of resettlement; and
- to support projects to develop income-generating activities for displaced persons, and particularly persons displaced for economic reasons.

The implementation of these mitigation measures will result in a moderate residual impact.

Table 15.17 Mine area - impacts of the project's physical footprint on land tenure during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in social tensions on the land resource	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by: • involving local authorities in charge of land management; • favoring collective compensation measures; • engaging regularly with the local population. • exploring the legal options with regard to a cut-off date and restrictions with regard to newcomers installation; and • setting a maximum of two years' time limit for resettlement after a possible construction moratorium. - To use a grievance mechanism that is widely known by the local authorities and runs effectively and transparently. - To progressively rehabilitate mining plateaus to allow for re-vegetation or preparation of the land for agriculture, depending on stakeholder expectations, to limit the pressure on the resource.	*Moderate*
Inequality of access to land	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by • compensating both holders of formal rights (rights of administration) and informal rights ; • selecting resettlement sites for the displaced populations that offer similar economic opportunities in terms of quantity and quality of available land; • help securing land rights of the displaced persons in their place of resettlement; and • supporting projects to develop income-generating activities for displaced persons, and particularly persons displaced for economic reasons.	*Moderate*

15.2.3.5 Impacts on agriculture and cattle herding

Decrease in the cattle herding practice

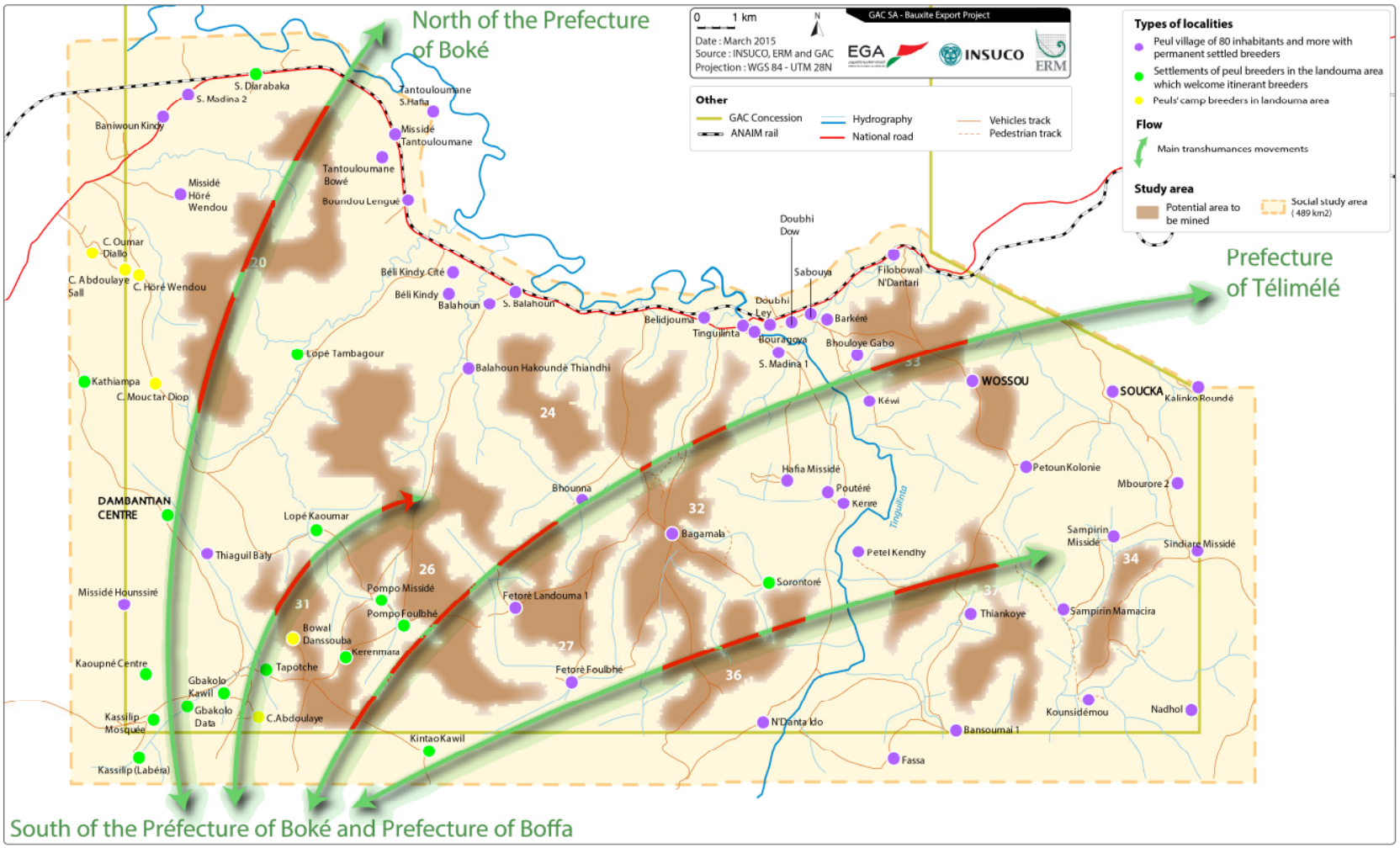
The spatial coverage of the future bauxite mining pits and haul roads could encroach upon land used for cattle herding, and result in:

- a reduction in the number of heads of cattle owned or even abandoning of the activity by the settled cattle herders;
- the economic displacement of camps of transhumant cattle herders who no longer have access in the MA to host land, even seasonal; and
- obstacles on the transhumance flows, particularly those of cattle herders located to the north and to the east of the MA and who cross this area during the dry season (cf. *Figure 15.1).*

The phenomenon will be even more significant given that the *bowés*, which are directly located on the exploitable bauxite plateaus, are the favored areas for cattle herding.

This trend as to the reduction of cattle herding activities could be exacerbated by the risks of collisions between the herds and the mining trucks near the exploited plateaus and the crushing plant. In the settlements to the north-west of the MA, the risks of collision with the trains that transport the ore might also dissuade the cattle herders from continuing their activity.

Figure 15.4 Impact of the physical footprint on the cattle herding and transhumance flows in the mining area



This impact magnitude will be large during the operational phase and receptors have a high sensitivity, therefore the significance of the impact will be major.

The planned mitigation measures to mitigate the significance of this impact are the same as during the construction phase (see *Section 15.2.2.5*).

Additional mitigation measures are:

- stakeholder engagement will comprise information to the communities on the blasting works timings and carry out temporary evacuations if necessary;
- mining plateaus will be progressively rehabilitated to allow for re-vegetation or preparation of the land for herding, depending on stakeholder expectations.

The implementation of these mitigation measures will result in a moderate residual impact.

Decrease in agricultural production

The physical footprint of the mining areas (exploitable plateaus and haul roads) of the Project might encroach upon land initially dedicated to agricultural activities: annual crop-growing fields and fallow land, plantations of perennial crops and, to a lesser magnitude, market gardens and palm groves located near watercourses. The reduction in farming areas might result in increased pressure on the land resource and a reduction in the fallow time required for the regeneration of the fertility of the soil. The agricultural yields might be significantly affected in the subsistence crop-growing fields.

Potential impacts on surface water quality from accidental spills of fuel or turbid run-off from the mining area could affect farming yields in the palm groves and the market gardens. This same dust could be deposited on the fruit trees and annual crops and have a negative impact on the production yields (fall in photosynthetic activity), and also reduce the presence of herds and therefore a change in the fertility represented by animal fertilization in the fields.

Finally, the blasting operations could induce the chronic interruption of rural activities in a limited area (temporary buffer zone of 800 m during blastings).

All of these factors could contribute to significantly reducing the farming production in the construction area of the process facility and other mining infrastructure.

This impact will have a large magnitude (magnitude of loss of agricultural lands has been assessed in environmental impact assessment *Section 8.9* as large) during the operational phase throughout the MA since more land will be

impacted, and receptors have high sensitivity. The significance of the impact will therefore be major.

The planned measures to mitigate the significance of this impact are similar to the mitigation measures in the construction phase but will be implemented on a larger scale.

In addition, mining plateaus will be progressively rehabilitated to allow for re-vegetation or preparation of the land for agriculture, depending on stakeholder expectations.

The implementation of these mitigation measures during the operational phase is expected to reduce the significance of the residual impact to moderate.

Decrease in food security

The impact on food security will be the same in the operational phase as in the construction phase to the extent that the mining activities will generate a loss of natural resources that households use to consume; but, whereas its magnitude was low in the construction phase, it becomes large in the operational phase because it affects all the persons of the IA and the persons of the RA living from agriculture which have a high sensitivity to the impact.

The planned measures to mitigate the significance of this impact are the same as those planned in the construction phase (see *Section 15.2.2.5*) but will be implemented on a larger scale.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase. These measures would decrease the significance of the impact (through a careful finalization and optimization of the mining plan and increased access to other economic resources).

Increase in conflicts between farmers and cattle herders

The phenomenon of an increase in conflicts between farmers and cattle herders will be the same during the operational phase and in the construction phase but more farmers and cattle herders will be concerned. Therefore, its magnitude will be medium during the operational phase throughout the MA, and sensitivity of receptors will remain high.

The planned mitigation measures are identical to those recommended in the construction phase (see *Section 15.2.2.5*).

The implementation of these mitigation measures would allow for reducing the significance of the impact by demarcating the crop-growing areas and the pasture areas. Thus, the implementation of measures will result in a moderate residual impact during the operational phase.

Table 15.18 Mine area - impacts of the project's physical footprint on agriculture and cattle herding during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in the cattle herding practice	*Major*	- **To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by developing individual and collective compensations for the displaced cattle herders (e.g. securing alternative pasture land and water sources, provisioning of technical training courses and support to animal health, etc.) and by securing the mining areas with mounds and fences in order to limit interactions of Project mobile equipment and vehicles with herds and ruminants.** - To implement a Local Development Plan and development programs to further support cattle herding in the MA. - To ensure stakeholder engagement comprise information to the communities on the blasting works timings and carry out temporary evacuations if necessary. - To progressively rehabilitate mining plateaus to allow for re-vegetation for herding, depending on stakeholder expectations.	***Moderate***
Decrease in agricultural production	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by: • minimizing the encroachment on the lands with the greatest agricultural potential; • compensating for the loss of agricultural land particularly by the replacement of this land with high farming potential development land when possible ; • compensating both holders of strong rights (rights of administration) and simple use rights; and • the development of agricultural development projects. - To manage the site with respect to best industry practice in particular the management of hazardous substances and spill risks and the impacts related to traffic and dust on site through the development and implementation of a Dust management plan, Traffic management plan and a Hazardous materials management and spill prevention & response plan. - To progressively rehabilitate mining plateaus to allow for re-vegetation or preparation of the land for agriculture, depending on stakeholder expectations.	*Moderate*
Decrease in food security	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by provisioning of financial compensation or compensation in kind throughout the transition period necessary for the displaced households to recover their agricultural production levels.	*Moderate*
Increase in conflicts between farmers and cattle herders	*Major*	- Help villages in securing crop-growing areas that are source of conflict (installation of fencing). - Help villages and herders to find collective solutions to reduce risk of conflicts such as defining alternative routes or grazing areas, organizing a shared fertility management scheme or any other solution discussed and agreed with the communities and herders.	*Moderate*

15.2.3.6 Impacts on access to natural resources availability

Deterioration of the surface water availability

The surface water is used in the MA for household consumption, personal hygiene, dish washing, irrigation of gardens and even the watering of animals. These are springs and permanent and temporary watercourses near residential areas but also near areas dedicated to farming and cattle herding where most of the population spends most of its working time.

The careful pumping of water from Tinguilinta river located near the future infrastructure in order to supply potable water to the Project when water level is above a definite level is not expected to affect significantly the water regime of the river. However the run-off of likely industrial effluents could pollute the surrounding surface water.

The subsoil of the bauxite plateaus fills with water during the rainy season, and these water reserves are progressively released into the natural environment and allow for the sustainability of certain watercourses even at the height of the dry season. Eight springs have been located : seven of them are located along the boundaries of the exploitable bauxite plateaus and the eight one only a few dozens of meters away from a boundary. These springs are particularly important for the local communities which is reflected in the fact that they often correspond to heritage sites worshipped by the communities (4 of the springs identified correspond to genies residences). These springs discharge into the rivers that run near some residential areas, particularly in the valleys.

The assessment of impacts on surface water availability and quality from mining operations and haul roads is assessed in detail in *Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum. Considering the assessed impact significance and the proposed mitigation measures of 300 m buffer zones for headwaters presented in that chapter, the potential residual impacts on surface water is considered negligible to minor.

This impact is expected to have a low magnitude during the operational phase throughout the MA while receptors have a high sensitivity. The significance of the impact will therefore be moderate.

An additional mitigation measure to mitigate the significance of this impact for the local populations is to develop and implement a Local Development Plan in particular by improving access to water near affected housing areas through stakeholder engagement (population proposed solutions such as types of works, locations, operating and maintenance conditions, etc.).
The residual impact in this phase would be minor after the implementation of mitigation measures.

Decrease in economic opportunities related to use of natural resources

The uses of natural resources are diverse and represent important resources for the economy and for the local social organization.

Several resource areas for hunting, fishing, collection of timber, firewood and building materials, harvesting of food-related products or even medicinal plants could be affected by the mining of the bauxite plateaus and by the opening-up of new haul roads. Harvesting is common across the study area although it does not represent a significant source of income or food for households.

In addition to the change of allocation of the land, the noise pollution caused by the blasting works, and the traffic of the trucks could chase away wild animals.

Fishing is an important subsistence activity for villagers living close to watercourses. This is typically subsistence fishing and approximately 76% of fish caught is for consumption. Profits are reported to be small and estimated to be 150,000 GNF per year and per household (20.6 USD).

Fishing activities along the Tinguilinta showed a clear distinction between commercial activity by professional Somono fishermen (their activities are concentrated near Boké), and subsistence fishing by local populations. The group of Somono fishermen based at Tanéné was identified as the only professional fishermen on the Tinguilinta River. Their equipment consists of 4 canoes and 20 gill nets each.

The impact on fishing activities has been assessed as minor in the *Section 8.11, Freshwater ecosystems,* therefore the magnitude of loss of income related is foreseen as also minor. The sensitivity of the human receptors is considered as high and the impact is considered moderate for this activity.

Hunting, and therefore bushmeat consumption, is a common practice within local communities. Approximately 22.8% of households stated that at least one member of the family hunts in the mine area.

Approximately 50% of products deriving from hunting activities are sold. The remaining part is intended for household consumption. Bushmeat is a significant source of protein, and financial support for families.

The impact on bushmeat has been assessed in the biodiversity assessment *Section 8.10* as major therefore the loss of income related to bushmeat is foreseen to have a large magnitude during the operational phase throughout the MA while population sensitivity will be high. The significance of the impact will therefore be major.

The overall significance of the impact related to the loss of economic opportunities is moderate to major.

The planned measures to mitigate the significance of this impact are similar to those recommended in the construction phase.

In addition the Project will:

- support a research and awareness-raising project in order to consider the rational use of firewood (substitution by other fuels - waste bricks, peat, dry cow dung -, use of improved hearths, etc.) ; and
- progressively rehabilitate mining plateaus to allow for re-vegetation and use for natural resource collection depending on stakeholder expectations.

In addition, as part of the foreseen mitigation in the environmental impact assessment in *Chapter 8* hunting will be banned for all employees and there will be information and trainings to discourage hunting of wild animals.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Decrease in food security

The hunting and fishing products, the harvesting of wild tubers and berries or even the honey crop can significantly improve the diet of households (see *Section 15.2.2.6, Impacts on access conditions to natural resources).*

The probable reduction in areas for collecting these natural resources following the start-up of the mining operations could therefore have important consequences on the food security of households living close to these future mining areas.

This impact will have a medium magnitude during the operational phase throughout the MA, and the receptors medium sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are similar to those recommended in the construction phase but will be implemented at a larger scale. In addition the Project will progressively rehabilitate mining plateaus to allow for re-vegetation and use for natural resource collection depending on stakeholder expectations.

The implementation of these mitigation measures will result in a minor residual impact during the operational phase. These measures will allow for mitigating the significance of the impact by giving the impacted persons access to alternative economic and food resources.

These three types of impact can be illustrated in the *Figure 15.5.*

Figure 15.5 Impacts on consumption of natural resources

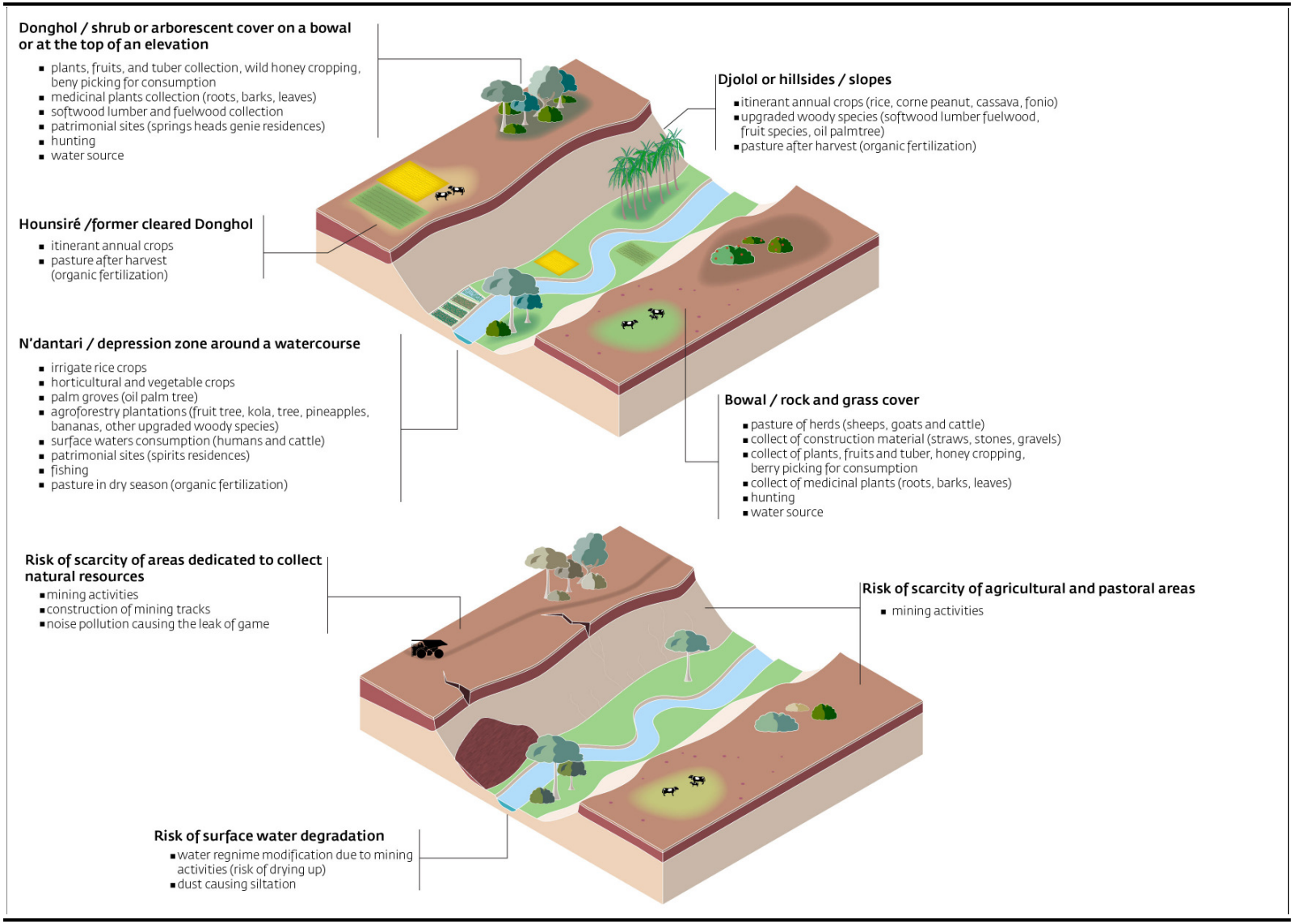


Table 15.19 Mine area - impacts of the project's physical footprint on access conditions to natural resources during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Deterioration of the access conditions to surface water	*Moderate*	- To develop and implement a Local Development Plan in particular by improving access to water near affected housing areas through stakeholder engagement (population proposed solutions such as types of works, locations, operating and maintenance conditions, etc.).	*Minor*
Decrease in economic opportunities and income related to consumption of natural resources	*Major*	- To support a research and awareness-raising project in order to consider the rational use of firewood (substitution by other fuels - waste bricks, peat, dry cow dung -, use of improved hearths, etc.). - Progressively rehabilitate mining plateaus to allow for re-vegetation and use for natural resource collection depending on stakeholder expectations. - To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2which will result in the relocation and livelihood restoration of some users of the natural resources. - To develop a Local Development Plan, in particular through programs in support of : • agricultural development ; and • economic diversification and development of alternative income-generating activities (e.g. arts and crafts, commerce, services, transformation of farm produce). - To support the creation of community forests (protected areas, managed collectively by the communities in order to protect the access to various resources). - To support at community level, the breeding of rodents (agoutis) and fishing farming projects in order to compensate for the reduction in game and fishing products.	*Moderate*
Decrease in food security	*Moderate*	- Implement above measures to mitigate the decrease in economic opportunities and income related to the consumption of natural resources.	*Minor*

15.2.3.7 Impacts on the local socioeconomic context

Decrease in income

The potential physical footprint of the mining will potentially extend over about 25%of the area of the IA and might result in economic displacement in about 30 % of the settlements and hamlets of the area. The probable loss of income related to the loss of resource spaces, which might be requisitioned during the operational phase, has already been dealt with in *Section 15.2.3.6*. The population displacements might also cause the shutting down of other activities practiced by the locals (textile works, building, food artisans, mechanics, small retail businesses, etc.) and induce an additional fall in income.

This impact will have a medium magnitude (because of the limited but still consistent number of affected communities) during the operational phase, and its receptor a high sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to mitigate the significance of this impact are similar to those planned in the construction phase, but at a much wider scale (see *Section 15.2.2.7*Decrease in income). To those proposed during the construction phase, we need to add a measure aiming to develop on the haul roads secure crossing points for the local populations.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase. These measures will in fact allow the PAPs to benefit from similar economic opportunities and alternative economic resources.

Inflation of commodity prices and the price of other local produce

The risk of inflation of commodity prices and of other local produce is the same in the operational phase as in the construction phase but has a larger magnitude, with the fall of farming production and the reduction in the practice of cattle herding affecting the entire MA.

Consequently, this impact will have a medium magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are the same as those planned in the construction phase (see *Section 15.2.2.7*, *Inflation of commodity prices and the price of other local produce*).

The implementation of these mitigation measures will result in a minor residual impact during the operational phase. Indeed, these measures will allow for limiting the significance of the impact by improving the productivity of part of the agricultural activities and by developing alternative activities.

Table 15.20 Mine area - impacts of the project's physical footprint on socioeconomic context during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in income	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2in particular by: • developing economic restoration programs and projects promoting income generating activities • the selection of displacement areas that offer similar economic opportunities ; and • the provision of financial compensation or benefits in kind throughout the transition period necessary for the displaced households to resume their economic activities. - To develop a Local Development Plan in particular that promotes alternative income-generating activities (support to the transformation and selling of farm produce). - To build alternative tracks (and crossing points over watercourses) in order to avoid the isolation of settlements. - To build secure crossing points over the haul roads for the local populations.	*Moderate*
Inflation of commodity prices and the price of other local produce	*Moderate*	- To develop a Local Development Plan, in particular by implementing projects in relation to the objectives of increase agricultural (e.g. technical courses, provision of equipment and inputs, harvest pre-financing) and herding productivity (e.g. development of forage crops, development of water points, animal healthcare program, etc.). - To support at community level, the breeding of rodents (agoutis) and fishing farming projects in order to compensate for the reduction in game and fishing products on the market.	*Minor*

15.2.3.8 Impacts on health and safety

This section assesses the potential Project impacts on communities' health & safety. Impacts and mitigation measures from noise & vibration and air-quality are described in *Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum and will not be further described in this section. Physical impacts of major significance will be mitigated through resettlement of the receptors as detailed in *Section 14.6.2.*

General increase in safety risks and diseases transmission

The presence of the Project workers during operations is likely to increase the safety risks and diseases in the MA compared to pre-project level. Interactions with workers and expatriates could result in conflicts or an increase in transmission of diseases. Mining activities could result in accidents or accidental releases of hazardous products for the population. Blasting operations might represent a source of risk for the safety of the populations living and working near the mined quarries (projectiles).

This impact will have a large magnitude during the operation phase throughout the MA, and receptors a medium sensitivity. The significance of the impact will therefore be major.

Mitigation measures are identical to those proposed in the construction phase (see *Section 15.2.2.8 , General increase in safety risks and diseases transmission*). In addition, to avoid danger from projectiles, a 800 meter buffer zone around the blasting areas will be installed where workers and population presence will not be allowed during blasting operations.

These mitigation measures apply to the following impacts related to health and safety but will not be repeated in the mitigation measures identified for each of them.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Diseases related to water and sanitation

A reduction or deterioration of the water resource available for the locals might occur during the operational phase from the risk of industrial accidents and discharges of industrial effluents (including fuel) in the natural environment.

These negative effects on the quality of the water available might result in the appearance and / or the increase of diseases (diarrhea, parasitic diseases, typhoid fever, gastro-intestinal diseases, etc.) both for the Project's workers and for the surrounding populations. The most vulnerable populations would be children, the elderly, the disabled persons, the sick persons and pregnant women.

Domestic waste will also be produced by the increased population in the MA which, if not properly manage by public services through waste collection and treatment, is likely to result deteriorated hygiene conditions.

Impacts on surface water availability and quality from mining operations and haul roads ARE assessed in detail in *Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum. After the implementation of mitigation measures the residual impact is expected to be minor.

This impact will therefore have a low magnitude during the operational phase, and receptors a high sensitivity. The significance of the impact will therefore be moderate.

The specific mitigation measures, in addition to those referred to in *Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum, are also identical to those proposed in the construction phase (see *Section 15.2.2.8*).

The implementation of these mitigation measures will result in a minor residual impact during the operational phase.

Diseases related to the displacement of populations

The populations of the settlements that are potentially displaced and/or lose access to the spaces, which ensure their traditional means of subsistence, might also find themselves affected in their physical and moral well-being (loss of markers). The likely loss of part of the means of subsistence, even temporary, of certain displaced populations might have consequences on the level of food security and health of these households.

The risk of diseases related to the population displacements might be identical in the operational phase as that of the construction phase, but its magnitude is larger.

This impact will therefore have a medium magnitude during the operational phase throughout the MA, and receptors have high sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to mitigate the significance of this impact are the same as those planned in the construction phase (see *Section 15.2.2.8*, *Diseases related to the displacement of populations).*

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Road and railway safety

The increased presence of mining trucks during the operational phase of the Project might result in an increase in the risk of road traffic accidents. Likewise, the bauxite train traffic could result in an increase in the risk of accidents in the settlements north-west of the MA.

This impact will have a medium magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

Part of the planned mitigation measures to mitigate the significance of this impact is the same as those planned in the construction phase (see *Section 15.2.2.8).*

Additional mitigation measures to mitigate the significance of this impact are:

- to put a campaign in place to raise the awareness of the population on railway safety issues;
- to secure the crossing points between haul roads and roads and the settlement tracks;
- to prohibit the access of non-authorized persons to the mining work sites;
- to fence-off the railway track and the mining sites near inhabited areas; and
- to put a bus service in place for the workers to limit vehicle numbers.

The implementation of these mitigation measures will result in a minor residual impact during the operational phase.

Employee safety

The start-up of the mining of the bauxite plateaus might result in an increase in risks for the safety of workers:

- risks of injuries, accidents and diseases related to the carrying out of physical work (particularly for the unqualified workers);
- risks of accidents in driving trucks;
- risks associated with the presence of noise, vibrations and dust;
- risks of accidents associated with tiredness (lack of attention) for the night-time workers; and
- risks of accidents associated with the handling of hazardous products (explosives handled during the blasting operations in particular) or in case of one-off events (for example fires or leaks).

This impact will have a large magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to mitigate the significance of this impact are the same as those planned in the construction phase (see *Section 15.2.2.8, Employee safety*).

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Difficult of access to healthcare

The operational phase could coincide with an increase in the difficulties of access to healthcare for a significant part of the population of the MA:

- The probable partial loss of income of certain households at the start-up of the operational phase might have consequences on the budget allocated by these households to healthcare.

- The construction of new haul roads accessible only to the Project's vehicles and the mining of certain plateaus could disrupt the movement of persons in the MA and hamper access to healthcare infrastructure (extended travel time).

- The persons potentially displaced during operation might also be resettled in the most isolated areas where access to healthcare would be more difficult.

- The possible deterioration of some areas used by traditional doctors to obtain medicinal resources (leaves, roots, barks, etc.) could have an impact on the availability of these medicinal plants and therefore on the quality of the healthcare provided by these local healthcare specialists.

This impact will have a large magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to mitigate the significance of this impact are the same as those planned in the construction phase (see *Section 15.2.2.8, Access to healthcare*) but at a wider scale. In addition the Project will build alternative tracks and crossing points over watercourses and haul roads in order to avoid the isolation of settlements.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Table 15.21 Mine area - impacts of the project's physical footprint on health and safety during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Air quality		*Refer to Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum.	
Noise & vibration		*Refer to Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum.	
General increase in safety risks and diseases transmission	*Major*	- To evaluate the risks and the impacts on health and safety to which employees and affected communities are exposed and to take the appropriate prevention measures including by developing a Health, safety and security management plan and a Community health, safety and security plan. - To use appropriate working methods and techniques to protect the environment, the safety of workers and of the surrounding populations. - To design and construct the structural elements of the Project by taking account of the risks to which the workers and the affected communities are exposed. - To reduce the potential exposure of the community to hazardous materials and substances including by developing a Hazardous materials management and spill prevention & response plan. - To select Project security personnel to ensure they are not involved in past human rights abuses. - To train Project security staff and personnel on local cultural practices and expected behaviors when interacting with local communities. - To use a Grievance Mechanism allowing the population to raise safety issues. - To inform the populations of the mining plan and the duration of exploitation of pits so as to be able to report the risks associated with the activities of the Project. - To install a 800 meter buffer zone around the blasting areas to avoid danger from projectiles where workers and population presence will not be allowed during blasting operations. - To develop a Local Development Plan, in particular with regard to the objectives to improve access to and quality of health care infrastructure and services and raise local communities awareness on hygiene, health and communicable diseases. - To reduce the production of hazardous and non-hazardous waste, to treat it and eliminate it appropriately. - To avoid or reduce and control the discharge of effluents in the environment (evaluate their production, transport, handling, stockpile and use). - To adopt anti-dust measures (truck traffic, scouring of trucks and quarries, sweeping and backfilling operations). - To construct improved water bodies in order to propose alternative solutions to the surface water supply of surrounding populations.	*Moderate*
Diseases related to water and sanitation	*Major*		*Moderate*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Diseases related to the displacement of populations	*Major*	- To develop a formal resettlement action plan (RAP) in line with GAC's commitments to Resettlement and livelihood restoration and IFC PS 5 and AfDB OS 2which will result in the livelihood restoration of displaced households while taking into account family ties and communities' lineage in the resettlement process.	*Moderate*
Road and railway safety	*Moderate*	- To adopt a traffic management plan that avoids traffic near residential areas. - To adopt a road traffic code for the entire mine area (speed limits, sign boards, control barriers at the entrance of the settlements, etc.). - To put a campaign in place to raise the awareness of the population on road and railway safety issues. - To avoid the movement of the populations on the tracks used by the mining trucks by developing alternative, safe paths. - To secure the crossing points between haul roads and roads and the settlement tracks. - To prohibit the access of non-authorized persons to the mining sites. - To fence-off the railway track and the mining sites near to inhabited areas. - To put a bus service in place for the workers to lessen vehicle numbers on the roads. - To pay for the costs of road traffic accidents where the Project's vehicles are proven liable.	*Minor*
Employee safety	*Major*	- To establish an operational health and safety management system to minimize occupational health and safety risks to workers. - To identify the potential dangers for the workers, particularly likely to constitute a threat for their lives. - To initiate measures designed to prevent accidents, injuries and diseases resulting from the work by minimizing, as much as possible, the cause of such dangers. - To safeguard the safety of the machines and equipment. - To ensure the ability to work of the workers (physical conditions). - To develop a training program for the Project's workers (direct and indirect jobs) in order to ensure that these employees have the skills, information and capacities required to manage the risks associated with the job to which they are assigned. - To provide the workers with all the protection equipment necessary for the minimization of the risks associated with the tasks carried out as part of the job. - To check compliance with the application of the aforementioned standards by the subcontractors of the Project, particularly by conducting regular audits and taking corrective measures if need be.	*Moderate*
Access to healthcare	*Major*	- To implementation of a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above in particular by: • restoring displaced people livelihoods and source of incomes; • the selection of resettlement sites that offer similar or better access to healthcare services; • developing collective compensations which will benefit to all households (hosts and displaced) such as community health facilities; and • providing for financial compensation or compensation in kind for the displaced households	*Moderate*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
		through the transition period. - To develop and implement a Local Development Plan with the objective to improve access and quality of health services and infrastructure, including by: • participating, in collaboration with the local administrative authorities, in the construction of new healthcare infrastructure and in the renovation of old ones depending on the needs; and • providing existing public healthcare services with equipment and consumables. - To build alternative tracks and crossing points over watercourses and haul roads in order to avoid the isolation of settlements.	

15.2.3.9 Impact on education

Deterioration of access to education

The possible partial loss of income of certain households further to the start-up of the operational phase might have an impact on the budget dedicated by these households to child education. The first victim of this lack of schooling would be girls.

Further, the increased movement of mining trucks during the mining of certain plateaus will be a factor of disruption for the mobility (longer travel time) and of risk for the safety of children who attend school in the neighboring settlements. *Figure 15.6* illustrates the inter-settlement movement of children who attend school. The movement is important on plateau 26 between the settlements of Pompo Missidé, Pompo Foulbhé and Kerenmara. We may also see numerous flows of pupils on plateau 32 (pupils from settlements and hamlets who travel by foot to school in Tinguilinta), and on plateau 33 (pupils who attend school in Wossou).

Further, the persons potentially displaced at the time the mining starts might be resettled in more isolated areas which could result in decreased access to education infrastructure.

This impact will have a large magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be major.

The planned measures to mitigate the significance of this impact are identical to those planned in the construction phase (see *Section 15.2.2.9, Access to education*) but with a wider scale.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Table 15.22 Mine area - impacts of the project's physical footprint on education during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Access to education	*Major*	- To implement a RAP in accordance with the principles of a LRRF as developed in *Section 14.6.2* above in particular by: • restoring displaced people livelihoods and source of incomes; • the selection of resettlement sites that offer similar or better access to education; • developing collective compensations which will benefit to all households (hosts and displaced) such as the construction of community schools; and • providing for financial compensation or compensation in kind for the displaced households through the transition period to ensure continued payment of education charges by households. - To develop and implement a Local Development Plan with the objective to improve access and quality of education, including by: • participating, in collaboration with the local administrative authorities, in the construction of new schools and in the renovation of old ones depending on the needs; • providing existing public schools with educational materials and consumables; and • developing a study bursary system for the pupils and students of the poorest households, for those living in particularly isolated areas and to encourage the education of girls. - To build alternative tracks (and safe crossing points of watercourses and haul roads) in order to avoid the isolation of settlements and propose safe paths so that children can attend school.	*Moderate*

15.2.3.10 Impact on mobility, flows and transport

Isolation of settlements

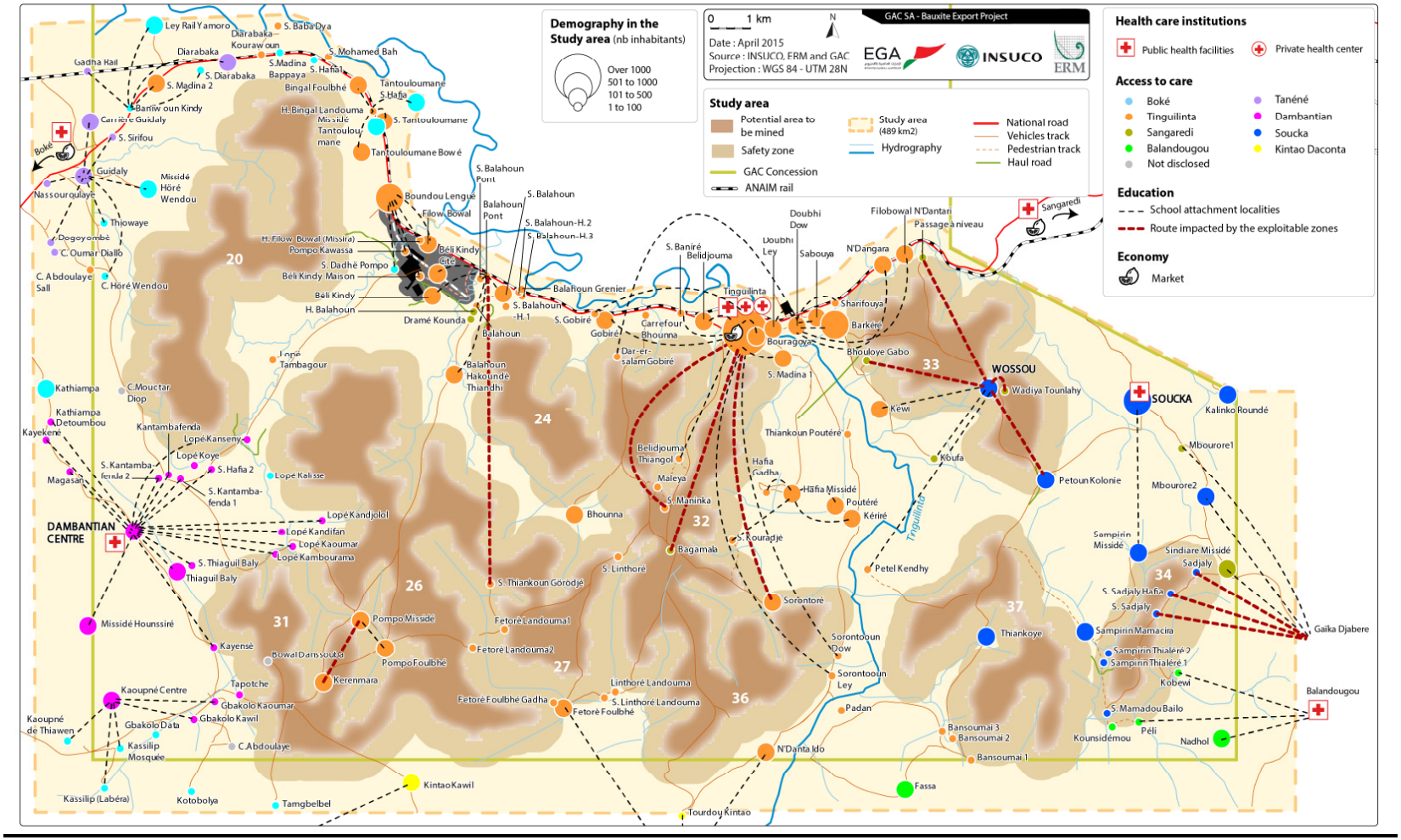
The mining of the bauxite plateaus and the opening of new haul roads used solely by the Project's vehicles and trucks might have a significant impact on the mobility of the population of the settlements located either side of the mining areas.

From the point of view of the Tanéné Sub-Prefecture, the national road and the healthcare, education infrastructure and even the Tinguilinta market exercise a strong power of attraction for most of the settlements and hamlets of the IA. The communities located in the south of the mined plateaus might be particularly affected by the mining of plateaus 24, 26, 27 and 32 (see *Figure 14.1*).

From the point of view of the Sangarédi Sub-Prefecture, the main centers of attraction are once again the national road, the infrastructure of Tinguilinta, and the primary school of Wossou and the Soucka healthcare station. The mining of plateau 33 would particularly affect the settlements and hamlets located to the south of this latter.

The risks of isolation of the settlements are illustrated in *Figure 15.6.*

Figure 15.6 Impact on access to education and healthcare infrastructure and to the market



In addition, several settlements (including Tantouloumané, Filow Bowal and Diarabaka) located in the north-west of the MA are separated from part of their territory (peripheral hamlets and crop-growing areas) by the railway spur. The Project's train traffic will negatively affect the movement conditions of the inhabitants of these communities even inside their respective territories.

The isolation of the villages of the MA would have a large magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to mitigate the significance of this impact are:

- to build alternative tracks (and crossing points of watercourses) in order to avoid the isolation of settlements, in collaboration with the populations concerned and the local administrative authorities (within the framework of the LDP in particular);
- to develop crossing points for pedestrians and vehicles (ground crossings) over the railway tracks in the villages of Diarabaka, Tantouloumané and Filow Bowal;
- to secure crossing points between haul roads and roads and the settlement tracks; and
- to clarify the status of the haul roads and other structures (bridges) as regards a possible use by villagers.

In order to improve access of the villages located in the south of the MA and avoid too great movements of persons and goods in the operating areas (bauxite plateaus), it might be relevant to overhaul and extend to the east the track that goes through Tapotche, Kassilip Mosquée and directly leads to the Urban Commune of Boké. Tinguilinta and the national road between Tanéné and Sangarédi would lose their appeal for the settlements and hamlets of the south of the MA in favor of the regional capital.

The implementation of these mitigation measures will result in a minor residual impact during the operational phase.

Table 15.23 Mine area - impacts of the project's physical footprint on mobility, flows and transport during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Isolation of settlements	*Major*	- To build alternative tracks (and crossing points of watercourses) in order to avoid the isolation of settlements, in collaboration with the populations concerned and the local administrative authorities (within the framework of the LDP in particular). - To develop crossing points for pedestrians and vehicles (ground crossings) over the railway tracks in the villages of Diarabaka, Tantouloumané and Filow Bowal. - To secure crossing points between haul roads and roads and the settlement tracks. - To clarify the status of the haul roads and other structures (bridges) as regards a possible use by villagers. - To overhaul and extend to the east the track that runs through Tapotche, Kassilip Mosque and leads directly to the Urban Commune of Boké.	*Minor*

15.2.3.11 Impacts on cultural heritage

Physical deterioration of tangible heritage sites

Of the 230 living heritage sites (which includes *Djinn* locations and cemeteries) recorded in the study area, 15 would be directly impacted by planned ground disturbing activities. One of these sites is a high sensitivity cemetery and the remaining 14 are *Djinn* locations of low (10 sites) and medium (four sites) sensitivity. In addition to the living heritage sites, there are 12 archaeological anomalies that would be directly impacted by planned ground disturbing activities. Confidence levels of whether these anomalies are in fact real archeological sites of importance were assigned based on aerial imagery analysis. Two are high confidence, four are medium confidence, and six are low confidence sites. Because these sites have not been assessed in the field, it is not possible to determine their sensitivity and thus their impact significance.

Setting changes

Indirect impacts to cultural heritage could result from a change to their setting. Living cultural heritage, such as cemeteries and *Djinn* locations, that are located within 250 meters of a project component may experience a reduction in their perceived value by stakeholders as a result of noise, visual impacts, or reduction in accessibility. These indirect impacts have a lower magnitude when compared to direct impact from ground disturbing activities, and typically do not apply to archaeological resources. In total, 45 living heritage sites are located within 250 meters of a planned project component. Of these, 15 are high sensitivity cemeteries. The remaining 30 sites are *Djinn* locations, six of which are high sensitivity, three of which are medium sensitivity, and 21 of which are low sensitivity. These indirect impacts apply to both the construction and operation phases of the proposed Project.

The development and operation of the mine will also increase the presence of domestic and foreign workers in the Project area, exposing archaeological sites to greater access and thus increased potential for damage as a result of unsanctioned or inadvertent trespassing into sacred areas, such as *Djinn* locations.

Figure 15.7 Cultural heritage sites recorded on the MA

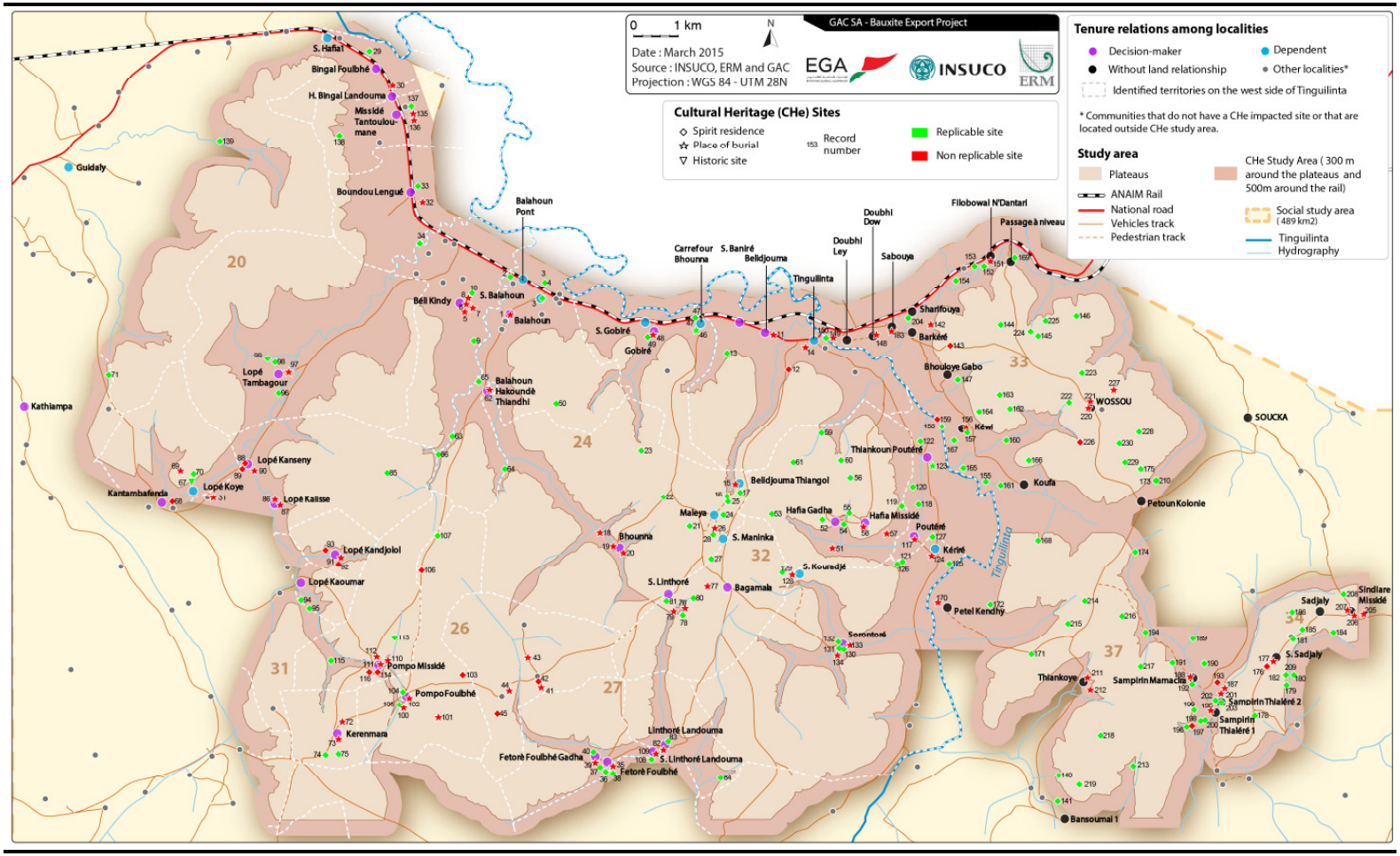


Table 15.24 Reproducibility of the cultural heritage sites on the exploitable plateaus

	Reproducible	Non-reproducible	Total
Number of cultural heritage sites on the exploitable plateaus and the haul roads	*33*	23	*56*

Out of the 230 cultural heritage sites identified in the MA, 56 are located on exploitable plateaus. 33 are reproducible and 23 are non-reproducible. The extent to which the sites will be affected will be known only when the final Mining Plan will have been developed.

The mining of the plateaus and the opening of haul roads could cause a degradation or removal of these sites, or more likely a deterioration of the access conditions or even a change of the environment and the conditions of the sites (pollution by dust, modification of the water courses, damage to the aesthetics of the site, vibrations, noise, etc.).

The sensitivity of cultural heritage users is generally considered high in the entire MA since communities perceive that this issue as of high importance to them. Depending on the cultural value and reproducibility of cultural heritage sites, receptors sensitivity can vary between low and high. Impact magnitude is large for physical deterioration and medium for changes of setting. Impacts significance is presented in *Table 15.25.*

The Project will develop a Cultural heritage management plan including guidelines for the implementation of the following mitigation and management measures to reduce the magnitude and thus significance of impacts from the proposed Project.

Avoidance of Cultural Heritage

The most effective method to reduce impacts to cultural heritage is through avoidance via Project redesign.

Field Investigation of Archaeological Anomalies

For those potential archaeological sites that cannot be avoided by construction activities, the Project should sponsor a systematic field investigation program. The purpose of the program would be to determine which if any of the anomalies are in fact archaeological sites and, for any that are, to determine their sensitivity. This field investigation should be directed by a professional archaeologist with experience in West African archaeology, supported by local specialists.

Archaeological Rescue (i.e., Data Recovery) Excavations

For any archaeological sites identified during the field investigation of potential archaeological sites that cannot be avoided by construction activities, the Project should sponsor archaeological rescue excavations prior to construction in the area of the sites. The purpose of these excavations would be to recovery as much data about the sites as possible before they are impacted by the Project. The excavations could target a select number of sites (e.g. high sensitivity sites) and should be directed by a professional archaeologist with experience in West African archaeology, supported by local specialists.

Cemetery Relocation

Cemeteries that will be directly impacted by ground disturbing activities should be relocated. Consultation with the community that uses the cemetery should take place in advance of any cemetery relocation. Cultural traditions should be respected, and it is likely that a local religious authority will need to be present during grave exhumation and re-interment. Relocation should be directed by local specialists with support from a professional archaeologist with West African experience.

Djinn (sacred site) Relocation

Relocation is a good option for mitigating impacts to *Djinn* locations, as the ritual process needed to move a *Djinn* is not uncommon in this part of West Africa. The process of moving a *Djinn* location usually involves the ritual relocation of the spirit to a new setting by a religious authority and should be preceded by local stakeholder engagement.

Cultural Heritage Stakeholder Engagement Program

The cultural heritage baseline field survey identified around 230 living cultural heritage resources within the proposed Project area. A stakeholder engagement program is recommended to seek the input of local communities regarding the implementation of mitigation measures to reduce impacts to these living cultural resources. The program would:

- work with local stakeholders in order to make recommendations for avoidance of these resources during the construction and operation phases of the Project; and
- where avoidance is deemed to be unfeasible, establish compensation measures including, but not limited to, *Djinn*/cemetery site relocation or archaeological rescue excavations to mitigate impacts to significant cultural heritage sites.

This focused stakeholder engagement program would be implemented prior to construction. The program would continue throughout the construction and operation phases to address stakeholder concerns as they arise.

Cultural Heritage Training of Workers

The Project will establish a Cultural Heritage Training Program for project management and for the construction contractor's management and field staff. The objective of the Cultural Heritage Training program is to manage potential impacts to known and unknown cultural heritage sites by facilitating the identification and reporting of potential Chance Finds encountered during construction activities. The program will consist of a lecture and classroom training, Chance Finds tool box talks/training for field staff, and the development of reference materials such as fliers, signage, and educational posters to be posted in construction camps and facilities. This training will be designed and delivered by an experienced international cultural heritage specialist and will cover:

- identifying Chance Finds in the field;
- local sensitivities to cultural heritage resources;
- sensitivity of cultural heritage sites to looting and legal penalties for looting or the degradation or removal of cultural heritage sites;
- chance Finds reporting procedures; and
- the consultation process with local and national stakeholders and regulatory agencies.

The presence of construction personnel with training in the identification and reporting of Chance Finds will limit the need for the monitoring of an on-site professional archaeologist to construction activities in the vicinity of known or suspected cultural heritage sites.

Development and Implementation of a Chance Finds Procedure

A Chance Finds Procedure is intended to provide responses and actions that should be implemented in the event of chance discovery of heritage resources. It is thereby intended to manage impacts to known, suspected, and unknown cultural heritage sites during construction activities. It defines the protocols and procedures for assessing unanticipated cultural heritage sites or materials encountered during construction activities.

It is also highly recommended:

- to make use of the services of specialists, international experts, and/or local persons authorized to conduct negotiations on potential displacements or disruptions of the CHe sites;
- to participate in the treatment of the reproducible sites (i.e. the preliminary consultations with the communities responsible and users of the sites in order to identify the sacrifices and the steps to be taken to allow either for the displacement or for the disruption of the site);
- to carry out a new census of the sites in the event the mining goes beyond the area selected for the initial inventory (after finalizing the mining plan);
- to implement a compensation system for all the on-site damage caused by the building sites within the framework of an RAP;

- to install protection infrastructure (barriers, fences, screen plantations, earthworks, etc.) where the communities ask for them;
- to systematically inform the subcontractors about the presence of heritage sites on their work places; and
- to supervise the work of the subcontractors when they have to work in an area where cultural heritage sites have been listed.

Both the significance and the sensitivity would reduce following the implementation of these mitigation measures. Indeed, these measures will allow for limiting the number of sites impacted and will improve the treatment of these sites. In parallel, the sensitivity of the population will be mitigated insofar as the traditions will be respected.

The information on the degree of ability to reproduce, displace or destroy a site is given as an indication in the database of CHe sites presented in the socioeconomic baseline study. This information must be systematically confirmed with the persons responsible for the sites concerned. The sites classed as the least important should be treated with as much precaution as the sites of high significance. Indeed, no site may be destroyed without taking the preliminary steps proposed in the mitigation measures hereinabove. The different forms of treating sites are presented in *Annex 14.1 Section 3.*

Table 15.25 Mine area - impacts of the project's physical footprint on cultural heritage during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Direct Impact to Cemeteries from Ground Disturbing Activities	*Major*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage, proposed mitigation measures and coordinate on relocations - Relocate cemeteries in coordination with local population in particular with regard to their preferences regarding relocation practices and locations - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Direct Impact to *Djinn* Locations from Ground Disturbing Activities	*Moderate*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage, proposed mitigation measures and coordinate on relocations - Relocate *Djinn* in coordination with local population in particular with regard to their preferences regarding relocation practices and locations - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Negligible*
Direct Impact to potential archaeological sites that are found NOT to be archaeological sites, or to be replicable (low sensitivity) archaeological sites	*Unknown (Minor to Major)*	- Investigate potential archaeological sites to confirm their importance - Develop and implement of a Chance Finds Procedure to ensure suspected or unknown sites are discovered on time and managed appropriately - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Direct Impact to Potential archaeological sites found to be archaeological sites that are critical (high sensitivity) or non-replicable (medium sensitivity)		- Investigate potential archaeological sites to confirm their importance - Avoid groundwork and construction on critical (high importance) cultural heritage sites - Avoid or excavate and preserve by recording non-replicable (medium importance) cultural heritage sites - Develop and implement of a Chance Finds Procedure to ensure suspected or unknown sites are discovered on time and managed appropriately - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*

Indirect Impact to the Cultural Setting of Cemeteries	*Moderate*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage and proposed mitigation measures - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Indirect Impact to the Cultural Setting of *Djinn Locations*	*Moderate*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage and proposed mitigation measures - Through stakeholder engagement, confirm the sensitivity of changes to *Djinns* cultural settings and assess the need for relocation - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Minor*
Impact to all categories of cultural resources through the increase of non-local workers	*Minor*	- Develop and implement a specific stakeholder engagement program to inform the population on Project potential impacts on cultural heritage and proposed mitigation measures - Provide training to workers on Cultural Heritage including site identification and sensitivities, local cultural practices and mitigating measures and procedures in place	*Negligible*

15.2.3.12 Impacts on living conditions and the landscape

Impacts and mitigation measures from noise & vibration and air-quality are described in *Chapter 8, Environmental Impact Assessment for Mine Activities* of this SEIA Addendum and will not be further described in this section. As mentioned in *Section 15.2.3.8, Impacts on health and safety, p*hysical impacts of major significance will be mitigated through resettlement of the receptors. This will allow for the suppression of most significant impacts to the population in terms of health, safety and wellbeing. The sections below discuss potential impacts on living conditions of non-resettled households from Project noise & vibration, dust and landscape modification.

Noise and vibrations

The operational activities of the Project could result in a significant increase in noise and vibrations. The movement of trucks on the haul roads and in the quarries, the blasting works or even the train traffic in the north-west part of the MA might thus result in high noise and vibration levels and affect the living conditions of the surrounding populations. It might further be the case that the vibrations caused by the blasting works induce damage on the traditional housing of the surrounding communities (cracks, landslides, etc.).

This impact will have a medium magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to adopt a traffic management plan that avoids displacements near residential areas;
- to provide the populations with information on the blasting works and carry out temporary evacuations if necessary;
- to consider all technical measures designed to reduce the noise and vibration levels (plantations, anti-noise walls, etc.);
- to put in place a control of the impacts on the village infrastructure with appropriate compensation measures in case of deteriorations observed following the blasting works;
- to use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis;
- to adapt the working hours in order to guarantee quiet periods, particularly at night (train traffic); and
- to aim at the compliance of the noise and vibration levels with the EHS Guidelines (IFC 2007) and adopt appropriate measures to limit them.

The implementation of these mitigation measures will result in a minor residual impact during the operational phase.

Dust

The movement of trucks on the haul roads and in the quarries, the mining of bauxite, the backfilling and clearing works and the blasting operations might all be factors that significantly increase the levels of dust during the operational phase. This dust will be transformed into mud in the rainy season which will further increase the prevalent muddy environment and may affect wellbeing of local populations (muddy tracks, run-offs of mud in the lowlands, etc.).

This impact will have a medium magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to adopt a traffic management plan that avoids traffic near residential areas;
- to consider measures designed to reduce the dust emission levels (water spraying on dust-generating surfaces, etc.); and
- to use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis.

The implementation of these mitigation measures will result in a minor residual impact during the construction phase. These measures will in fact allow for mitigating the source of the impact and for reducing the number of persons impacted. Thus, the significance of the impact will be reduced.

Landscape

The visual impacts might be major during the operational phase of the Project. The opening of haul roads and the mining of the bauxite plateaus might also cause the clearance of forested areas (gallery forests, plateau forest). The lighting of the work sites might also constitute a source of light pollution for the surrounding populations.

This impact will have a large magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be major.

The planned mitigation measures to mitigate the significance of this impact are:

- to provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed below and not at the residential areas); and

- to implement progressive rehabilitation and vegetation of the mine pits and waste emplacements as they are abandoned.

The implementation of these mitigation measures will result in a moderate residual impact during the operational phase.

Table 15.26 Mine area - impacts of the project's physical footprint on living conditions and landscape during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Noise and vibrations	*Moderate*	- To adopt a traffic management plan that avoids displacements near residential areas. - To provide the populations with information on the blasting works and carry out temporary evacuations if necessary. - To consider all technical measures designed to reduce the levels of noise and vibration (plantations, anti-noise walls, etc.). - To implement displacements and resettlements of the affected populations in case the inhabited areas are too near to the operating areas. - To put in place a control of the impacts on the village infrastructure with appropriate compensation measures in case of deteriorations observed following the blasting works. - To adapt the working hours in order to guarantee quiet periods, particularly at night (train traffic). - To aim at the compliance of the noise and vibration levels with the EHS Guidelines (IFC 2007) and adopt appropriate measures to limit them. - To use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis.	*Minor*
Dust	*Moderate*	- To adopt a traffic management plan that avoids traffic near residential areas. - To consider measures designed to reduce the dust emission levels (water spraying on dust-generating surfaces). - To implement displacements and resettlements of the affected populations in case the inhabited areas are too near to the Project mining activities. - To use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis.	*Minor*
Landscape	*Major*	- To implement progressive rehabilitation and vegetation of the mine pits and waste emplacements as they are developed.	*Moderate*

15.2.4 Closure phase

15.2.4.1 Sources of impact

The closure phase corresponds to the end of the mining of the bauxite plateaus.

The closure phase will involve the shutting down of the mining, which includes the end of blasting works and stopping the traffic of mining trucks that transport the ore to the crushing plant and the train loading area.

Pursuant to Article 144 of the Mining Code 2013 on the closure of mining sites, the Project will have to develop a closure plan of its operating site and open and contribute to a trust account for environmental rehabilitation.

The closure plan will include rehabilitation of the plateaus as a main overarching mitigation measure following steps described in *Section 14.5.*

Rehabilitation of last exploited pits will allow for re-vegetation and preparation of the land for agriculture, herding or natural resource collection, depending on communities expectations.

At final closure, Project' infrastructure will be decommissioned, including the buildings that will have been built in the residential camp and the crushing plant. It is also planned that this land is returned to the local communities following the same principles for the rehabilitation of the plateaus as described in *Section 14.6.*

15.2.4.2 Impact on demographics and social dynamics

Social tensions around land

When the mining on a plateau will have been completed a plateau, and upon the final closure of the Project and the end of the decommissioning of the infrastructure, the impacted communities will have the possibility of regaining access to their land. It should be considered that quite a considerable number of persons will not wish to return to their original land. However, some demobilized workers or resettled people could be tempted to return to their original settlements and resume farming and/or cattle herding activities. New social tensions might appear as to the status and rights on the returned land, the former inhabitants and users of land compensated might challenge their right to return to this land.

This impact will have a low magnitude during the closure phase but would have high sensitivity; therefore the significance of the impact will be medium.

The planned overarching mitigation measures as further detailed in *Section 14.6* are:

- to implement of a RAP in accordance with the principles of a LRRF in particular by clarifying the legal status and land rights on the land that will be returned to the communities before resettlements takes place; and
- to rehabilitate mining plateaus and the IA through revegetation for agriculture, herding or collection of natural resources in particular by collaborating closely with the traditional authorities when returning the land.

The implementation of these mitigation measures will help avoid tensions and disputes around the claim of land rights by the population and are expected to result in a minor residual impact.

Table 15.27 Mine area - impacts of the project's physical footprint on demographics and social dynamics during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Social tensions around land	*Moderate*	- To implement of a RAP in accordance with the principles of a LRRF in particular by clarifying the legal status and land rights on the land that will be returned to the communities before resettlements takes place. - To rehabilitate mining plateaus through revegetation for agriculture, herding or collection of natural resources in particular by collaborating closely with the traditional authorities when returning the land.	*Minor*

15.2.4.3 Impacts on local power, governance and civil society

Reinforcement of methods of traditional governance

The authority of the traditional power relies mostly on its control of the management of the collective land areas. This authority might therefore be reinforced by the return of the mined and infrastructure areas to the population.

This positive impact will have a low magnitude but would have high sensitivity; therefore the significance of the impact will be moderate.

The planned overarching mitigation measures as further detailed in *Section 14.5* and *Section 14.6* are:

- to implement of a RAP in accordance with the principles of a LRRF in particular by clarifying the legal status and land rights on the land that will be returned to the communities before resettlements takes place; and
- to rehabilitate mining plateaus and infrastructure areas through revegetation for agriculture, herding or collection of natural resources in particular by collaborating closely with the traditional authorities when returning the land.

The implementation of these mitigation measures will result in a major positive residual impact by ensuring local authorities are reinforced in their function of land management.

Table 15.28 Mine area – impacts of the project's physical footprint on powers, governance and civil society during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reinforcement of methods of traditional governance	*Moderate*	- To implement of a RAP in accordance with the principles of a LRRF in particular by clarifying the legal status and land rights on the land that will be returned to the communities before resettlements takes place; and - To rehabilitate mining plateaus and infrastructure areas through revegetation for agriculture, herding or collection of natural resources in particular by collaborating closely with the traditional authorities when returning the land.	*Major*

15.2.4.4 Impacts on the land

Increase in land availability

At the time of the final closure the return of the land to the local communities of all the mined plateaus and infrastructure areas should significantly increase the availability of the land resource for the local communities which in the meanwhile should have access to other land through the resettlement process.

This impact will have a large magnitude, since wide areas will be returned and receptors would have a high sensitivity, therefore the significance of the impact will be major.

The impact is expected to be optimized through the diligent implementation of the measures foreseen by the land rehabilitation process described in *Section 14.6*.

The significance of the impact will remain major with the implementation of the improvement measures.

Table 15.29 Mine area -impacts of the project's physical footprint on land tenure during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in land availability	*Major*	- To rehabilitate mining plateaus and infrastructure areas through revegetation for agriculture, herding or collection of natural resources, depending on stakeholders expectations.	*Major*

15.2.4.5 Impacts on agriculture and cattle herding

Increase in cattle herding and farming

The return of the mined land to the local communities will enable them to progressively resume the activities performed on this land before mining, and particularly the most important activities in terms of subsistence, namely farming and cattle herding.

However, the reclaimed land is unlikely to allow the economically resettled people to restore their land to its initial condition or use. Restoring the fertility of the deteriorated soil is a long and complicated process.

This impact will have a low magnitude, since the number of impacted people is limited but would have high sensitivity; therefore the significance of the impact will be moderate.

The impact is expected to be optimized through the diligent implementation of the measures to restore land quality foreseen by the land rehabilitation process described in *Section 3.2.9.1*.

The implementation of these improvement measures will result in a major residual impact.

Improvement of food security

The restoration of agricultural activities and cattle herding should be accompanied by a progressive increase in the production, and therefore improved food security conditions for households.

This impact will have a large magnitude and receptors have high sensitivity. The significance of the impact will therefore be major.

The impact is expected to be optimized through the diligent implementation of the measures to restore land quality foreseen by the land rehabilitation process.

The significance of the impact will remain major with the implementation of the improvement measures.

Decrease in conflicts between farmers and cattle herders

The progressive return of the land to the local communities should allow for significantly reducing the pressure on the land resource and reduce the climate of competition on the land between farmers and cattle herders.

This impact will have a low magnitude and receptors have high sensitivity. The significance of the impact will therefore be moderate.

The planned improvement measures to optimize the significance of this impact are:

- re-qualification of certain haul roads as transhumance routes; and
- implementation of the measures foreseen by the land rehabilitation process, in particular through the segmentation of reclaimed spaces between crop-growing, cattle herding and forest ecosystems following community expectations.

The implementation of these improvement measures will result in a major residual impact.

Table 15.30 Mine area - impacts of the project's physical footprint on agriculture and cattle herding during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in cattle herding and farming	*Moderate*	- To rehabilitate mining plateaus and infrastructure areas through restoration of arable land quality and revegetation for agriculture, herding or collection of natural resources, depending on stakeholders expectations.	*Major*
Improvement of food security	*Major*	- To rehabilitate mining plateaus and infrastructure areas through restoration of arable land quality and revegetation for agriculture, herding or collection of natural resources, depending on stakeholders expectations.	*Major*
Decrease in conflicts between farmers and cattle herders	*Moderate*	- To re-qualify certain haul roads as nomadic cattle migration routes. - To implement the measures foreseen by the land rehabilitation process in particular through the segmentation of reclaimed spaces between crop-growing, cattle herding and forest ecosystems following community expectations.	*Major*

15.2.4.6 Impacts on access conditions to natural resources

Improved access to natural resources

The removal of the mining trucks and vehicles from the area and the free access to the haul roads should considerably reduce hindrances to movement in the MA. The populations to which the land would be returned will benefit from better access to the natural resources mainly in the areas that have been preserved and / or reclaimed.

In the areas in which mining lasted for several years, rehabilitation of land will allow for natural resources settle and grow. In several places, years, or even decades will allow for a gradual improvement of the quantity and quality of the natural resources to a level comparable to the one before the Project.

This impact will have a low magnitude, since it will take time before quantity and quality of the natural resources really improves, and receptors have high sensitivity. The significance of the impact will therefore be moderate.

Improvement measures in order to optimize the significance of this impact are:

- to maintain at the end of the operational phase the haul roads that could present advantages in terms of access to the untouched natural resources for the local populations ; and
- to implement the measures foreseen by the land rehabilitation process in particular to restore land quality and revegetate the area.

The implementation of these improvement measures will result in a major residual impact during the closure phase.

Table 15.31 Mine area - impacts of the project's physical footprint on access to natural resources during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improved access to natural resources	*Moderate*	- To maintain at the end of the operational phase the haul roads that could present advantages in terms of access to the untouched natural resources for the local populations. - To implement the measures foreseen by the land rehabilitation process in particular to restore land quality and revegetate the area.	*Major*

15.2.4.7 Impacts on the local socioeconomic context

Improvement of income

The rehabilitation and the progressive regeneration of economic opportunities offered by the environment in terms of increased availability of land, agricultural and herding output and access to natural resources (*cf* impacts above) should contribute towards significantly improving the income of households in the area.

Further, the removal of the mining trucks and vehicles from the area and the free access to the haul roads should considerably reduce hindrances to movement in the MA. The possibility of commercial outlets should therefore significantly improve, with easy access to the markets and above all the possibility for the collectors to go to the production areas to buy the different local produce there ("farm gate" selling).

This indirect impact will have a medium magnitude during the rehabilitation and closure phase, and its receptor a high sensitivity. The significance of the impact will therefore be major.

The planned main improvement measure in order to optimize the significance of this impact consists of maintaining at the end of the operational phase the haul roads that could present advantages in terms of mobility for the local populations.

The significance of the impact will remain major with the implementation of the improvement measure.

Table 15.32 Mine area - impacts of the project's physical footprint on local socioeconomic context during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of income	*Major*	- To maintain at the end of the operational phase the haul roads that could present advantages in terms of mobility for the local populations.	*Major*

15.2.4.8 Impacts on health and safety

Reduction in diseases related to the mining activity

The closure of the mining activities should lead to a reduction in diseases related to air pollution, noise pollution and even diseases related to water and sanitation. Several factors explain this:

- reduced risk of industrial accidents and discharges of industrial effluents (including fuel) in the natural habitat;
- reduction in sources of emission of dust (truck traffic, ore crushing, scouring and blasting of the plateaus);
- reduction in noise and vibration levels associated with the mining activities (movement of trucks and trains, blasting operations); and
- improved health facilities and access to then through the Local development Plan.

This impact will have a medium magnitude during the closure phase, and its receptor a high sensitivity. The significance of the impact will therefore be major.

The impact is expected to be optimized through the diligent implementation of the measures foreseen by the decommissioning of the mine infrastructure, in particular by the maintenance of a run-off water draining system, the evacuation of chemicals, the decommissioning of tanks and the decontamination of soil where applicable.

The significance of the impact will remain major with the implementation of the improvement measures.

Reduction in road and railway insecurity

The closure phase of the Project should coincide with a significant improvement in road and railway safety in the MA due to the reduced movement of the Project's trucks and vehicles and the stop of the train traffic within the framework of the mining activities.

This impact will have a low magnitude since the number of concerned people is limited, and medium sensitivity. The significance of the impact will therefore be minor.

The planned improvement measures to optimize the significance of this impact are:

- to maintain a road safety code in the area (speed limits, sign boards, etc.); and
- to continue the campaigns to raise the awareness of the population on road safety issues.

The implementation of these improvement measures will result in a moderate residual impact during the closure phase. These measures will allow for maximizing the positive consequences for the majority of the population.

Safety risks related to the stopping of activities

The sites at the end of the mining (abandoned quarries) might become potentially dangerous sites for the populations living nearby (risk of slides and run-offs). Likewise, some of the Project's infrastructure could represent a danger for the surrounding populations (presence of hazardous materials, projecting metallic elements, etc.).

This impact will have a medium magnitude, since the number of exposed people is limited, and receptors have a medium sensitivity. The significance of the impact will therefore be moderate.

The impact is expected to be optimized through the diligent implementation of the measures foreseen by the decommissioning of the mine infrastructure, in particular by ensuring the physical stability (risk of landslides) of the former mining sites, the evacuation of chemicals, the decommissioning of tanks and the decontamination of soil where applicable.

The implementation of these mitigation measures will result in a minor residual impact during the closure phase.

Table 15.33 Mine area - impacts of the project's physical footprint on health and safety during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduction in diseases related to the mining activity	*Major*	- To implement the measures foreseen by the decommissioning of the mine infrastructure, in particular by the maintenance of a run-off water draining system, the evacuation of chemicals, the decommissioning of tanks and the decontamination of soil where applicable. - Improve health facilities and access to then through the Local development Plan.	*Major*
Reduction in road and railway insecurity	*Minor*	- To maintain a highway code in the area (speed limits, sign boards, etc.). - To continue the campaigns to raise the awareness of the population on road safety issues.	*Moderate*
Safety risks related to the stopping of activities	*Moderate*	- To implement the measures foreseen by the decommissioning of the mine infrastructure, in particular by ensuring the physical stability (risk of landslides) of the former mining sites, the evacuation of chemicals, the decommissioning of tanks and the decontamination of soil where applicable.	*Minor*

15.2.4.9 Impact on education

Improvement of the access to education infrastructure

Impacts with respect to the Project's physical footprint and related to education in the closure phase could be the significant improvement of access to education infrastructure due to the improvement in mobility and the increased investments during construction and operation from the LDP and RAPs as mitigation to the Project footprint impacts. These impacts should remain provided that such infrastructures are maintained despite the end of the Project's activities. This subject is developed in the following *Section 15.2.4.10*Impact on mobility, flows and transport.

15.2.4.10 Impact on mobility, flows and transport

Improvement of traffic conditions

The only heavy vehicles that will probably continue to operate will be those related to the potential decommissioning, closure and reclamation activities of the sites, but it will be for a limited time. The mining trains should no longer operate. We should therefore see a significant reduction in transport flows in the area. Further, the progressive opening of the haul roads for use by the local population should improve access in the area. Access for the local population to the healthcare and education services and even to markets should be considerably improved.

This impact will have a medium magnitude, since it is expected that the impact on mobility and educational infrastructure may fade with time after the Project closure, and medium sensitivity. The significance of the impact will therefore be moderate.

The foreseeable improvement measures are:

- to maintain the haul roads that could present advantages in terms of mobility for the local populations; and
- to collaborate ahead of the closure of the Project with the local authorities to ensure ongoing maintenance of the tracks for use by the local population.

The significance of the impact will become major with the implementation of these improvement measures.

Table 15.34 Mine area - Impact of the project's physical footprint on mobility, flows and transport during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of traffic conditions	*Moderate*	- To maintain the haul roads that could present advantages in terms of mobility for the local populations. - To collaborate ahead of the closure of the Project with the local authorities to ensure maintenance of the tracks for use by the local population.	*Major*

15.2.4.11 Impacts on cultural heritage

The impact on the cultural heritage will be negligible, as the Project's activities during the closure phase will take place in areas having already been managed during operations.

15.2.4.12 Impacts on living conditions and the landscape

Improvement of living conditions and the landscape

During the closure phase, the impacts on living conditions and the landscape should be positive. The decommissioning of some infrastructure and the end of the activities may allow the communities to enjoy a less noisy environment. The levels of dust will reduce with the stop of the movement of trucks and of the scouring and blasting operations of the plateaus. Moreover, the progressive deterioration of the landscapes as the plateaus are mined will be interrupted. The change to the landscape from mined plateaus of lower altitude and haul roads will however remain.

This impact will have a low magnitude and medium sensitivity. The significance of the impact will therefore be minor.

The planned improvement measures to optimize the significance of this impact are to implement the measures foreseen by the closure and rehabilitation process, in particular by:

- decommissioning systematically the Project's infrastructure and installations apart from those that would be of interest for the surrounding communities;
- re-contouring and re-grading the pit surfaces to ensure a soft transition with the surrounding landscape in terms of topography; and
- revegetation of plateaus and haul roads, apart from those that would be of interest for the surrounding communities.

The implementation of these improvement measures will result in a moderate residual impact during the closure phase. These measures will allow for maximizing the positive impact of the closure phase on the living conditions and landscape, and will allow a higher number of people to benefit from this.

Table 15.35 Mine area - impacts of the project's physical footprint on living conditions and landscape during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of living conditions and the landscape	*Minor*	- To implement the measures foreseen by the closure and rehabilitation process, in particular by : • decommissioning systematically the Project's infrastructure and installations apart from those that would be of interest for the surrounding communities; • re-contouring and re-grading the pit surfaces to ensure a soft transition with the surrounding landscape in terms of topography; and • revegetation of plateaus and haul roads, apart from those that would be of interest for the surrounding communities.	*Moderate*

15.3 SOCIOECONOMIC IMPACTS

15.3.1 Introduction

This part specifically deals with impacts related to the Project's direct contribution to the development of the local economy during the different activities' phases and the changes in the socioeconomic dynamic it induces - creation of jobs, migration flows, increase in budgets dedicated to local development.

Overarching social mitigation measures used to mitigate or optimize potential social impacts from the Project are described in *Section 14.5* above. These measures are:

- Resettlement and livelihood restoration;
- Stakeholder Engagement;
- Grievance Procedure;
- Local Development Plan;
- Code of business conduct;
- Influx management; and
- Closure and rehabilitation.

These measures are applicable to most social impacts arising from the Project and therefore will not be further developed for each of the impacts assessed below although they participate in their attenuation. Wherever these measures are considered relevant to mitigate impacts they will be mentioned in the overview table of each Project residual impact.

15.3.2 Construction phase

15.3.2.1 Sources of impact

The direct sources of impact during the construction phase are the following:

- creation of direct jobs by the Project to meet its labor requirements in an area in which formal jobs are limited;
- creation of indirect jobs by the Project's subcontractors;
- creation of induced jobs related to the Project's needs and general increase in consumption of goods and services; and
- increase in public revenue related to the payment of the taxes paid by the Project to local and national authorities.

GAC plans to employ on average between 800 and 1000 workers during the construction phase of the mining infrastructure and the railway apron, with a peak of 1,000 jobs during the most intense period of the construction activities. A lot of these jobs will be temporary jobs. These will mainly be unskilled and semi-qualified jobs.

Concerning indirect and induced jobs, for each direct job created during the construction phase, approximately 2 to 3 other jobs will be indirectly created in

Guinea, therefore participating in the creation of 2,000 to 3000additional jobs in the economy in general.

15.3.2.2 Migration flows and development of land management methods

Migration flows

At the start of the construction activities, information on hiring of workers will be published throughout Guinea, and even in the sub-region. This may trigger a rapid influx of job seekers in the Project's area. These will tend to settle near the camp and future GAC infrastructure (Tinguilinta and settlements of the RA, particularly those near the future crushing plant of the Project such as Boundou Lengué). As an example, the settlement of Tinguilinta, located near the mining camp, has seen its annual population grow by about 20% in the 10 years following the start-up of the Project in 2004, whereas population growth is approximately of 3% in the entire MA. The IFC Handbook for addressing Project-induced in-migration remarks that, within the framework of the extractive industry's projects in Asia and Africa, the population growth induced by the migration flow was around 10% to 15% per annum[1].

Consequently, the communities located near the future infrastructure and the numerous settlements of the RA, particularly Tinguilinta, will be affected by the impacts related to the migration flows generated by the creation of jobs (social tensions, health risks, etc.). When an impact concerns this area specifically, it is generally negligible for the IA.

Development of land management methods

In the MA, the land is usually managed at lineage or settlement level by traditional authorities. It is foreseeable that the arrival of non-local migrants not owning land will result in an increase in monetary land transactions and, hence, a phenomenon of individualization of land ownership and use. This phenomenon will probably mainly arise on the land of the communities of the RA, near to Tinguilinta and the Project's infrastructure. The scarcity of usable land might favor an ever-increasing division of plots and a speculative phenomenon both on the plots of land and on the housing. In the IA, the development of a market for land is possible as arable land might be sold by certain individuals who would take advantage of its scarcity in order to cash in on their ancestral rights of access to the land.

The indirect, negative and positive, impacts of these two direct impacts are categorized and described below.

(1) International Finance Corporation (2009) *"Projects and People: A Handbook for Addressing Project-Induced In-Migration"*, available on http://www.ifc.org/wps/wcm/connect/f12c2800488555b3b7c4f76a6515bb18/Influx_Full.pdf?MOD=AJPERES

15.3.2.3 Impacts on demographics and social dynamics

Change in the traditional family structure

The traditional family structure of the MA is organized around the head of the family and young men, who are responsible for the production of the resources required for the survival of the entire household (women, elderly, and children).

When the construction phase starts, it is likely that a lot of young men will migrate in search for a job with the company or its subcontractors. The women would then become responsible for the subsistence of the members of the household who remained in the settlement. Further, the inter-generational solidarity mechanisms, in which the elderly, after having looked after their elders, their spouses and their children, throughout their life, are in turn in charge of the youngest, could disintegrate. These solidarity mechanisms, which also allow for providing support to the most vulnerable (widows, handicapped, orphans, etc.) would suffer from the departure of the young men, the main generators of means of subsistence. Young men directly or indirectly employed by the Project will most probably send remittances to their family thereby transforming traditional reciprocity relationships into financial support.

The creation of jobs will also attract people outside the territories of the GAC concession. These may be persons foreign to the area, but also individuals or families returning in the hope of being able to find a job with the Project. Only some of these people will be able to be employed, given the limited labor requirements of the Project. The persons not employed might find themselves without resources. Their burden would then fall on their host community and the hosting communities may negatively react to this increased pressure on their own market.

The change in the traditional family structure might have a medium magnitude, since it will not affect all families, and is associated with high sensitivity of the receptors. Its significance is therefore considered major.

The following overarching mitigation measures described in *Section 15.2.2.2* will be implemented to mitigate the impact:

- ensure local preferential hiring is implemented so as to benefit to the Project resettled people and local communities in priority; and
- implement and fund development projects as part of the Local Development Plan in order to reinforce or create income generating activities especially those performed by women.

The residual impact is expected to be moderate insofar as the activities representing an alternative source of income could contribute to maintaining the traditional family balance.

Pressure on persons benefiting from a salaried job

People recruited by GAC or by one of its subcontractors might suffer strong social and economic pressure. These people might in fact be responsible for their entire household, or even their extended family or their community. This impact will be accentuated by the population growth in the families and settlements related to the migrations caused by the job opportunities (see *Section 15.3.2.3, Change in the traditional family structure*) and by the fall in income related to the loss of resource spaces (see *Section 15.2.2.7, Decrease in income*).

This impact will have a medium magnitude and their receptors a medium sensitivity. Its significance is therefore considered moderate.

In order to mitigate this impact, the Project will implement and fund development projects as part of the Local Development Plan with the objective to enhance economic opportunities and living conditions in the MA, in particular by:

- supporting income-generating activities for women(e.g. market garden activities, palm oil production, dyeing, etc.) and men (e.g. farming, herding, joinery, mechanics, etc.) through the provision of training, materials, funding, etc.; and
- to fund community development projects to enhance public infrastructure and services.

The implementation of these mitigation measures will result in a moderate residual impact.

Increase in social tensions and conflicts

The migration flows caused by the appeal of the opening of salaried jobs by the Project could be the source of social tensions and conflicts, mainly crystallized around access to jobs. The recruitment of non-local migrants rather than locals could appear unfair to the people potentially impacted by the Project. This might lead to more or less hostile reactions towards the non-local workers and towards the Project.

Likewise, families, settlements and even districts in which no individual has been recruited could become hostile towards the other families, settlements, or districts, and also to the Project.

Most of the migrants attracted by the opportunities offered by the Project will be comprised of single men. The increase in the number of these "single" households could be linked to an increase in risky practices (consumption of drugs, prostitution). The inflow of single men in the area could also be the cause of changes to the family structures, with some people preferring to settle with salaried employees of the Project.

The social tensions and conflicts will probably be concentrated in the communities closest to the Project's infrastructure: Tinguilinta and the settlements of the RA close to the future infrastructure.

Finally, tensions could arise towards the Project if this does not offer equal treatment to what has been given in the north area since 2004 (see *Section 15.1.6 Local economic context (mining industry, commerce and services)*).

In the RA, the magnitude of this impact is considered medium, receptors sensitivity high, and its significance is therefore evaluated as major. It is expected to be negligible, in the construction period, in the rest of the IA.

The following overarching mitigation measures mentioned in *Section 14.5* will be implemented to mitigate the impact:

- ensure local preferential hiring is implemented so as to benefit to the Project resettled people and local communities in priority; and
- implement and fund development projects as part of the Local Development Plan in order to reinforce or create income generating activities especially those performed by women and enhance public infrastructure and services benefiting to all.

The implementation of these mitigation measures will result in a moderate residual impact.

Table 15.36 Mine area - impacts of the project's local content on demographics and social dynamics during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Change in the traditional family structure	*Major*	- Ensure local preferential hiring is implemented so as to benefit to the Project resettled people and local communities in priority. - Implement and fund development projects as part of the Local Development Plan with the objective to enhance economic opportunities and living conditions in the MA, in particular by : • supporting income-generating activities for women(e.g. market garden activities, palm oil production, dyeing, etc.) and men (e.g. farming, herding, joinery, mechanics, etc.) through the provision of training, materials, funding, etc.; and • to fund community development projects to enhance public infrastructure and services.	*Moderate*
Pressure on persons benefiting from a salaried job	*Moderate*		*Moderate*
Increase in social tensions and conflicts in the MA	*Major*		*Moderate*

15.3.2.4 Impacts on powers, governance and civil society

Weakening of methods of traditional governance

The migrants arriving in the MA in search of jobs do not necessarily subscribe to the local traditional governance system.

Furthermore, the young locals who have found a job (particularly a qualified one) could affect the solidity of these systems. They might tend to become the main spokespeople of the Project in their villages.

The weakening of the traditional powers will be accentuated by the land management issues. The arrival of migrants might result in a phenomenon of monetization of the land, with these buying plots usually inherited within a lineage and/or a settlement. Thus, the administration and management rights on these plots, initially supervised by the traditional authorities, would become individualized in favor of non-local people.

The traditional authorities might also see their responsibilities in terms of conflict management weaken. First of all, the land conflicts related to land that would have been sold would then be managed no longer by the traditional authorities but by the administrative authorities. Furthermore, a lot of interpersonal and professional conflicts usually managed by the traditional authorities might now be managed by the Project and by the administrative authorities. This weakening of authority would probably lead to frustrations among the representatives of the traditional authority.

The magnitude of this impact is considered low, since it will not affect all people in the MA and will not radically upset traditional governance methods. However, receptors sensitivity is high. The impact therefore has a moderate significance.

The implementation of a RAP and the development of a Local Development Plan as detailed in *Section 14.6* in close collaboration with local traditional authorities is expected to mitigate the significance of this impact as it should reinforce their authoritative status and legitimacy.

The implementation of these mitigation measures will result in a moderate residual impact.

Reinforcement of civil society around intellectuals and workers

We can expect a reinforcement of civil society in the settlements in the entire MA. Already, in the district of Wossou an "*Awareness-raising campaigns' and defense of community socioeconomic rights' committee*" was created when the Project's subcontractors demarcated the quarries. The authorities and the settlement populations intend to relaunch the activities of their committee upon the start-up of the Project's construction activities. The main fears and expectations of the settlements of Wossou, Barkéré, Bouloye Gabo, Kéwi, were

listed by the members of this committee, and confirmed by the settlements' populations during the consultations.

Other NGOs and national and regional professional associations (mainly based in Sangarédi) might offer their services to carry out information, awareness-raising and development campaigns in social areas (healthcare, education, etc.).

Furthermore, the persons benefiting from measures implemented by the Project to support the local population might see a reinforcement of their general competencies:

- the workers might benefit from a reinforcement of their professional skills; and
- access to general education and professional training might be reinforced due to the increase in income of the population and of the administration, and due to the development support actions that may be considered by GAC.

This capacity-building would enable people to access knowledge of their rights and governance mechanisms.

The magnitude of this positive impact is considered low during the construction phase since it will concern only a limited number of people in that phase, and its receptors sensitivity medium. Its significance is therefore minor.

The following overarching mitigation measures described in *Section 14.5* will be implemented to mitigate the impact:

- implement and fund development projects as part of the Local Development Plan with the objective to improve access and quality of education in the area; and
- engage regularly with the associations and organizations of citizens as part of the Project Stakeholder Engagement Plan.

The implementation of these mitigation measures will result in a moderate residual impact.

Increase in the risk of poor financial management and tensions between communities and local administrative authorities

The Project will contribute to the local development budget of the communities as part of the Local Development Fund. The financial amounts managed by the local authorities will increase through the Project's regulatory contributions to the budgets of the local authorities, increasing the expectations of the various stakeholders. In the absence of a strong local culture of good budgetary management and transparency, it is feared that poor financial management practices and fund misappropriation might develop.

In addition, whether or not funds are poorly managed, it can be expected that the local authorities will be accused of bad management of the funds dedicated to development if the communities feel that they are not sufficiently benefiting from them.

The sub-prefectoral authorities (Sangarédi and Tanéné) and the communal authorities, located in the urban centers, might be regularly engaged to handle the main conflicts between the population and GAC. In this respect, these authorities fear being accused by the populations of defending the Project's interests rather than those of their citizens. This was expressed during consultations with the area's administrative authorities.

These tensions could be mitigated by the fact that civil society has been reinforced by Guinean intellectuals. Hence, having better knowledge of their rights, the communities will express more claims.

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a moderate significance.

The mitigation measures to avoid poor financial management and/or tensions between communities and authorities are the following:

- to apply a principle of transparency on the contributions paid by the Project to communities Local Development Fund and financing of development activities using GAC's own funds;
- to support the local authorities in their financial management and communications related to expenses for the local development;
- to involve the sub-prefectural, communal and district authorities in identifying and implementing development projects (particularly the basic infrastructure) supported by GAC using own funds;
- to establish a framework of collaboration with regular meetings (sub-prefectural, communal and district authorities, GAC and representatives of the subcontracting companies);
- to participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes; and
- to put in place an effective and transparent grievance mechanism.

The significance of the residual impact after mitigation measures is considered moderate.

Table 15.37 Mine area - impacts of the project's local content on powers, governance and civil society during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Weakening of methods of traditional governance	*Moderate*	- To implement a RAP and a Local Development Plan as detailed in *Section 14.6* in close collaboration with local traditional authorities in order to reinforce their authoritative status and legitimacy.	*Minor*
Reinforcement of civil society around intellectuals and workers	*Minor*	- To implement and fund development projects as part of the Local Development Plan with the objective to improve access and quality of education in the area. - To engage regularly with the associations and organizations of citizens as part of the Project Stakeholder Engagement Plan.	*Moderate*
Increase in the risk of poor financial management and tensions between communities and local administrative authorities.	*Major*	- To apply a principle of transparency on the contributions paid by the Project to the Local Development Fund and financing of development activities using GAC's own funds. - To support the local authorities in their financial management and communications related to expenses for the local development. - To involve the sub-prefectural, communal and district authorities in identifying and implementing development projects (particularly the basic infrastructure) supported by GAC using own funds; - To establish a framework of collaboration with regular meetings (sub-prefectural, communal and district authorities, GAC and representatives of the subcontracting companies). - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes. - To use an effective and transparent grievance mechanism.	*Moderate*

15.3.2.5 Impacts on land availability

Accentuation of inequalities of access to land resources

The arrival of migrants could lead to a phenomenon of cashing in on land, individualization of management and administrations rights and increased land pressure. Indeed, the number of land transactions could increase, particularly in the settlements of the RA and near Tinguilinta, whereas up to present day, land governance fell within the remit of traditional mechanisms. The increase in the number of land transactions is likely to result in inflation in the value of land in case of sale decided by the community, and therefore inequality in access to land resources insofar as some people would then no longer have the financial means to access the land. During the construction phase, the impact will be negligible in the IA.

The magnitude of this impact is considered medium in the RA and its receptors sensitivity medium. The significance is therefore moderate.

The support of Local Authorities in the development of an Influx Management Plan as an overarching mitigation measures is expected to mitigate this impact, in particular by:

- supporting local authorities in urban planning and development in larger centers to accommodate in-migrants, in complement with planning for Project employee housing and infrastructure; and
- supporting development of village zoning plans for settlements at high risk from in-migration, to direct in-migrant related development to defined areas where impacts will be minimized and to encourage local people to remain in their villages.

The significance of the residual impact after the implementation of this mitigation measure is considered minor.

Table 15.38 Mine area - impacts of the project's local content on land tenure during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in inequalities of access to land resources in the Road Area (including Tinguilinta)	*Moderate*	The support of Local Authorities in the development of an Influx Management Plan as an overarching mitigation measures is expected to mitigate this impact, in particular by: - supporting local authorities in urban planning and development in larger centers to accommodate in-migrants, in complement with planning for Project employee housing and infrastructure; and - supporting development of village zoning plans for settlements at high risk from in-migration, to direct in-migrant related development to defined areas where impacts will be minimized and to encourage local people to remain in their villages.	*Minor*

15.3.2.6 Impacts on agriculture and cattle herding

Increase in the cost of farm labor

Throughout the MA, some communities will probably have to make use of external farm labor insofar as a lot of young people are likely to leave rural works behind in the hope of finding a job with the Project. The collective land working and mutual farming aid dynamics could erode in favor of a process of individualizing the work.

The increase in requirements for farm laborers without a parallel increase in supply could result in inflation of the costs of this service. Consequently, the communities concerned would have to dedicate a larger percentage of their income to it and would become poorer.

This impact will have a medium magnitude and medium sensitivity. Its significance would therefore be considered moderate.

The following overarching mitigation measures described in *Section 14.5* will be implemented to mitigate the impact:

- ensure local preferential hiring is implemented in particular through the wide communication available jobs, required skills and hiring procedures in order to avoid that young people abandon their land in an unfruitful search for work; and
- implement and fund development projects as part of the Local Development Plan in order to improve agricultural productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.) resulting in a reinforced attractiveness of agriculture compared to uncertain jobs at the mine.

The significance of the residual impact after mitigation measures are applied is considered minor.

Table 15.39 Mine area - impacts of the project's local content on agriculture and cattle herding during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in the cost of farm labor	*Moderate*	- Ensure local preferential hiring is implemented in particular through the wide communication available jobs, required skills and hiring procedures. - Implement and fund development projects as part of the Local Development Plan in order to improve agricultural productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.).	*Minor*

15.3.2.7 Impacts on the local socioeconomic context

Improvement in the economic situation of recruited persons and of their households

The persons of the MA recruited by the Project and its subcontractors will benefit from stable monthly income. They will no longer be exposed to economic uncertainties related to the agricultural activities. Their access to basic services would also be facilitated by their increased disposable income.

However, a lot of jobs will be relatively temporary. Construction activities generate indirect and short to medium term jobs. Further, jobs with the subcontractors could be associated with less advantageous conditions for the employees (compliance with work standards, level of salaries, social welfare, etc.)

Consequently, the impact will have a low magnitude but very high sensitivity. Its significance would therefore be moderate.

In order to reinforce this impact, the Project will need to ensure that an Employment conditions and awareness management plan is developed and includes but not limited to:

- a description of the working conditions and terms of employment;
- consideration for collective agreements and respect of the workers' right to organize and bargain collectively;
- a workers accommodation quality and management policy;
- a retrenchment plan;
- a workers grievance process;
- a stated policy against forced and harmful child labor;
- provision of a safe and healthy work environment; and
- a workers awareness program including ways and plan to disseminate information to workers on their rights by the means of training or communication campaigns.

The Plan will specify where it is fully applicable to subcontractors in accordance with IFC PS 2 and AfDB OS 5 and the Project will ensure it is respected by contractors through contracts and regular auditing. It will also implement commercially reasonable efforts to require suppliers and other intermediaries to apply the applicable requirements of PS2 2 and AfDB OS 5 in conducting their businesses, including addressing child labor and forced labor in the supply chain.

The significance of the residual impact after mitigation measures are applied is considered to remain moderate.

Increase in economic inequalities between households

Households with one member who has been recruited by the company or one of its subcontractors will see their economic situation improve whereas households where no member has been recruited would be potentially exposed

to a deterioration in their economic situation (see Section *15.2.2.7*, *Decrease in income*) due to the impacts of the Project on the agricultural activities and the probable phenomenon of price inflation generated by the increase in local demand with the arrival of migrants.

In parallel, the migrants who arrived in the hope of getting a salaried job might find themselves unemployed without being able to rely on the traditional mutual aid structures (particularly family ones). Likewise, people who leave behind the traditional activities in the hope of finding a salaried job but not succeeding could find themselves in a precarious situation.

The impact is considered of medium magnitude and of high sensitivity. The significance is therefore major.

The following overarching mitigation measures mentioned in *Section 14.5* will be implemented to mitigate the impact:

- ensure local preferential hiring is continuously implemented so as to benefit to the Project resettled people and local communities in order of priority; and
- implement and fund development projects as part of the Local Development Plan described in *Section 14.6* with the objective to enhance economic opportunities and living conditions in the MA, in particular by supporting the creation of income-generating activities, agriculture and herding and capacity building in alternative professions.

The implementation of these mitigation measures will result in a moderate residual impact insofar as they will benefit to people not yet employed by the Project.

Figure 15.8 Motel site awaiting the resumption of the project and tele-centre, Tinguilinta



Increase in outlets for local produce, diversification of economic opportunities and reinforcement of local entrepreneurship

As of the construction phase, the arrival of migrants in search of jobs, and the presence of numerous employees of the Project may stimulate the development of the commerce and services sectors. This phenomenon will be accentuated by the increase in the purchasing power of the households having benefited from recruitment by the Project. It will mainly affect Tinguilinta and the settlements of the RA but will probably be negligible in the settlements of the IA.

For example, the settlement of Tinguilinta has considerably changed in the last 10 years (*see Chapter 12, Social baseline study*): previously mainly focused on agriculture, in the last decade the commerce and services sectors have developed. These changes should pick up in all the settlements on the edge of the RA.

Local entrepreneurship might have to develop to respond to this increase in requirements.

The requirements related to the Project (supply of materials, equipment, fresh produce, maintenance, security and construction services, etc.) might create outlets for the local or Guinean entrepreneurs:

- Some specialized equipment procurement contracts will only be accessible to a small number of specialized companies in Guinea, or even international companies, given the specialization of the requirements, the volumes concerned or even the quality and safety standards required.

- The smallest companies may however position themselves to receive some of the procurement contracts at local, regional and national level - this will concern for example civil engineering, food supplies, the non-technical maintenance services, the security services. This impact will be limited in the IA where the economic diversification and the capacity of service provider companies remain limited.

The magnitude of this impact is considered low and its receptors sensitivity medium. Its significance is therefore minor.

To optimize this impact, the Project will ensure local preferential sourcing is implemented so as to benefit to local entrepreneurs and businesses at local, regional and national level, including through a capacity building program aiming at building local business competencies to meet the Project standards including quality, health and safety requirements.

The residual impact could be moderate insofar as the local companies should benefit from more outlets.

Professional capacity-building in a globalized context

The direct and indirect jobs at the mine will allow people to improve their skills and their professional experience, through continuous training but also through one-off training on subjects such as the health, safety and environment standards. Working for the Project will also enable them to familiarize themselves with the working methods and requirements of a multinational company, help them to build their competitive capacities and their employability over the long term.

The magnitude of this impact is considered low insofar as few people will be concerned. Its sensitivity is considered medium. Its significance is therefore minor.

In order to reinforce this impact the Project will ensure employees are continuously trained on a series of topics including:

- training related to the delivery of the work specific to each workstation ;
- task-specific training for each new job assignment;
- knowledge of risks associated with work and applicable health & safety procedures;
- understanding of adequate procedures associated with the use and handling of hazardous materials;
- awareness of employment conditions and personnel rights;
- knowledge of, and training in, emergency procedures; and
- knowledge of the workers code of conduct.

In addition, one investment category of the Local Development Plan is to promote employment and training including through the replacement of expatriates with Guinean staff where practicable and the development of career advancement measures.

The Employment conditions and awareness management plan foresees to include English language training for non-English-speaking staff making reference to the health and safety programs, training and procedures of the Health, safety and security management plan.

The implementation of these mitigation measures will result in a moderate residual impact.

Price inflation and inequalities

A phenomenon of price inflation of local products might develop due to the increase in the demand from the Project and general increase in consumption of goods and services. Consumption growth will be due to:

- the increase in purchasing power of households having a member employed directly or indirectly by the Project
- the population growth related to the migration flows ; and
- the reduction in the self-subsistence capacities of households whose crops have been impacted (see *Section 15.2* on the physical footprint of the Project).

The increase in demand will likely result in price inflation followed by the adjustment of supply in the longer term. This phenomenon would particularly impact households with low purchasing power and with limited access to self-subsistence means of livelihood (e.g. farming, herding, fishing, etc.) particularly recent migrants or the poorest members of the communities. This would contribute towards the increased deterioration of living conditions of some

inhabitants of the area. On the other end, most wealthy inhabitants benefiting from excess production from agriculture or herding may benefit from the price increase of their goods on the market, resulting in an increase in inequalities among local communities.

This impact will have a low magnitude and receptors have high sensitivity. Its significance would therefore be moderate.

This impact will be mitigated through the development a Local Development Plan in particular that supports an increase in agricultural and herding productivity (e.g. training, provision of inputs, etc.) and promotes alternative income-generating activities and entrepreneurship (e.g. micro-credit, support to the transformation and selling of farm produce) so as to support the increase in local supply as a response to inflation.

The implementation of these mitigation measures will result in a moderate residual impact.

Increase in local development initiatives

The public revenue of the national, regional and local authorities should increase, due to the royalties and taxes that the Project will pay for the mining activity, once the Project has started. Therefore it can be expected that public spending will increase in the region and around the MA to respond to the increased population needs and expectations.

The Project may also invest in favor of community development from the start of the construction phase as part of the implementation of a Local Development Plan. These investments would participate more or less significantly in the socioeconomic impetus in the Project's area. They would particularly allow for developing the basic infrastructure, improving land productivity, economic diversification, education and health care services.

The magnitude of this impact is considered medium and its receptors sensitivity medium. Its significance is therefore considered moderate.

The measures to optimize local development initiatives in the MA are:

- to apply a principle of transparency on the contributions paid by the Project to the budget of the local, regional and national authorities;
- to involve the communities and local authorities with the development and implementation of the Project's Local Development Plan so that it is tailored to the population needs; and
- to establish a framework of collaboration with regular meetings (sub-prefectural, communal and district authorities, GAC and representatives of the subcontracting companies) to discuss public development initiatives ; and
- to participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes.

The impact will continue to have moderate significance. The improvement measures could take time to be formalized by results in terms of local development and, during the construction phase, the amounts available (apart from investment using own funds) will remain relatively low compared to those dedicated to local development in the operational phase.

Table 15.40 Mine area - impacts of the project's local content on local socioeconomic context during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement in the economic situation of recruited persons and of their households	*Moderate*	- To develop and implement an Employment conditions and awareness management plan that includes: • a description of the working conditions and terms of employment; • consideration for collective agreements and respect of the workers' right to organize and bargain collectively; • a workers accommodation quality and management policy; • a retrenchment plan; • a workers grievance process; • a stated policy against forced and harmful child labor; • provision of a safe and healthy work environment; and • a workers awareness program including ways and plan to disseminate information to workers on their rights by the means of training or communication campaigns. - To specify where the Plan it is fully applicable to subcontractors in accordance with IFC PS 2 and AfDB OS 5 and to ensure it is respected by contractors through contracts and regular auditing. - To implement commercially reasonable efforts to require suppliers and other intermediaries to apply the applicable requirements of PS 2 and AfDB OS 5 in conducting their businesses, including addressing child labor and forced labor in the supply chain.	*Moderate*
Increase in economic inequalities between households	*Major*	- To ensure local preferential hiring is continuously implemented so as to benefit to the Project still unemployed resettled people and local communities in order of priority. - To implement and fund development projects as part of the Local Development Plan with the objective to enhance economic opportunities and living conditions in the MA, in particular by supporting the creation of income-generating activities, agriculture and herding and capacity building in alternative professions.	*Moderate*
Increase in demand and in outlets for local produce, diversification of economic opportunities and reinforcement of local entrepreneurship in the RA	*Minor*	- To ensure local preferential sourcing is implemented so as to benefit to local entrepreneurs and businesses at local, regional and national level, including through a capacity building program aiming at building local business competencies to meet the Project standards including quality, health and safety requirements.	*Moderate*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Capacity-building and professional expertise in a globalized context	*Minor*	- To ensure employees and subcontractors are continuously trained on a series of topic including: • training related to the delivery of the work specific to each workstation ; • task-specific training for each new job assignment; • knowledge of risks associated with work and applicable health & safety procedures; • understanding of adequate procedures associated with the use and handling of hazardous materials; • awareness of employment conditions and personnel rights; • knowledge of, and training in, emergency procedures; and • knowledge of the workers code of conduct. - To promote employment and training including through the replacement of expatriates with Guinean staff where practicable and the development of career advancement measures as foreseen by the Local Development Plan 'Employment and Training' investment category. - To include English language training for non-English-speaking staff making reference to the health and safety programs, training and procedures as foreseen in the Employment conditions and awareness management plan for the Project.	*Moderate*
Price inflation and inequalities	*Moderate*	- To develop and implement a Local Development Plan in particular that supports the increase in agricultural and herding productivity (e.g. training, provision of inputs, etc.) and promotes alternative income-generating activities and entrepreneurship (e.g. micro-credit, support to the transformation and selling of farm produce).	*Moderate*
Increase in local development initiatives	*Moderate*	- To apply a principle of transparency on the contributions paid by the Project to the budget of the local, regional and national authorities. - To involve the communities and local authorities with the development and implementation of the Project's Local Development Plan so that it is tailored to the population needs. - To establish a framework of collaboration with regular meetings (sub-prefectural, communal and district authorities, GAC and representatives of the subcontracting companies) to discuss public development initiatives, develop a local development agreement (LDA) and a community developments plan on a collaborative basis with local authorities and widely circulate information on this tool. - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes.	*Moderate*

15.3.2.8 Impacts on health and safety

Increase in diseases related to health and hygiene conditions

The natural population growth and the growth generated by migration will result in increased pressure on the water resources and on the infrastructure related to health. Thus, the pressure on latrines would increase, whereas these are often poorly designed and poorly located (see *Section 12.2.5, Social baseline study, Water and sanitation)*, and represent a risk of contamination of the water. Further, the volume of waste generated by the local populations may significantly increase, and no collection and treatment system currently exists in the MA. The health and hygiene conditions would therefore deteriorate, resulting in a risk of expansion of diseases. This impact might be particularly concentrated in Tinguilinta and in the settlements of the RA, particularly those located near the future infrastructure of the Project.

The magnitude of this impact is considered medium and its receptors sensitivity medium. The impact therefore has a moderate significance.

The planned overarching measures to mitigate the impacts are:

- support Local Authorities in developing and implementing an Influx management plan in particular by :
  - supporting the local authorities in managing migration flows and the associated urban planning; and
  - supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration.

- develop a Local Development Plan in particular with regard to the objective to improve local communities awareness on hygiene, health and communicable diseases.

The implementation of these mitigation measures will result in a minor residual impact.

Appearance of new diseases related to population movements and migration

The arrival of migrants, often single men, and the increase in inequalities might lead to the development of risky practices such as the consumption of drugs or prostitution, particularly in the settlements of the RA, and mainly around the Project's infrastructure and Tinguilinta. Such conduct might lead to the development of new diseases, particularly sexually transmitted infections. During the construction phase, GAC plans to accommodate its workers in a temporary camp near the facilities. This concentration of single men in the same place might have a negative impact on community health and public security in the settlements located nearby (increase in risky behavior).

Further, the population growth related to migration, the increasing promiscuity of residents and the general change in living conditions might make the area, particularly Tinguilinta and the settlements of the RA located near the Project's

infrastructure, a breeding ground favorable to the spreading of epidemics (including Ebola), acute respiratory diseases, tuberculosis, malaria or other chronic diseases related to a change in lifestyle.

The magnitude of this impact is medium and its receptors sensitivity high in the RA. The impact therefore has a major significance. The impact will be negligible in the MA.

The planned overarching mitigation measures to mitigate the impacts are:

- to support Local Authorities in developing and implementing an Influx management plan in particular by:
  - supporting regional development planning that encourages distribution of opportunities across a wider area to avoid concentration of population around key Project locations;
  - undertaking urban planning and development in larger centers to accommodate in-migrants, in complement with planning for Project employee housing and infrastructure;
  - supporting development of village zoning plans for settlements at high risk from in-migration, to direct in-migrant related development to defined areas where impacts will be minimized; and
  - supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration;
- to develop a Local Development Plan in particular with regard to the objective to improve local communities awareness on hygiene, health and communicable diseases and to improve access to health infrastructure and services; and
- to communicate and enforce the Code of business conduct in particular provisions related to drug and alcohol consumption and interactions with local communities and the prohibition of illegal activities, including the use of sex workers and the consumption and/or the traffic of illegal substances.

Additional mitigation measures are:

- to train employees at their induction and continuously during the Project lifetime on health and safety risks from transmittable diseases and procedures applicable to Project employees;
- to establish a systematic medical inspection and a screening of workers at least once a year and to develop a healthcare adjustment plan (Article 143 of the Mining Code 2013); and
- to design and administer the accommodation camps in accordance with international best practices on the accommodation of workers, particularly the criteria of the IFC.

The implementation of these mitigation measures will result in a moderate residual impact.

Access to healthcare

The migration flows generated by the Project could increase the pressure on the healthcare infrastructure and result in deterioration in access to healthcare. This phenomenon will be accentuated by the development of a private healthcare sector, which people with more means (employees of the Project in particular) will be able to use. As an example, when the socioeconomic baseline study was drawn up, the consultation for primary healthcare cost GNF 2,000 in the public healthcare station compared to GNF 5,000 in the private healthcare centers.

On the other hand, the increase in the budgets dedicated to local development should allow for the construction, the maintenance and the general improvement of the basic services related to health and hygiene (healthcare stations, latrines and drinking water bodies, etc.), currently insufficient and dilapidated. The communities might therefore have better access to health. The regular visiting of the healthcare station built by the Project in Tinguilinta is testimony to the appeal of healthcare structures with competent staff.

The magnitude of this impact is large and its receptors sensitivity high. Its significance is therefore major.

In order to optimize this impact, the Project will develop a Local Development Plan and an Influx Management Plan which both have the objective to improve access to health infrastructure and quality of services.

The residual impact is major insofar as a higher number of people will be able to benefit from healthcare services.

Decrease in general security

In the RA, the increase in risky behavior induced by the arrival of migrants might contribute towards a deterioration of the safety conditions of the local populations. The consumption of alcohol and drugs, in particular, could result in altercations in the communities. Further, the growing precariousness of certain households in the area and the demographic concentration, particularly in Tinguilinta and in the settlements of the RA, located near the Project's future infrastructure, might constitute a breeding ground for the increase in theft and petty crime.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

The following measures will allow for mitigating this impact:

- to support Local Authorities in developing and implementing an Influx management plan in particular by:
  - supporting regional development planning that encourages distribution of opportunities across a wider area to avoid concentration of population around key Project locations;

- to communicate and enforce the Code of business conduct in particular provisions related to drug and alcohol consumption and interactions with local communities; and
- to accommodate workers in camp to limit interactions with local communities;
- support the public authorities for the implementation of awareness-raising campaigns on risky behavior, in collaboration with the national and international NGOs.

The residual impact will be considered minor. These mitigation measures might in fact mitigate the risks in terms of health and safety of the populations.

Decrease in road security

The population growth caused by the migration flows will probably lead to an increase in road traffic, resulting in an increased risk of accidents, particularly for the settlements in the RA.

The magnitude of this impact is medium and its receptors sensitivity medium. Its significance is therefore moderate for the RA and negligible in the rest of the study area.

The following measures will allow for mitigating this impact:

- to develop, in collaboration with the authorities, a road traffic code for the entire mine area (speed limits, sign boards, control barriers at the entrance of the settlements, etc.); and
- to support the public authorities for the implementation of awareness-raising campaigns against road accidents, in collaboration with the national and international NGOs.

The significance of the residual impact will be moderate.

Table 15.41 *Mine area - impacts of the project's local content on health and safety during construction*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in diseases related to health and hygiene conditions	*Moderate*	- To support Local Authorities in developing and implementing an Influx management plan in particular by: • supporting the local authorities in managing migration flows and the associated urban planning; and • supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration.	*Minor*
Appearance of new diseases related to population movements and migration	*Major*	- To support Local Authorities in developing and implementing an Influx management plan in particular by: • supporting regional development planning that encourages distribution of opportunities across a wider area to avoid concentration of population around key Project locations; • undertaking urban planning and development in larger centers to accommodate in-migrants, in complement with planning for Project employee housing and infrastructure; • supporting development of village zoning plans for settlements at high risk from in-migration, to direct in-migrant related development to defined areas where impacts will be minimized; and • supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration. - To develop a Local Development Plan in particular with regard to the objective to improve local communities' awareness on hygiene, health and communicable diseases. - To communicate and enforce the Code of business conduct in particular provisions related to drug and alcohol consumption and interactions with local communities and the prohibition of illegal activities, including the use of sex workers and the consumption and/or the traffic of illegal substances. - To train employees at their induction and continuously during the Project lifetime on health and safety risks from transmittable diseases and procedures applicable to Project employees. - To establish a systematic medical inspection and a screening of workers at least once a year and to develop a healthcare adjustment plan (Article 143 of the Mining Code 2013). To design and administer the accommodation camps in accordance with international best practices on the accommodation of workers, particularly the criteria of the IFC.	*Moderate*
Increased access to healthcare	*Major*	- To develop a Local Development Plan and Influx management which both have the objective to improve access to health infrastructure and quality of services.	*Major*
Decrease in security	*Moderate*	- To support Local Authorities in developing and implementing an Influx management plan in particular by supporting regional development planning that encourages distribution of opportunities across a wider area to avoid concentration of population around key Project locations. - To communicate and enforce the Code of business conduct in particular provisions related to drug and alcohol consumption and interactions with local communities.	*Minor*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in road security	*Moderate*	- To accommodate workers in camp to limit interactions with local communities. - To support the public authorities for the implementation of awareness-raising campaigns on risky behavior, in collaboration with the national and international NGOs. - To develop, in collaboration with the authorities, a road traffic code for the entire mine area (speed limits, sign boards, control barriers at the entrance of the settlements, etc.). - To support the public authorities for the implementation of awareness-raising campaigns against road accidents, in collaboration with the national and international NGOs.	*Moderate*

15.3.2.9 Impact on education

Improvement of access to education

The Project's contributions to the national and local budgets and through own investments in education infrastructure and services within the framework of the resettlements as a mitigation to the Project footprint (see *Section 15.2.2.9*), Impact on education should be able to improve access to education in the MA. These contributions could:

- increase education services (primary, secondary, vocational and higher) - currently, there is no secondary education infrastructure in the MA; and
- put in place literacy programs and youth training programs (technical or even of a higher level).

The magnitude of this impact is low and its receptors sensitivity medium. Its significance is therefore moderate.

The population growth related to the arrival of migrants will result in an increase in demand in the education sector and growing pressure on the existing school infrastructure. In parallel, some households will have a more comfortable economic situation whereas others may become poorer.

In this context, it is possible that the private education system develops and increases the inequalities in access to education. In parallel, the households that become poorer might take their girls out of school, or even all their children. Access to education is already inferior for girls. Indeed, the inequality between girls and boys as regards to education persists in the area: out of the children of primary school age (7 to 13), 43.1% of girls of the MA are educated compared to 50.4% of boys.

Therefore the Project will seek to improve access to school through measures that would also seek to reduce inequalities of access. Therefore it will develop and implement of a Local Development Plan which one of the objective is to improve access and quality of education, including by:

- participating, in collaboration with the local administrative authorities, in the construction of new primary and secondary schools and in the renovation of old ones depending on the needs;
- providing existing public schools with educational materials and consumables; and
- developing a study bursary system for the pupils and students of the poorest households, for those living in particularly isolated areas and to encourage the education of girls.

The residual impact will be major. These reinforcement measures would mean that a maximum number of persons will be able to benefit from improved access to education.

Table 15.42 Mine area - impacts of the project's local content on education during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of access to education	*Moderate*	- To develop and implement a Local Development Plan which one of the objective is to improve access and quality of education, including by: • participating, in collaboration with the local administrative authorities, in the construction of new primary and secondary schools and in the renovation of old ones depending on the needs; • providing existing public schools with educational materials and consumables; and • developing a study bursary system for the pupils and students of the poorest households, for those living in particularly isolated areas and to encourage the education of girls.	*Major*

15.3.2.10 Impacts on mobility, flows and transport

Improvement of infrastructure related to the displacements

The Project's contributions to the local development budgets and investments using own funds might be able to improve the infrastructure related to flows and transport. This change will allow for managing the increase in flows induced by the migrations particularly in the RA (pedestrians, motorcycles and vehicles). A rapid increase in flows of passengers and goods, particularly in the settlements in the RA, is also foreseeable. Through this fund, the national road might, for example, be improved.

The magnitude of this impact is negligible during the construction phase and its receptors sensitivity is low. Its significance is therefore negligible. No other specific measure is planned so far for this impact already positive.

The residual impact will be minor insofar as it would partially improve the infrastructure related to the displacement.

Table 15.43 Mine area - impacts of the project's local content on flows, mobility and transport during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of infrastructure related to the displacements	*Negligible*	- No other specific measure is planned so far for this impact already positive.	*Negligible*

15.3.2.11 Impacts on living conditions and the landscape

Noise pollution

The potential increase in the number of vehicles due to population growth will increase noise in and around Tinguilinta, and in the settlements located on the edge of the road, particularly near the process facility and other mining infrastructure where it will be cumulative from noise directly generated by the Project. Impacts and mitigation measures from noise & vibration are described in *Chapter 8, Environmental Impact Assessment for Mine Activities*. This noise pollution might cause sleeping difficulty, stress and cardiovascular diseases.

The impact is of low magnitude and its receptors sensitivity minor in the RA. The impact therefore has minor significance. In the IA, this impact will be negligible.

In order to mitigate this impact, the Project will support employee's transportation. In addition as detailed in *Section 14.6* settlements closest to the process facility and other mine infrastructure where they would be exposed to a major impact significance will be resettled due to their exposure to noise.

The residual impact is negligible insofar as the noise pollution would almost disappear with the implementation of the mitigation measures.

Table 15.44 Mine area - impacts of the project's local content on living conditions and landscape during construction phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Noise pollution	*Minor*	To support employees transportation	*Negligible*

15.3.3 Operating phase

15.3.3.1 Sources of impact

The sources of social impact of the Project on the MA during the operational phase are the following:

- creation of direct jobs by the Project to meet its labor requirements (during the operational phase GAC plans to employ on the MA 200 to 500 full-time workers, 10-15% of whom will be executives);
- creation of indirect jobs by the Project's subcontractors;
- creation of induced jobs related to the Project needs in terms of goods and services and general increase in population purchasing power;
- increase in public revenue related to the payment of the taxes paid by the Project to local and national authorities; and
- Project's contribution to a Local Development Fund (LDF) - the Mining Agreement signed between the company and the government implies that the company will pay an annual amount of USD 500,000 into the LDF for the first 15 years of the Project (Article 28.2.1, Contribution of Local Development). In the following years and until the end of the operational phase, GAC will be required to pay USD 1 million per year in favor of local development (Article 28.2.2).

15.3.3.2 Migration flows and development of land management methods

Migration flows

With the continuation of the Project's activities and for the entire operational phase, information on potential creations of jobs will continue to be circulated across the country and even in the sub-region. The arrival of non-locals seeking jobs will therefore continue. These will tend to settle near the GAC camp (Tinguilinta and settlements of the RA, particularly those near the Project's infrastructure). In parallel, it is likely that the persons who arrived at the time of the construction will remain in the area. The development of infrastructure in the MA will contribute to the appeal of the communities adjoining the Project. The population growth will therefore remain sustained during the operational phase.

During the operational phase, it is also foreseeable that people who have not found a job with the Project will migrate to settlements of the IA in order to offer their services in the agricultural and rural sectors. This migration flow would increase the social mix in the settlements of the studied area.

Consequently, the communities located near the planned infrastructure and the numerous settlements of the RA, particularly Tinguilinta, will disproportionately experience the impacts related to the migration flows (social tensions, health risks, etc.). When an impact concerns this area specifically, it is generally negligible for the IA. However, certain impacts will concern both areas (construction of basic infrastructure and community development projects for example).

Development of land management methods

The change in land management methods will probably continue with the arrival of migrants. In the MA, the land is usually managed at settlement level by traditional authorities. It is however foreseeable that the arrival of non-local people who do not own land will encourage an increase in monetary land transactions and, hence, a phenomenon of individualization of land rights. This phenomenon will mainly be concentrated on the territories of the RA, near to Tinguilinta and the Project's infrastructure. The scarcity of land might favor an ever-increasing division of plots and a speculative phenomenon both on the plots of land and on the housing. In the IA, the development of a land economic market cannot however be excluded. Arable land might be sold by certain individuals who would take advantage of their scarcity in order to cash in on their ancestral rights of access to the land.

The consequences, negative and positive, of these two types of impacts are categorized and described below.

15.3.3.3 Impacts on demographics and social dynamics

Change in the traditional family structure

The creation of jobs by the Project during the operational phase, the changes in the traditional family structure will continue. Indeed, young men will probably keep migrating to Sangarédi and Tinguilinta hoping to get a job with the company or its subcontractors.

The impact is therefore similar during the operational phase and during the construction phase throughout the MA. The change in the traditional family structure might have a medium magnitude associated with high sensitivity in the operational phase. Its significance is therefore considered major.

The mitigation measures are identical to those of the construction phase (see Section *15.3.2.3, Change in the traditional family structure*). In addition the Project will seek to collaborate with local authorities to use the LDF to support income-generating activities for the most vulnerable persons exposed to this impact.

The residual impact will be moderate insofar as the activities representing an alternative source of income could contribute to maintaining the traditional family balance.

Pressure on persons benefiting from a salaried job

The phenomenon of pressure on persons benefiting from a salaried job is the same as in the construction phase (see *Section 15.3.2.3, Pressure on persons benefiting from a salaried job*).

As in the construction phase, this impact will have a medium magnitude and receptors a medium sensitivity in the operational phase and throughout the MA. Its significance is therefore considered moderate.

To limit this impact, the Project will put the same mitigation measures in place as in the construction phase. In addition to this, it may support the local authorities to direct the funds of the LDF to the support of income-generating activities for the most vulnerable persons exposed to this impact.

The residual impact will be moderate, due to the sensitivity of the receptor environment and the difficulty in managing this impact.

Increase in social tensions and conflicts

The risk of increase in social tensions and conflicts is similar, in the operational phase, to what was identified in the construction phase (see *Section 15.3.2.3, Increase in social tensions and conflicts*). Indeed, the sources of tensions (migration flows, limited number of jobs offered by the company and its subcontractors, and concentration of young men) will still strengthen increase during operations.

The magnitude of this impact is considered medium, its receptors' sensitivity high, and its significance major in the RA. They will be negligible in the IA.

The planned measures to mitigate these impacts are identical to those of the construction phase. In addition the Project will seek to collaborate with local authorities to use the LDF to support income-generating activities for the most vulnerable persons exposed to this impact.

The residual impact will be moderate. Promoting alternative sources of income will help address some of the social tensions and conflicts.

Table 15.45 Mine area - impacts of the project's local content on demographics and social dynamics during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Change in the traditional family structure	*Major*	- To ensure local preferential hiring is implemented following measures described in so as to benefit to the Project resettled people and local communities in priority. - To implement and fund development projects as part of the Local Development Plan in order to reinforce or create income generating activities especially those performed by women. - To collaborate with local authorities to influence their use the LDF in support income-generating activities for the most vulnerable persons exposed to this impact.	*Moderate*
Pressure on persons benefiting from a salaried job	*Moderate*	- To implement and fund development projects as part of the Local Development with the objective to enhance economic opportunities and living conditions in the MA, in particular by • supporting income-generating activities for women(e.g. market garden activities, palm oil production, dyeing, etc.) and men (e.g. farming, herding, joinery, mechanics, etc.) through the provision of training, materials, funding, etc.; and • to fund community development projects to enhance public infrastructure and services. - To collaborate with local authorities to influence their use the LDF in support income-generating activities for the most vulnerable persons exposed to this impact.	*Moderate*
Increase in social tensions and conflicts	*Major*	- To ensure local preferential hiring is so as to benefit to the Project resettled people and local communities in priority. - To implement and fund development projects as part of the Local Development Plan in order to reinforce or create income generating activities especially those performed by women. - To collaborate with local authorities to influence their use the LDF in support income-generating activities for the most vulnerable persons exposed to this impact.	*Moderate*

15.3.3.4 *Impact on powers, governance and civil society*

Weakening of methods of traditional governance

The risk of weakening of methods of traditional governance throughout the MA is similar, in the operational phase, to what was identified in the construction phase (see *Section 15.3.2.4, Weakening of methods of traditional governance*). Indeed, the migrants will keep arriving, and they might not subscribe to the local traditional governance system. In addition, land management issues might be more predominant.

The magnitude of this impact is considered low and its receptors' sensitivity high. The impact therefore has a moderate significance.

To mitigate the risk of weakening of the traditional governance method, the measures to be put in place are identical to those proposed in the construction phase.

The residual impact will be minor. Indeed, the collaboration with the traditional authorities will ensure them a role in the Project, thus reducing the significance of the impact. The sensitivity to the impact might also be mitigated insofar as the communities will see their traditions respected.

Strengthening of civil society around intellectuals and workers

There should be continuity in the reinforcement of civil society in the settlements of the MA, a dynamic that was initiated during the construction phase. NGOs and other associations might develop in the MA and more people will benefit from mitigation measures, which could participate in a reinforcement of their general competencies.

The magnitude of this impact is considered low and its receptors sensitivity high. Its significance is therefore moderate.

The planned improvement measures to develop this impact are the same as those in the construction phase (see *Section 15.3.2.4, Reinforcement of civil society around intellectuals and workers*).

The residual positive impact will be major.

Increase in the risk of poor financial management and tensions between communities and local administrative authorities

The risk of poor financial management and tensions between communities and local administrative authorities will be similar, in the operational phase, to what was identified in the construction phase (see *Section 15.3.2.4, Increase in the risk of poor financial management and tensions between communities and local administrative authorities*). It will however be accentuated by the fact that the Project's contribution to local development will increase through the LDF.

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a major significance in the entire MA.

The mitigation measures to avoid tensions between communities and authorities are similar to those recommended in the construction phase.

The residual impact is considered moderate. These mitigation measures will in fact allow for limiting the risks of corruption and enhance the benefits of the funds to the population thereby defusing underlying conflicts in advance.

Table 15.46 Mine area - impacts of the project's local content on powers, governance and civil society during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Weakening of methods of traditional governance	*Moderate*	- To collaborate closely with local authorities in the implementation of a RAP and the development of a Local Development Plan.	*Minor*
Reinforcement of civil society around intellectuals and workers	*Moderate*	- To implement and fund development projects as part of the Local Development Plan with the objective to improve access and quality of education in the area. - To engage regularly with the associations and organizations of citizens as part of the Project Stakeholder Engagement Plan.	*Major*
Increase in risks of corruption and tensions between communities and local administrative authorities	*Major*	- To apply a principle of transparency on the contributions paid by the Project to the budget of the local communities and financing of development activities using GAC's own funds. - To support the local authorities in their financial management and communications related to expenses for the local development. - To involve the sub-prefectural, communal and district authorities in identifying and implementing development projects (particularly the basic infrastructure) supported by GAC using own funds; - To establish a framework of collaboration with regular meetings (sub-prefectural, communal and district authorities, GAC and representatives of the subcontracting companies). - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes. - To use an effective and transparent grievance mechanism.	*Moderate*

15.3.3.5 Impacts on the land

Increase in inequalities of access to land resources

The phenomena described in the construction phase are likely to accentuate in the operational phase since migrants will keep arriving and the number of land transactions will keep increasing: monetization of land, individualization of rights, increase in land pressure and price inflation.

The magnitude of this impact is considered medium and its receptors sensitivity medium in the operational phase. The significance is therefore moderate.

The planned mitigation measure is similar to the one proposed in the construction phase (see *Section 15.3.2.5, Accentuation of inequalities of access to land resources*). The residual significance will be minor.

Table 15.47 Mine area - impacts of the project's local content on land tenure during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in inequalities of access to land resources	*Moderate*	- To support Local Authorities in developing of an Influx Management Plan as an overarching mitigation measures is expected to mitigate this impact, in particular by: • supporting local authorities in urban planning and development in larger centers to accommodate in-migrants, in complement with planning for Project employee housing and infrastructure; and • supporting development of village zoning plans for settlements at high risk from in-migration, to direct in-migrant related development to defined areas where impacts will be minimized and to encourage local people to remain in their villages.	*Minor*

15.3.3.6 *Impact on agriculture and cattle herding*

Increase in the cost of farm labor

This dynamic initiated in the construction phase would continue during the operational phase (see *Section 15.3.2.6, Increase in the cost of farm labor*). Indeed, more young people might leave rural work behind to find a job with the Project and communities will probably have to use more external farm labor.

The magnitude of this impact is considered low and its receptors sensitivity medium in the operational phase throughout the MA. The significance is therefore minor.

To mitigate this impact, the Project would have to continue implementing and monitoring the same measures as in the construction phase.

In this way, young people would be less inclined to abandon their agricultural activities without being certain of getting a job with the Project or its subcontractors. The support programs could encourage them to continue their agricultural activities. The residual impact will therefore be negligible.

Table 15.48 Mine area - impacts of the project's local content on agriculture and cattle herding during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in the cost of farm labor	*Minor*	- To ensure local preferential hiring is implemented in particular through the wide communication available jobs, required skills and hiring procedures in order to avoid that young people abandon their land in an unfruitful search for work. - To implement and fund development projects as part of the Local Development Plan in order to improve agricultural productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.) resulting in a reinforced attractiveness of agriculture compared to uncertain jobs at the mine.	*Negligible*

15.3.3.7 Impacts on the local socioeconomic context

Improvement in the economic situation of recruited persons and of their households

The improved economic situation of the persons recruited and of their households would be identical in the operational phase, to the one identified in the construction phase (see *Section 15.3.2.7, Improvement in the economic situation of recruited persons and of their households*). They will indeed benefit from stable monthly income and will no longer be exposed to economic uncertainties related to agricultural activities.

The impact will have a low magnitude – the number of people recruited on the long-term will probably be quite low - but receptors have a very high sensitivity. Its significance would therefore be moderate.

To reinforce this impact, the Project will endeavor to follow the same measures as those in the construction phase.

The residual impact is considered moderate. These measures will guarantee a financially and humanly acceptable situation to the persons recruited by the Project without however the significance of this becoming high.

Increase in economic inequalities between households

The mechanisms described in the construction phase might be accentuated in the operational phase (see *Section 15.3.2.7, Increase in economic inequalities between households*). Households with one member recruited by the Project will keep improving their economic situation while more households will be concerned by the deterioration in their situation because of the impact of operations on land accessibilities and because of price inflation generated by the increase in local demand with the arrival of migrants.

The impact is considered of medium magnitude and receptors' sensitivity high. The significance is therefore major.

The same measures as in the construction phase may be followed. In addition the Project will seek to collaborate with local authorities towards their use of the LDF in support of income-generating activities, agriculture and herding and capacity building in alternative professions.

The residual impact is considered moderate, since these mitigation measures could limit the economic inequalities between households.

Increase in demand and in outlets for local produce, diversification of economic opportunities and reinforcement of local entrepreneurship

During the operational phase, the demand of communities and migrants for goods and services will continue to increase in the study area. Local entrepreneurship might therefore continue to develop to respond to this increase in requirements.

The requirements related to the Project (supply of materials, equipment, etc.) might continue to create outlets for the local or Guinean entrepreneurs with a significant impact on the boosting of the local economy.

The magnitude of this impact is considered low and its receptors sensitivity medium. Its significance is therefore minor in the RA. It is negligible in the IA.

The measures to reinforce this impact are the same as those in the construction phase (see *Section 15.3.2.7, Increase in local development initiatives*).

The residual impact could be moderate insofar as the local companies should benefit from more outlets.

Capacity-building and professional expertise in a globalized context

The capacity-building and professional expertise phenomenon in a globalized context might be similar in the operational phase to the one identified in the construction phase (see *Section 15.3.2.7, Professional capacity-building in a globalized context*). Employees at the company or with subcontractors will keep improving their skills and gain more and more professional experience.

The magnitude of this impact is considered low insofar as few people will be concerned. Its receptors sensitivity is considered high. Its significance is therefore moderate.

The measures to reinforce this impact are the same as those in the construction phase.

The residual impact could be major. These improvement measures may in fact ensure capacity-building for all of the local workers, but also for some people who could not be recruited.

Price inflation and inequalities

The price inflation of local products might continue in the operational phase, stimulated by the increase in demand from migrant households and improved purchasing power of households benefiting from employment.

The increase in demand experienced during the construction period will likely result in price inflation followed by the adjustment of supply on the longer term throughout the operational phase. This phenomenon would particularly impact households with low purchasing power and with limited access to self-subsistence means of livelihood (e.g. farming, herding, fishing, etc.) such as recently in-migrated people or poorest member of the communities. This would contribute towards the increased deterioration of living conditions of some inhabitants of the area. On the other end, most wealthy inhabitants benefiting from excess production from agriculture or herding may benefit from the price increase of their goods on the market, resulting in an increase in inequalities among local communities.

This impact will have a low magnitude and receptors have a high sensitivity. Its significance would therefore be moderate.

To minimize this trend, the same measures as in the construction phase might be followed (see *Section 15.3.2.7, Price inflation and inequalities*).

The residual impact will be moderate. These measures could in fact limit the phenomenon of inflation by assuring a quicker adjustment by the supply.

Increase in local development initiatives

The public revenue will keep increasing due to the royalties and taxes that the Project will pay for the mining production in the operational phase.

During the operational phase, the budgets dedicated to development will increase further from the provision by the Project of the LDF, as required by Article 130 of the Mining Code 2013.

The Project should continue to invest using own funds in favor of community development. These investments will participate in the socioeconomic impetus in the Project's area. They will particularly allow for the development of basic infrastructure (schools, healthcare centers, etc.).

Finally, the economic development of the MA will lead to an increase in tax revenue that could allow the State to increase these public expenses.

The magnitude of this impact is considered large and its receptors sensitivity medium. Its significance is therefore considered major.

The measures reinforcing this impact are identical to those proposed for the construction phase (see *Section 15.3.2.7, Increase in local development initiatives*). In addition the Project will collaborate with local authorities towards their efficient use of the LDF in support of local development initiatives.

The residual impact will therefore be of major significance. These measures will be able to optimize the positive outcomes in terms of development.

Table 15.49 Mine area - impacts of the project's local content on socioeconomic context during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement in the economic situation of recruited persons and of their households	*Moderate*	- To develop and implement an Employment conditions and awareness management plan that includes: • a description of the working conditions and terms of employment; • consideration for collective agreements and respect of the workers' right to organize and bargain collectively; • a workers accommodation quality and management policy; • a retrenchment plan; • a workers grievance process; • a stated policy against forced and harmful child labor; • provision of a safe and healthy work environment; and - A workers awareness program including ways and plan to disseminate information to workers on their rights by the means of training or communication campaigns. - To specify where the Plan it is fully applicable to subcontractors in accordance with IFC PS 2 and AfDB OS 5 and to ensure it is respected by contractors through contracts and regular auditing. - To implement commercially reasonable efforts to require suppliers and other intermediaries to apply the applicable requirements of PS 2 and AfDB OS 5 in conducting their businesses, including addressing child labor and forced labor in the supply chain. - To ensure, both under agreements signed with subcontracting companies and in practices in the field, that the commitments GAC has made in favor of employees and the communities impacted are respected by all Project's stakeholders (random checks might be put in place to check the working conditions in the subcontracting companies of the Project).	*Moderate*
Increase in economic inequalities between households	*Major*	- To ensure local preferential hiring is continuously implemented so as to benefit to the Project still unemployed resettled people and local communities in order of priority. - To implement and fund development projects as part of the Local Development Plan with the objective to enhance economic opportunities and living conditions in the MA, in particular by supporting the creation of income-generating activities, agriculture and herding and capacity building in alternative professions. - To collaborate with local authorities towards their use of the LDF in support of income-generating activities, agriculture and herding and capacity building in alternative professions.	*Moderate*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in demand and in outlets for local produce and diversification of economic opportunities / reinforcement of local entrepreneurship	*Minor*	- To ensure local preferential sourcing is implemented so as to benefit to local entrepreneurs and businesses at local, regional and national level, including through a capacity building program aiming at building local business competencies to meet the Project standards including quality, health and safety requirements.	*Moderate*
Capacity-building and professional expertise in a globalized context	*Moderate*	- To ensure employees and subcontractors are continuously trained on a series of topic including: • training related to the delivery of the work specific to each workstation ; • task-specific training for each new job assignment; • knowledge of risks associated with work and applicable health & safety procedures; • understanding of adequate procedures associated with the use and handling of hazardous materials; • awareness of employment conditions and personnel rights; • knowledge of, and training in, emergency procedures; and • knowledge of code of conduct by workers. - To promote employment and training including through the replacement of expatriates with Guinean staff where practicable and the development of career advancement measures as foreseen by the Local Development Plan 'Employment and Training' investment category. - To include English language training for non-English-speaking staff making reference to the health and safety programs, training and procedures as foreseen in the Employment conditions and awareness management plan for the Project.	*Major*
Price inflation	*Moderate*	- To develop and implement a Local Development Plan in particular that supports the increase in agricultural and herding productivity (e.g. training, provision of inputs, etc.) and promotes alternative income-generating activities and entrepreneurship (e.g. micro-credit, support to the transformation and selling of farm produce).	*Moderate*
Increase in local development initiatives	*Major*	- To apply a principle of transparency on the contributions paid by the Project to the budget of the local, regional and national authorities. - To involve the communities and local authorities with the development and implementation of the Project's Local Development Plan so that it is tailored to the population needs. - To establish a framework of collaboration with regular meetings (sub-prefectural, communal and district authorities, GAC and representatives of the subcontracting companies) to discuss public development initiatives financed by the Local Development Plan. - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes.	*Major*

15.3.3.8 Impacts on health and safety

Increase in diseases related to health and hygiene conditions

The risk of an increase in diseases related to health and hygiene conditions would increase during the operational phase, mainly in the RA. Continuous inflows of migrants will indeed increase pressure on sanitation and health infrastructure.

The magnitude of the impact is considered large and its receptors sensitivity is considered medium. The impact therefore has a major significance.

The mitigation measures of the impacts are identical to those recommended in the construction phase (see *Section 15.3.2.8, Increase in diseases related to health and hygiene conditions*).

The residual impact will be moderate. These mitigation measures would prevent problems related to health and hygiene and therefore limit the source of impact.

Appearance of new diseases related to population movements and migration

The health risks related to the arrival of migrants during the construction phase might be accentuated during the operational phase. More people might have risky practices (drugs consumption, prostitution, etc.) and the growing population in Tinguilinta and the settlements of the RA will be ground for even more favorable conditions to the spreading of diseases.

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a major significance.

The measures to mitigate this impact are similar to those proposed for the construction phase. In addition, the Project will collaborate with local authorities towards their use of the LDF in support of the development of healthcare infrastructure in the region.

The residual impact will be moderate. These mitigation measures will prevent problems related to the health and safety conditions, and therefore limit the source of impact.

Access to health care services

The trend towards an improvement of healthcare services, identified in the construction phase, could continue during the operational phase (see *Section 15.3.2.8, Access to healthcare services*). Indeed, increase in the budgets dedicated to local development should allow a continuous improvement of basic services related to health and hygiene.

However, as in the construction phase, inequalities in access to healthcare could grow due to a potential reduction in the budget dedicated to healthcare of

certain households and the emergence of private services reserved for the best-off categories of the population. Optimizing measures to increase healthcare services will be tailored so as to reduce, concomitantly, inequalities of access.

The magnitude of this impact is considered large and its receptors sensitivity high. The significance of the impact is major.

To reinforce this impact, the Project will put the same measures in place as those considered in the construction phase. In addition the Project will collaborate with local authorities towards their use of the LDF in support of the development of public healthcare infrastructure and services in the region.

The residual impact is considered major. These measures will in fact be able to optimize the positive outcomes of the Project and a higher number of people will be able to benefit from quality healthcare services.

Decrease in general security

The trend towards an increase in risks in terms of safety of the populations, mainly in the RA, might continue in the operational phase. Indeed, the concentration of population in Tinguilinta and the RA will increase and might lead to more vulnerability, violence and the rise of petty crime.

The magnitude of this impact is medium and its receptors sensitivity high. Its significance is therefore major.

The measures that will allow for mitigating this impact are the same as those in the construction phase (see *Section 15.3.2.8*).

The residual impact will be considered moderate.

Decrease in road security

The road traffic related to the population growth should increase in the operational phase with the continued population growth, particularly in the communities of the RA.

The magnitude of this impact is medium and its receptors sensitivity medium. Its significance is therefore moderate.

The measures identical to those recommended in the construction phase will allow for mitigating this impact (see *Section 15.3.2.8*, *Decrease in road security*).

The residual impact will be moderate.

Table 15.50 Mine area - impacts of the project's local content on health and safety during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in diseases related to health and hygiene conditions	*Major*	- To support Local Authorities in developing and implementing an Influx management plan in particular by: • supporting the local authorities in managing migration flows and the associated urban planning; and • supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration. - To develop a Local Development Plan in particular with regard to the objective to improve local communities awareness on hygiene, health and communicable diseases.	*Moderate*
Appearance of new diseases related to population movements and migration	*Major*	- To support Local Authorities in developing and implementing an Influx management plan in particular by: • supporting regional development planning that encourages distribution of opportunities across a wider area to avoid concentration of population around key Project locations; • undertaking urban planning and development in larger centers to accommodate in-migrants, in complement with planning for Project employee housing and infrastructure; • supporting development of village zoning plans for settlements at high risk from in-migration, to direct in-migrant related development to defined areas where impacts will be minimized; and • supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration. - To develop a Local Development Plan in particular with regard to the objective to improve local communities awareness on hygiene, health and communicable diseases. - To communicate and enforce the Code of business conduct in particular provisions related to drug and alcohol consumption and interactions with local communities and the prohibition of illegal activities, including the use of sex workers and the consumption and/or the traffic of illegal substances. - To train employees at their induction and continuously during the Project lifetime on health and safety risks from transmittable diseases and procedures applicable to Project employees. - To establish a systematic medical inspection and a screening of workers at least once a year and to develop a healthcare adjustment plan (Article 143 of the Mining Code 2013). - To design and administer the accommodation camps in accordance with international best practices on the accommodation of workers, particularly the criteria of the IFC. - To collaborate with local authorities towards their use of the LDF in support of the development of healthcare infrastructure in the region.	*Moderate*
Increased access to health care	*Major*	- To develop a Local Development Plan and Influx management which both have the objective to improve access to health infrastructure and quality of services. - To collaborate with local authorities towards their use of the LDF in support of the development of public healthcare infrastructure and services in the region.	*Major*
Decrease in general security	*Major*	- To support Local Authorities in developing and implementing an Influx management plan in particular by supporting regional development planning that encourages distribution of opportunities across a wider area to avoid concentration of population around key Project locations.	*Moderate*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in road security	*Moderate*	- To communicate and enforce the Code of business conduct in particular provisions related to drug and alcohol consumption and interactions with local communities. - To accommodate workers in camp to limit interactions with local communities. - To support the public authorities for the implementation of awareness-raising campaigns on risky behavior, in collaboration with the national and international NGOs. - To develop, in collaboration with the authorities, a road traffic code for the entire mine area (speed limits, sign boards, control barriers at the entrance of the settlements, etc.). - To support the public authorities for the implementation of awareness-raising campaigns against road accidents, in collaboration with the national and international NGOs.	*Moderate*

15.3.3.9 Impact on education

Improvement of access to education

The Project's contributions to the LDF should be able to improve access to education in the MA: improvement of education services, literacy programs and technical and business skills training courses.

The magnitude of this impact is low and its receptors sensitivity medium. Its significance is therefore moderate.

However the increased pressure on infrastructure, reduction in the budget dedicated to education of certain households and emergence of private services reserved for those with a high income may result in increased inequalities in terms of access to education for the poorest and the girls.

The measures to reinforce access to education while seeking to reduce inequalities of access are identical to those identified in the construction phase (see *Section 15.3.2.9, Improvement of access to education*). In addition the Project will collaborate with local authorities towards their use of the LDF in support of the development of public education infrastructure and services in the region.

The residual impact will be major. These reinforcement measures would mean that a maximum number of persons will be able to benefit from improved access to education including the poorest children and the girls.

Table 15.51 Mine area - impacts of the project's local content on education during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of access to education	*Moderate*	- To develop and implement a Local Development Plan which one of the objective is to improve access and quality of education, including by: • participating, in collaboration with the local administrative authorities, in the construction of new primary and secondary schools and in the renovation of old ones depending on the needs; • providing existing public schools with educational materials and consumables; • developing a study bursary system for the pupils and students of the poorest households, for those living in particularly isolated areas and to encourage the education of girls. - To collaborate with local authorities towards their use of the LDF in support of the development of public education infrastructure and services in the region.	*Major*

15.3.3.10 Impacts on mobility, flows and transport

Improvement of infrastructure related to the displacements

The trend towards an improvement of infrastructure related to the displacements identified in the construction phase will continue during the operational phase (see *Section 15.3.3.10, Improvement of infrastructure related to the displacements*).

The magnitude of this impact is low during the operational phase since it will mainly concern the RA and its receptors sensitivity is low. Its significance is therefore minor.

No other measure planned to improve this impact already positive so far. The Project could further assess the need to put in place other measures if necessary.

The residual impact will be moderate insofar as it would partially improve the infrastructure related to the displacement.

Table 15.52 Mine area - impacts of the project's local content on mobility, flows and transport during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of infrastructure related to the displacements	*Low*	- The impact is already positive. No improvement measure planned so far.	*Low*

15.3.3.11 Impact on living conditions and the landscape

Noise pollution

The risk of noise pollution identified for the RA in the construction phase might be identical in the operational phase (see *Section 15.3.2.11, Noise pollution*) and will be related to the increased number of vehicles used by the population in the RA around Tinguilinta, process facilities and other mining infrastructure where it will be cumulative from noise directly generated by the Project. Impacts and mitigation measures from noise & vibration are described in *Chapter 8, Environmental Impact Assessment for Mine Activities*. This noise pollution might cause sleeping difficulty, stress and cardiovascular diseases.

The impact is of low magnitude and its receptors sensitivity minor in the RA. The impact therefore has minor significance. In the IA, this impact will be negligible.

In addition as detailed in *Section 14.6* settlements closest to the process facility and other mine infrastructure will be resettled due to their exposure to noise.

The residual impact will remain minor insofar as the noise pollution related to the increase in road traffic will not disappear totally despite the implementation of the mitigation measures.

Table 15.53 Mine area - impacts of the project's local content on living conditions and landscape during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Noise pollution	*Minor*	-	*Minor*

15.3.4 Closure phase

15.3.4.1 Sources of impact

The direct sources of impact on the MA during the closure phase in terms of the Project's direct contributions to local economic development are the following:

- termination of jobs by the Project and its subcontractors;
- closure of the local development initiatives initiated using own funds; and
- end of the contributions to the institutional budgets dedicated to local development.

15.3.4.2 Foreseeable migration flows

With the closure of the Project's activities, we might see the departure of many households not locals to the area. We might therefore see a significant reduction in the population settled in the MA, particularly in the settlements of the RA located near the camp and the infrastructure of the Project.

In parallel, persons originally from the area who migrated to the RA during the construction or operational phase might return to the IA in order to seek new economic opportunities (reinvestment in rural works).

The consequences, negative and positive, are categorized and described below.

15.3.4.3 Impacts on demographics and social dynamics

Increase in social tensions and conflicts

The demobilization of the workers of the Project and of its subcontractors might result in a difficult situation caused by the likely increase in the unemployment rate, particularly around Tinguilinta. Tensions might arise between the former workers and the other residents of the area.

It is also possible that the former workers and the local authorities attempt to appropriate the equipment and the materials that the Project will demobilize. This phenomenon could create a climate of competition that would cause tensions.

The impact will have a medium magnitude and receptors have high sensitivity. Its significance is considered major in the RA, and should be negligible in the IA.

To mitigate this impact, the Project will implement the following measures:

- to implement the Employment conditions and awareness management plan in particular with regard to the development of a retrenchment plan for all employees and the provision of English language training for non-English-speaking staff;

- to reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see Section *15.3.3.7*, *Capacity-building and professional expertise in a globalized context*);
- to reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives :
  - promoting employment and training including through the provision of professional training courses and training on job-seeking;
  - promoting business development by supporting income generating activities;
  - promoting land based productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.); and
  - increase efforts in capacity building of its partners (e.g. NGOs, institutions, local administrations, etc.) with the aim to prepare for a transition and ensure continuity of LDP's programs and benefits after the Project closure.

- to report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it; and
- to ensure mine closure and rehabilitation is performed including through careful supervision and monitoring of the demobilization activities.

The residual impact will be considered moderate.

Table 15.54 Mine area - impacts of the project's local content on demographics and social dynamics during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in social tensions and conflicts	*Major*	- To implement the Employment conditions and awareness management plan in particular with regard to the development of a retrenchment plan for all employees and the provision of English language training for non-English-speaking staff. - To reinforce, before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.2.7*, *Professional capacity-building in a globalized context*). - To reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives : • promoting employment and training including through the provision of professional training courses and training on job-seeking; • promoting business development by supporting income generating activities; • promoting land based productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.); • increase efforts in capacity building of its partners (e.g. NGOs, institutions, local administrations, etc.) with the aim to prepare for a transition and ensure continuity of LDP's programs and benefits after the Project closure. - To report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it. - To ensure mine closure and rehabilitation is performed including through careful supervision and monitoring of the demobilization activities.	*Moderate*

15.3.4.4 Impacts on powers, governance and civil society

Risks of tension between communities and local administrative authorities

When the workers are demobilized, it is possible that tensions increase within families, settlements and with the local authorities, given the state of uncertainty of the populations about their future. In parallel, these tensions will be accentuated by the fact that the resources generated by the Project and dedicated to local development will reduce, resulting in an end to the development impetus of the area. If the population is poorly informed of the Project's deadlines and the possible reduction of budgets dedicated to local development, it is likely to accuse the authorities of embezzlement of funds.

The impact will have a medium magnitude since it might not be a long-term impact, and medium sensitivity. Its significance is considered moderate.

The mitigation measures to avoid tensions between communities and authorities are the following:

- to collaborate regularly with the sub-prefectural and communal authorities in order to keep them informed and prepare them for the closure of the Project and collect information on the possible factors of tensions and conflicts in the mine area;
- to participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes; and
- to support the local authorities in their communication steps related to closure of the Project.

The residual impact is considered minor.

Weakening of civil society

The civil society organizations that benefited from the presence of GAC may lose influence. The settlement organizations defending the interests of the communities might disappear with the end of activities. However, the overall reinforcement of civil society through education, training and better knowledge of its rights could be maintained after the closure.

The magnitude of this impact is therefore considered low and its receptors sensitivity medium. Its significance is therefore minor.

The mitigation measure to ensure the maintenance of a strong civil society is to regularly inform the organizations and associations of civil society on the closure of the Project.

The residual impact is considered minor.

Table 15.55 Mine area - impacts of the project's local content on powers, governance and civil society during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Risks of tension between communities and local administrative authorities	*Moderate*	- To collaborate regularly with the sub-prefectoral and communal authorities in order to keep them informed and prepare them for the closure of the Project and collect information on the possible factors of tensions and conflicts in the mine area. - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes. - To support the local authorities in their communication steps related to closure of the Project.	*Minor*
Weakening of civil society	*Minor*	- To regularly inform the organizations and associations of civil society on the closure of the Project as part of the Stakeholder Engagement Plan.	*Minor*

15.3.4.5 Impact on the land

Reduced pressure on land resources

The closure of the Project is likely to result in emigration of people who came to the area in the hope of finding a job. It is possible that those who bought land, particularly for housing, wish to resell it. In this context, the land pressure is therefore likely to fall, and the prices of land might follow the same trend, particularly in the RA and in Tinguilinta. Thus, the land would become financially accessible to a larger majority of the population.

It should be noted that the phenomenon of individualization of land rights that might appear during the construction and operational phase will probably not disappear.

The magnitude of the reduction in pressure on the land resources is considered low and its receptors sensitivity medium. The significance is therefore minor.

During the process of resettlement occurring at the start of the Project construction and the Mine closure and rehabilitation process seeking to hand over the land to the Communities, the Project will have closely collaborated with local authorities around land management questions. It is expected that local authorities will have gained in land management capacity and that management support from the Project can continue where applicable.

The residual impact will remain minor insofar as the phenomenon of individualization of management and administration rights will is expected to continue after Project closure.

Table 15.56 Mine area - impacts of the project's local content on land tenure during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduced pressure on land resources	*Minor*	- To support the authorities in their management of the land available where applicable.	*Minor*

15.3.4.6 Impacts on agriculture and cattle herding

Decrease in the cost of farm labor

It is possible that some demobilized workers return to their original settlements and wish to resume agricultural activities. The increased availability of labor might cause a reduction in the need to make use of external workers and a fall in the price of local labor. However, this phenomenon might be low insofar as some demobilized workers might not return to traditional activities and undergo retraining in another sector.

This impact will have a low magnitude and its receptors a medium sensitivity. Its significance would therefore be considered minor.

To reinforce this impact, the Project will implement the following mitigation measures:

- to reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.2.7*, *Professional capacity-building in a globalized context*);
- to reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives :
    - promoting employment and training including through the provision of professional training courses and training on job-seeking;
    - promoting business development by supporting income generating activities for unemployed people;
    - promoting land based productivity and return to agricultural and herding activities (e.g. through training, provision on of seeds, fertilizers and tools, etc.); and
    - increase efforts in capacity building of its partners (e.g. NGOs, institutions, local administrations, etc.) with the aim to prepare for a transition and ensure continuity of LDP's programs and benefits after the Project closure.
- as part of Stakeholder Engagement activities, to report on the mine closure plan, with sufficient notice so that the communities and the authorities can prepare themselves for it, including by investing in their former land based subsistence activities.

The residual impact will be moderate insofar as not all the former workers will resume their agricultural activities if other professional opportunities arise.

Table 15.57 Mine area - impacts of the project's local content on agriculture and cattle herding during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Decrease in the cost of farm labor	*Minor*	- To reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.2.7, Professional capacity-building in a globalized context*). - To reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives : • promoting employment and training including through the provision of professional training courses and training on job-seeking; • promoting business development by supporting income generating activities for unemployed people; • promoting land based productivity and return to agricultural and herding activities (e.g. through training, provision on of seeds, fertilizers and tools, etc.); • increase efforts in capacity building of its partners (e.g. NGOs, institutions, local administrations, etc.) with the aim to prepare for a transition and ensure continuity of LDP's programs and benefits after the Project closure. - As part of Stakeholder Engagement activities, to report on the mine closure plan, with sufficient notice so that the communities and the authorities can prepare themselves for it, including by investing in their former land based subsistence activities.	*Moderate*

15.3.4.7 Impacts on the local socioeconomic context

Fall in demand and economic recession

Upon closure, the MA might go through a major recession phase. Indeed, some demobilized workers might experience a period of unemployment if they do not succeed in reworking quickly. The purchasing power of the households of these workers would significantly fall. Other demobilized workers will probably leave the area in search of another job. Finally, the local small and medium-sized enterprises whose main client was the Project would lose their main outlets. Although the number of workers for the Project is not high, their wealth will represent a large part of the households' wealth.[1]

Consequently, an overall fall in demand should occur when the Project is closed. This phenomenon is likely to result in an overall impoverishment of the area.

The impact will have a large magnitude and receptors have high sensitivity. Its significance would therefore be major.

In order to mitigate this impact, the Project will need to support its workers by optimizing their employability and to foster its efforts towards the diversification of the local economy. The following measures will be implemented by the Project to mitigate this impact:

- to implement the Employment conditions and awareness management plan in particular with regard to the development of a retrenchment plan for all employees and the provision of English language training for non-English-speaking staff;
- to reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.3.7 Capacity-building and professional expertise in a globalized context*);
- to reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives :
  - promoting employment and training including through the provision of professional training courses and training on job-seeking;
  - promoting business development by supporting income generating activities;
  - promoting land based productivity (*e.g.* through training, provision on of seeds, fertilizers and tools, etc.); and
- to report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it.

The residual impact will remain moderate to major despite the implementation of these mitigation measures.

[1] As seen in the SBS, the mining sector in the south of the concession today represents 0,5 % of workers but 4,4 % of total income, i.e. 9 times the volume of activity.

Decrease in local development initiatives

Upon closure, the public revenue will reduce due to the fact that the Project will cease to pay the taxes due for the mining production, to pay into the LDF and to put in place community development projects financed using own funds.

The magnitude of this impact is considered large and its receptors sensitivity high. Its significance is therefore major.

In order to mitigate this impact, the Project will need to ensure programs of its Local Development Plan (LDP) are developdevelopdeveloped with the aim to ensure long-term sustainability of its programs or benefits through:

- capacity building of the program participants and beneficiaries;
- support to self-subsistence and food security;
- diversification of incomes and opportunities;
- partnerships with Guinean or local community based organizations, NGOs, government or institutions and businesses; and
- collaboration and support to local authorities in their use of the LDF so that public development initiatives, including new public infrastructure and services are correctly maintained and managed at financial equilibrium.

The residual impact will be of moderate significance insofar as the development initiatives could last and continue to benefit the communities of the MA.

Table 15.58 Mine area - impacts of the project's local content on local socioeconomic context during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Fall in demand and economic recession	*Major*	- To implement the Employment conditions and awareness management plan in particular with regard to the development of a retrenchment plan for all employees and the provision of English language training for non-English-speaking staff. - To reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.2.7, Professional capacity-building in a globalized context*). - To reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives : • promoting employment and training including through the provision of professional training courses and training on job-seeking; • promoting business development by supporting income generating activities; • promoting land based productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.); and • increase efforts in capacity building of its partners (e.g. NGOs, institutions, local LDP's programs and benefits after the Project closure. - To report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it.	*Major*
Decrease in local development initiatives	*Major*	- To ensure programs of its Local Development Plan are develop with the aim to ensure long-term sustainability of its programs or benefits through: • capacity building of the program participants and beneficiaries; • support to self-subsistence and food security; • diversification of incomes and opportunities; and • partnerships with Guinean or local community based organizations, NGOs, government or institutions and businesses. - To collaborate and support local authorities in their use of the LDF so that public development initiatives, including new public infrastructure and services are correctly maintained and managed at financial equilibrium.	*Moderate*

15.3.4.8 Impacts on health and safety

Reduced pressure on healthcare infrastructure

The population decline related to the departure of the demobilized workers should result in a fall in pressure on the healthcare system, which might lead to an improvement of access to healthcare in the area provided that the structures continue to be maintained after the closure of the Project.

The magnitude of this impact is considered large and its receptors sensitivity high. Its significance is therefore major.

To reinforce this impact, during the Project lifetime, the Project will collaborate and support local authorities in their use of the LDF and their management of health infrastructure and services to ensure they are correctly maintained and managed at financial equilibrium.

The residual impact is considered major.

Deterioration in access to healthcare

The reduction in the public budgets dedicated to local development may result in a deterioration of the healthcare services due to a lack of upkeep and maintenance of the structures that would have been put in place throughout the Project. Further, the risk of impoverishment of households related to the closure of the Project will undoubtedly limit their possibilities of paying for healthcare expenses.

In parallel, due to a fall in demand for healthcare related to a potential population decline and to the impoverishment of households due to the demobilization of the workers and therefore the overall fall in demand in the area, the private healthcare centers might close their doors.

The magnitude of this impact is considered large and its receptors sensitivity high. The significance of the impact is therefore major.

To mitigate this impact, during the Project lifetime, the Project will collaborate and support local authorities in their use of the LDF and their management of health infrastructure and services to ensure they are correctly maintained and managed at financial equilibrium.

The residual impact is considered moderate.

Increase in risks in terms of safety of the populations

Following the Project's closure, the demobilized workers will find themselves without a job. It is possible that some of them return to performing traditional agricultural activities, particularly given that the land will have been reclaimed and returned to the communities. It is however likely that a lot of demobilized workers will remain in the area, particularly in the urban centers, without a job.

The deterioration of the economic situation of these people might cause an increase in risks in terms of the safety of the populations. Indeed, theft and petty crime might develop.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

Measures to mitigate this impact will seek to support economic diversification, reinvestment in land based subsistence activities and improving the employability of Project workers. The following measures will allow for mitigating this impact:

- to implement the Employment conditions and awareness management plan in particular with regard to the development of a retrenchment plan for all employees and the provision of English language training for non-English-speaking staff;
- to reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.3.7 Capacity-building and professional expertise in a globalized context*);
- to reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives as described :
  - promoting employment and training including through the provision of professional training courses and training on job-seeking;
  - promoting business development by supporting income generating activities;
  - promoting land based productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.); and
- to report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it.
- to carry out awareness-raising actions with the GAC workers and its subcontractors to fight against delinquency ahead of the closure of the Project; and
- to support the public authorities to ensure a good level of public security.

The residual impact will be minor.

Increase in road security

The population decline related to the departure of demobilized workers will probably lead to a reduction in road traffic. The risk of accidents might then reduce, particularly in the RA and around Tinguilinta.

The magnitude of this impact is low and its receptors sensitivity medium. Its significance is therefore moderate.

The following measures can be put in place during the operation activities and will allow for reinforcing this impact:

- to support the authorities in the maintenance and application of a highway code for the entire area (speed limits, sign boards, etc.); and
- to support the public authorities for the implementation of awareness-raising campaigns against road accidents, in collaboration with the national and international NGOs.

The residual impact will be major.

Table 15.59 Mine area - impacts of the project's local content on local socioeconomic context during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduced pressure on healthcare infrastructure	*Major*	- To reinforce this impact, during the Project lifetime, the Project will collaborate and support local authorities in their use of the LDF and their management of health infrastructure and services to ensure they are correctly maintained and managed at financial equilibrium.	*Major*
Deterioration in access to healthcare	*Major*		*Moderate*
Increase in risks in terms of safety of the populations	*Moderate*	- To carry out awareness-raising actions with the GAC workers and its subcontractors to fight against delinquency ahead of the closure of the Project. - To implement the Employment conditions and awareness management plan in particular with regard to the development of a retrenchment plan for all employees and the provision of English language training for non-English-speaking staff. - To reinforce before the end of the Project operations, the Project impact in terms of increased professional capacity of its employees by extending planned mitigations (see *Section 15.3.2.7, Professional capacity-building in a globalized context).* - To reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives : • promoting employment and training including through the provision of professional training courses and training on job-seeking; • promoting business development by supporting income generating activities; and • promoting land based productivity (e.g. through training, provision on of seeds, fertilizers and tools, etc.). - To report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it. - To support the public authorities to ensure a good level of public security.	*Minor*
Increase in road security	*Moderate*	- To support the authorities in the maintenance and application of a highway code for the entire area (speed limits, sign boards, etc.). - To support the public authorities to ensure a good level of public security.	*Major*

15.3.4.9 Impact on education

Reduced pressure on education infrastructure

It is possible, when the mine is closed, that households leave the area with their children. Consequently, the pressure on the education infrastructure will reduce provided that they continue to operate after the closure of the Project.

The magnitude of the impact is considered large and its receptors sensitivity medium. The significance of the impact is therefore major.

To reinforce this impact, during the Project lifetime, the Project will continue to collaborate and support local authorities in their use of the LDF and their management of education infrastructure and services to ensure they are correctly maintained and managed at financial equilibrium.

The residual impact will be major.

Deterioration of access to education

The Project's contributions to the local development budgets and through investments using own funds will disappear with the end of the activities. It is therefore possible that the quality of the infrastructure dedicated to education deteriorates. The number of pupils might also fall insofar as the poorest households will probably no longer have the means to send their children to school. Girls are particularly exposed to this impact.

In parallel, the private education structures might suffer from the departure of some households and from the potential impoverishment of the population. In the absence of a sufficient number of pupils, these structures might have to shut down.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

To mitigate this impact, during the Project lifetime, the Project will collaborate and support local authorities in their use of the LDF and their management of education infrastructure and services to ensure they are correctly maintained and managed at financial equilibrium.

The residual impact will be minor. These mitigation measures will allow for assuring that a maximum number of pupils have access to education over the long-term.

Table 15.60 Mine area - impacts of the project's local content on education during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduced pressure on education infrastructure	*Major*	- To collaborate and support local authorities in their use of the LDF and their management of education infrastructure and services to ensure they are correctly maintained and managed at financial equilibrium.	*Major*
Deterioration of access to education	*Moderate*		*Minor*

15.3.4.10 Impact on mobility, flows and transport

Deterioration of transport infrastructure

The Project's contributions to the local development budgets and the investments using Project funds intended for the construction and maintenance of transport infrastructure (roads, tracks, crossing points) and the potential putting in place of a public transport system will disappear when the Project closes. This may trigger deterioration in the quality of the transport infrastructure and mobility possibilities.

The magnitude of this impact is medium during the closure phase and its receptors sensitivity is medium. Its significance is therefore moderate.

To mitigate this impact, during the Project lifetime, the Project will collaborate and support local authorities in their use of the LDF and their transport infrastructure and services to ensure they are correctly maintained.

The residual impact will be minor insofar as the transport infrastructure might maintain a certain degree of quality.

Table 15.61 Mine area - impacts of the project's local content on mobility, flows and transport during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Deterioration of transport infrastructure	*Moderate*	- To collaborate and support local authorities in their use of the LDF and their transport infrastructure and services to ensure they are correctly maintained and managed and that staff and local population have the required skills for their future maintenance.	*Minor*

15.3.4.11 Impact on living conditions and the landscape

Reduction in noise pollution

The potential reduction in the number of vehicles related to the population decline will probably result in a reduction in the noise levels in Tinguilinta and the other settlements located on the edge of the road. Consequently, the population of these areas will no longer suffer from problems caused by too high levels of noise (problems with sleeping, stress, cardiovascular diseases, or even vibrations weakening homes).

The impact is of negligible magnitude and its receptors sensitivity minor. The impact therefore has negligible significance.

In order to reinforce this positive impact, the Project may support the competent local authorities during the operation phase so that the public and private transport service is maintained and operates correctly beyond the end of the Project.

The residual impact is negligible insofar as the noise pollution related to the increase in traffic generated by the migrations linked to the Project in the RA could almost disappear.

Table 15.62 Mine area - impacts of the project's local content on living conditions and landscape during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Noise pollution	*Negligible*	- To support local authorities from the operation phase in maintaining the public and private transport systems.	*Negligible*

16 PORT AREA

16.1 REVIEW OF BASELINE SENSITIVITIES

16.1.1 Introduction

This section on the conditions of the original state in the Port Area (PA) focuses on the useful information related to further understanding and characterization of the susceptible impacts involved in launching the GAC Project in this area. The sensitivity of the receptors (populations and communities) is evaluated for each socioeconomic theme covered. *Table 16.1* gives a summary of the review of baseline sensitivities in the MA whereas these are further detailed in sections below.

Table 16.1 Overview table of baseline sensitivities in the port area.

Thematic	Sensitivity	Description
Demography and social dynamics	Medium	The sensitivity related to the social dynamics in the Port Area (PA) is at a medium level. The social mix in the city is already quite large and the economy is based on port and mining activities from more than 50 years. Furthermore, the city of Kamsar is very heavily populated and access to basic services and lodging is already difficult.
Power, governance and civil society	Medium	Power, governance and civil society have a medium social sensitivity in the PA. Authorities have a strong legitimacy with the population. However, traditional authorities still have a key position both in urban areas and surroundings villages. Expectations regarding social impacts are high among the populations, but the local authorities are experienced in managing this type of issue since the arrival of other industries in the PA.
Land tenure	High	Land tenure is a problem that has an increased sensitivity in the city of Kamsar, where the population density and the lack of basic services in the peripheral quarters already pose a problem. In rural areas land tenure pose a significant economic issue for local communities.
Agriculture	High (Southern Port Area) Medium (Urban area)	The social sensitivity regarding the issue of agriculture in the port area is elevated for the inhabitants of the islands south of Kamsar, because a large part of their economy relies on local agriculture. The issue is at a medium sensitivity level for the urban area of Kamsar, where the economic activities are more diversified.
Consumption of natural resources	High	The social sensitivity regarding access to natural resources is high in the PA, since many households living in Kamsar and on the islands further to the south rely on fishing activities and wood harvesting. Water supply from surface water, traditional wells or support from companies is considered as a high priority in the area.
Local economic context (mining industry, commerce and services)	High	The social sensitivity regarding the mining, commerce and service industries is higher in the Kamsar area that has a large urban concentration where a large part of the population gets its revenue from these three sectors. Expectations generated by the start of the project are very high.

Thematic	Sensitivity	Description
Health and safety	High	The social sensitivity related to health and Safety is at high level. In the city of Kamsar, access to basic services is already problematic. The main fears include the consequences of flow of migrants into the area as well as the risk of accidents related to the activities of the Project.
Education	Medium	The social sensitivity of the problem of education is at a medium level, insofar as relatively diverse educational options are already present in the city.
Mobility, flows and transport	Medium	The problem of mobility reveals a high social sensitivity in the port area. Conditions of the boat traffic in the estuary and the rivers have a determining impact on the mobility of the population, their access to health care, education and finally to the commercialization of the local products.
Cultural heritage	High	The social sensitivity associated with cultural heritage is high for the local populations. However there are no cultural heritage sites in the direct vicinity of the physical footprint of the Project's future plants.
Living conditions and landscape	Medium	The social sensitivity of the problem of living conditions and landscape is medium in all phases of the Project. To the extent that Kamsar is already structured around CBG mining and port activities. In this respect, the project will increase the industrial vocation of the city.

16.1.2 Demography and social dynamics

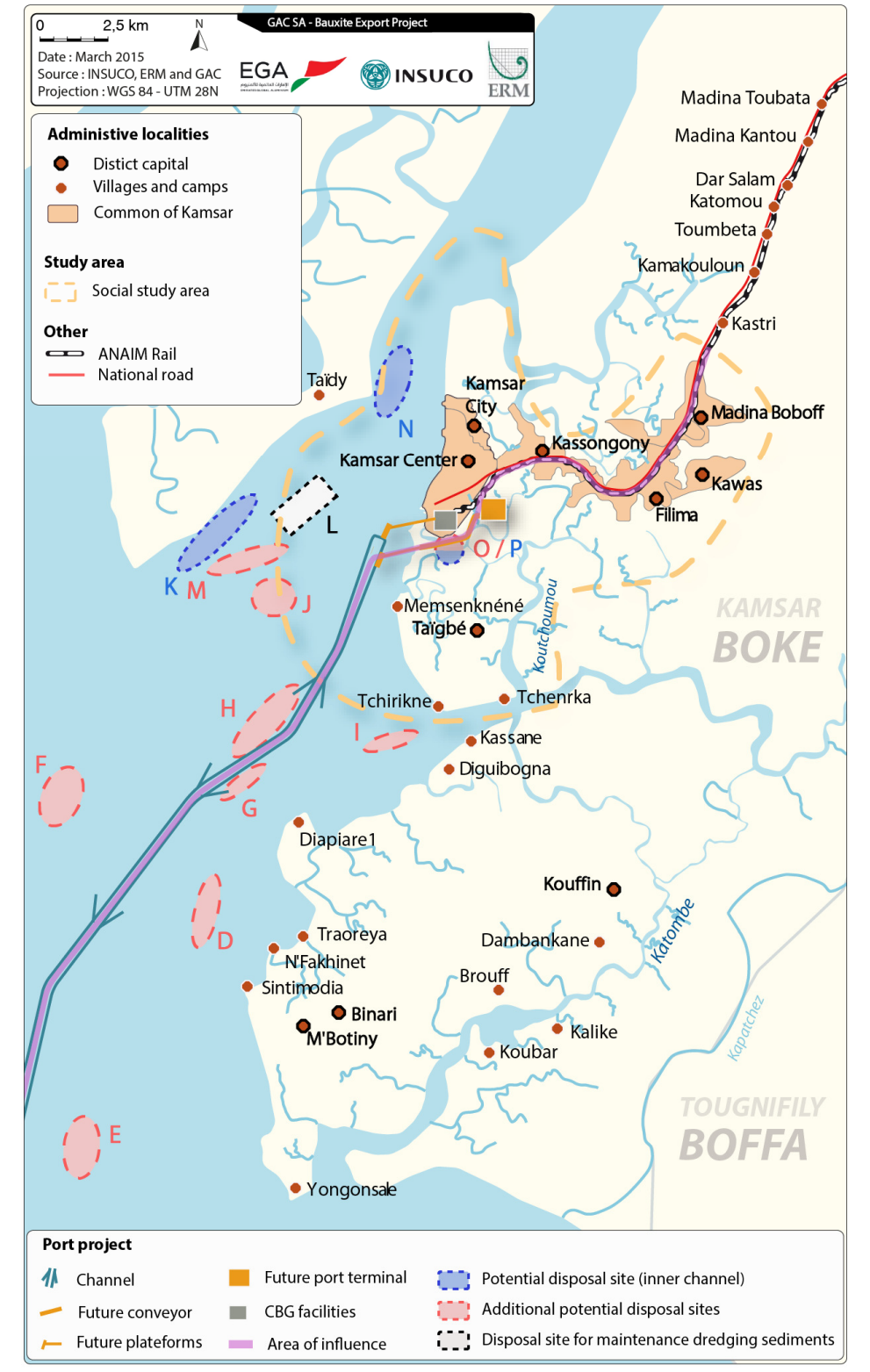
This former fishing settlement and its suburbs have grown since the industrial center operated by Compagnie des Bauxites de Guinée (CBG) was developed in the 1970s. The town houses the CBG's mining facilities: a processing facility for drying and crushing bauxite and a mining port. A rail line link the SP of Sangarédi (the bauxite mining area) to the port facilities. These facilities currently operated by CBG are owned by Agence Nationale d'Aménagement des Infrastructure Minières (ANAIM, a public industrial and commercial body).

The population of the Sub-Prefecture of Kamsar has exploded in the space of 40 years; it is in excess of 100,000 people according to the preliminary results of the 2014 census (République de Guinée, 2014). The town developed from the west to the east along the main street that links the town to the rest of Guinea, the main section is more than 10 km long today. The city center (the Kamsar Cité and the Kamsar Centre Districts), an area of dense population that allows for good access to basic services (education, health, water and electricity) and of a varying socioeconomic fabric, is distinguished from the outlying areas (the Kassongony, Filima, Kawas and Madina Borbof Districts) that act more as rural territory in transition.

In addition to the urban area, the PA extends southwards and toward the Districts of Taïgbé, Kouffin, Binari and M'botiny, islands with rural populations that are only accessible crossing several river branches by canoe.
The sensitivity related to the social dynamics in the Port Area (PA) is at a medium level. The social mix in the city is already quite large and the economy is based on port and mining activities from more than 50 years. Furthermore,

the city of Kamsar is very heavily populated and access to basic services and lodging is already difficult.

Figure 16.1 Port study area



The population of Kamsar is mainly young, reportedly with a third of inhabitants under the age of 9. The number of men is significantly higher than women, a phenomenon that is explained by the migration of single men coming to look for work (*See Socioeconomic Base Study*).

The population of the city of Kamsar is the result of a significant cultural mix of groups from Guinea and from bordering countries. The first inhabitants were the Baga and the Landouma, but the most widely spoken language is Susu (the language spoken in Conakry). In Taïgbé and in the more southern villages, the population is much more homogeneous, and is essentially made up of the Baga.

The sensitivity related to the social dynamics is at a medium level, to the extent that the social mix in the city is already quite large, due to the characteristic of a city in which the economy is based on port and mining activities from more than 50 years. Furthermore, the city of Kamsar is already very heavily populated and access to basic services and lodging is already difficult.

16.1.3 Power, governance and civil society

Kamsar is the most populated Sub-Prefecture in the Boké Prefecture. The authorities of the SP and Commune have a strong legitimacy with the population. Heads of districts are key figures of the local governance as they are continuously in touch with the local populations. In the urban area, traditional authorities still have a key position. Their legitimacy is even stronger in the villages surrounding Kamsar, and especially in those located to the south of the town, behind the future GAC facilities. Social tensions and conflicts in Kamsar are recurrent (and sometimes very violent) and almost systematically related to the access to water and electricity (provided for free but on an uneven basis by CBG) in central and suburban areas. A large number of regional and national NGOs and organizations have an agency or their head office in town.

Power, governance and civil society have a medium social sensitivity in the PA. Expectations regarding social impacts are high among the populations, but the local authorities are experienced in managing this type of issue since the arrival of the CBG

16.1.4 Land tenure

The town of Kamsar is densely populated. Land pressure is significant with a growing gradient from the suburbs to the center. Opportunities to purchase plots of land are very limited and associated costs are significant since all the inhabitants wish to live in central districts so as to have access to water and power networks.

The villages located to the south of the future port facilities are mainly rural. Their economy heavily relies on Mangrove rice cultivation and fishing. Accessibility to the plots of land located on both sides of the new conveyor system, and to the rivers and the estuary is a significant economic issue.

Land tenure is a problem that has an increased sensitivity in the city of Kamsar, where the population density and the lack of basic services in the peripheral quarters already poses a problem.

16.1.5 Agriculture

Mangrove rice cultivation is one of the main activities of the populations living to the south of Kamsar, beyond the river Dougoufissa (Districts of Taïgbé, Kouffin, Binari and M'botiny). Many rice cultivation units are developed and cultivated each year on the Taïgbé Island, mainly in the place known as Kassoussou, right to the south of the physical footprint of the future Project conveyor system (see *Figure 14.3*). Mangrove rice cultivation significantly differs from rain-fed rice cultivation practiced in the rest of Guinea. Plots are surrounded by small bunds used to bring in or discharge water.

These units are interspersed with areas used for the production of salt, an activity undertaken during the dry season, following rice harvesting and that is also significant in terms of money income for the people living on the southern islands.

The populations living on the southern islands and in the Kamsar suburbs are also engaged in market gardening and horticulture for commercial and subsistence purposes. These activities mainly involve inhabitants of Kamsar, in the area nestled between the CBG facilities and the future GAC conveyor system, where mango trees, banana trees, cassava and maize fields or market gardens are located. Cashew and palm trees for oil are key perennial crops on the Taïgbé Island.

Small ruminant and pig breeding is practiced by some people living in the villages located on the islands to the south of the SP, mainly for self-consumption. Livestock breeding is virtually nonexistent on the islands. Given the distance between the villages and the Project's coverage area, impacts on breeding activities will be negligible.

The social sensitivity regarding the issue of agriculture in the port area is elevated for the inhabitants of the islands south of Kamsar, because a large part of their economy relies on access to the rice fields and the salt-production areas. The issue is at a medium sensitivity level for the urban area of Kamsar, where the economic activities are more diversified.

16.1.6 Consumption of natural resources

16.1.6.1 Surface water

In Kamsar, the population depends both on CBG, HPP and traditional wells for drinking and sanitary water. Access to drinking water (network) is a high priority for the suburban population.

On the southern islands, water supply is mainly abstracted from surface water and traditional wells dug by the population. However, CBG set up a network

running to the settlement of Taïgbé. It crosses the river Dougoufissa at the location of the future conveyor system.

16.1.6.2 Fishing

In addition to the mining sector, the economy in the Kamsar SP is mainly focused on fishing, organized around an artisanal sector and a semi-industrial sector.

The activity is a source of income for both fishermen and the many women involved in fish processing (drying, smoking) and their commercialization. Two main ports, Fory and Néné concentrate the fishing, processing (smoked fish), transport and trading activities *(Figure 16.2*).

Port Néné is one of the largest fish landing areas on the Guinean coast. Infrastructure is well developed there: berth, ice plant, cold rooms, fuel depot, smokehouses, workshops, etc. Nearly 400 small motor boats and 1,600 fishermen move around the port. Fishing both takes place in inlets and the Rio Nuñez estuary, and on the coastline and open sea, depending on the season and weather conditions. Most catches are smoked and sold (activities involving some 200 women). Only a small quantity of fish is sold fresh. The largest quantities are exported to the rest of the country and neighboring countries.

Systematic incursions by industrial trawlers into coastal areas and water quality degraded by urban discharges are among the concerns voiced by industry stakeholders.

On the islands located to the south of the Project's future plants, a large number of fishing camps can be encountered. Fishing is more artisanal, fishermen virtually have no motor boats and investment in improvements is minor. Fishermen who more often settled in camps on the edges of the estuary mainly fish in the coastal areas and rivers meandering in the mangrove. Catches are intended for self-consumption and surpluses are smoked by women and sold on the local market and seldom to the organizations in charge of exporting fish to the rest of the country and neighboring countries.

Fishermen from the southern islands seldom dock and sell their catches at Port Néné. Commercial transactions mainly take place at the canoe landing stage on the river Dougoufissa for the inhabitants of Taïgbé, sometimes on the N'sara market in the heart of town. Outside of the inhabitants of the Falaba, Kaloum (Taïgbé District) and Kandouma (Kouffin District) sectors, that can go directly to the small port of Bendougou then by land just to the District and the daily market of Filma (see *Figure 16.2)*, all of the other inhabitants of the Southern Islands depend of the Port of Salamaya for the transport and the commercialization of their products. This port is located near the future rail spur, between the CBG and GAC facilities.

16.1.6.3 Other activities

Hunting and gathering activities seem to be fairly limited on the islands and in Kamsar. However, there is an issue regarding wood harvesting, especially mangrove-sourced wood used for domestic activities (cooking) and for two of the main economic activities of the area: fish smoking and salt production. On the Taïgbé Island, the closest to Kamsar, it seems that wood is now only harvested for local salt production and individual uses. By contrast, on the islands located further to the south, mangrove wood harvesting is a significant source of income. Wood harvested there (firewood and timber used in carpentry and to make boats) is mainly sold at the Salamaya port.

The social sensitivity regarding access to natural resources is high in the PA, since many households living in Kamsar and on the islands further to the south rely on fishing activities.

16.1.7 Local economic context (mining industry, commerce and services)

The city of Kamsar is developed around the CBG project. This company is the main employer (salaried work) in the port area. The expectations concerning hiring in the framework of the GAC Project are thus very high because many people living in Kamsar are competent in the skills required by the Project. Many businesses subcontracting the CBG Project have prospered in the port area.

The city of Kamsar is already very developed in the commerce and service activities.

The settlements located to the south of port facilities have economies that depend little or not at all on the mining industries, service and commerce (outside of the sale of their own products - fishing, salt, rice, palm oil, wood, etc.).

The social sensitivity regarding the mining, commerce and service industries is higher in the Kamsar area that has a large urban concentration where a large part of the population gets its revenue from these three sectors. Expectations generated by the start of the project are very high.

16.1.8 Health and safety

Healthcare facilities are quite common in Kamsar. There is one hospital, one healthcare center and 17 private medical centers. However, access to healthcare is unequal and varies depending on the socioeconomic level of the population.

The public hospital in Kamsar is financed by the CBG. It is renowned in the region for its quality of service. Appointments and care are free for permanent CBG employees, their families have also access to medical care.

There are only rudimentary healthcare centers in the capitals of the districts south of the SP. They are frequented by the population only for primary care. In

the case of a serious problem or a night-time emergency, the inhabitants of the island must come into the city.

The main diseases affecting the local populations are malaria, diarrhea, tuberculosis, tetanus and respiratory diseases (asthma, bronchitis). The challenges regarding HIV/Aids and other sexually transmitted infections are also quite high in the Kamsar area: it being a mining and port area, it attracts many single men, which results in the existence of many STD risk factors (high-risk behaviors).

As far as safety issues are concerned, social conflicts between the population and police forces regularly break out regarding water and power supply issues in the central districts of Kamsar.

The sensitivity of the local populations as regards problems related to health and safety is high. In the city of Kamsar, access to basic services are already problematic given the continued increase in the demand versus the supply of healthcare and to the problems of the elevated cost of access to these services in relation to household means.

The main fears expressed are associated with the consequences of additional flow of migrants into the area as well as the risk of accidents related to the activities of the Project (specifically the industrial run-off in the natural water used to irrigate the rice fields areas devoted to fishing).

16.1.9 Education

In the Kamsar Sub-Prefecture, the literacy rate remains low, with the rates being at 33% on average for women and 55% for men (*Knight Piésold Consulting, Executive Summary, 2008*).

In Kamsar, as in any other town in the country, education is both public and private. Teaching and learning conditions in private schools are generally better than in public schools (number of pupils per classroom), however the costs to be incurred by families are often steep, given their income level and number of children per household. There are some 50 primary schools and 15 secondary schools.

Public primary school is available in the settlement of Taïgbé and some villages further to the south. Conversely, pupils going to secondary school who are not living in Kamsar have to walk and take the canoe on the river Dougoufissa morning and evening.

The closest higher education institutes are located in Boké: the vocational training center, the community healthcare training school, primary school, teachers training school and higher institute of mines and geology (financially supported by CBG with its own funds).

The social sensitivity of the problem of education is at a medium level, insofar as relatively diverse educational options are already present in the city.

However, these options may become fewer in the years to come given the summary conditions that are offered to students is already too numerous in regards to the public school as in the private.

16.1.10 Mobility, flows and transport

The town of Kamsar is connected with the rest of the country through an asphalt road in very good condition. Port Fory, the fishing port of the town before Port Néné was created, is now dedicated to transport activities. About a hundred vessels transport passengers and goods between the coastal towns of Guinea and neighboring countries (Senegal, Gambia, Guinea-Bissau, Sierra Leone, etc.).

Most people living on the Taïgbé Island directly walk (or cycle) to Kamsar, taking the ferry that crosses the river Dougoufissa at the location of the future conveyor system. Then, they have to follow a track between the CBG plant and the future Project port facilities. Carriers (cars and motorcycles) sometimes meet people coming from the island at the ferry berthing area. Collectors also go there to buy products from the islands (rice, smoked fish, salt, varied crops). People living in the sectors of Falaba, Kaloum (Taïgbé District) and Kandouma (Kouffin District) go by boat to the small port of Bendougou and by land to Kamsar, via the Filima District.

The other people living in the southern islands (Kouffin, Binari and M'botiny Districts) rely on the Salamaya port to travel from and to Kamsar, as well as to transport local products to be sold: rice, fishery products, salt, varied crops, firewood and timber. The port is a small undeveloped pier where fishing and transport boats berth at high tide. It receives a dozen vessels including 6 for the transport of passengers (100 to 150 passengers per crossing), 14 for goods and 18 only for wood. There are also around 30 tradesmen negotiating the prices of the goods brought by the populations of the southern islands and a boat making workshop. The location of the Salamaya port is strategic because it is very close to the main market in Kamsar (N'sara market) and town center. It is however cut off by the ANAIM railway.

Figure 16.2 *Flow of goods and people in Kamsar and in the southern districts of the sub-prefecture*



The problem of mobility, flow and transport reveal an elevated social sensitivity in the port area, in that the conditions of the boat traffic in the estuary and the rivers have a determining impact on the mobility of the population, their access to health care, education and finally to the commercialization of the local products.

16.1.11 Cultural heritage

No new inventory of cultural heritage sites was carried out in the Port Area following the Resettlement Plan implemented in 2005 and 2006 by the Project. According to consultations with the Taïgbé authorities, no significant site is reportedly located in the direct vicinity of the physical footprint of the Project's future plants. The closest site would be the genies residences in the place known as Kassoussou, more than 100 m from the future conveyor system.

As anywhere else in Guinea, the social sensitivity associated with cultural heritage is high for the local populations.

16.1.12 Living conditions and landscape

The PA encompasses the Kamsar urban area, the CBG industrial complex, the Rio Nuñez estuary as well as mangrove areas, rice-growing and salt-producing areas and agroforestry areas around fishing camps and villages located on the islands to the south of the future Project facilities. The landscape and living environment are therefore diversified.

The social sensitivity of the problem of living conditions and landscape is medium in all phases of the Project. To the extent that Kamsar is already structured around CBG mining and port activities, the impacts of the Project on living conditions and landscape increase the industrial vocation of the city in terms of living conditions and landscape.

Contrary to the mine area, the entirety of the port area impacts will be addressed for each phase in the same section. Essentially, the potential impacts related to the physical influence of the Project in the PA are much more limited than in the MA, since the near totality of the future spatial imprint of the Project's facilities at the port level have already been implemented according to the Resettlement Plan in 2005 and 2006. The impacts related to the physical influence of the Project and those related to the local economic conditions have thus been regrouped.

16.2 SOCIOECONOMIC IMPACTS

16.2.1 Introduction

This part specifically deals with impacts related to the Project's direct contribution to the development of the local economy during the different activities' phases and the changes in the socioeconomic dynamic it induces - creation of jobs, migration flows, increase in budgets dedicated to local

development. It is unlikely that households will experience physical or economic displacement form the Project footprint at the PA. However the likelihood of such displacement impacts and the potential need for resettlement and livelihood restoration are presented in *Section 14.6*.

Overarching social mitigation measures used to mitigate potential social impacts from the Project are mentioned in *Section 14.5* above. These measures are:

- Resettlement and livelihood restoration
- Stakeholder Engagement
- Grievance Procedure
- Local Development Plan
- Code of business conduct
- Influx management
- Closure and rehabilitation

These measures are applicable to most social impacts arising from the Project and therefore will not be further developed for each of the impacts assessed below although they participate in their attenuation. Wherever these measures are considered relevant to mitigate these impacts they will be mentioned in the overview table of each Project residual impact.

16.2.2 Construction phase

16.2.2.1 Sources of impact

The sources of social impact of the Project on the MA during the construction phase are the following:

- construction of new port facilities on GAC's existing port platform;
- creating of direct jobs by the Project to meet labor force needs;
- creation of indirect jobs by the Project's subcontractors;
- creation of induced jobs related to the Project's needs in terms of goods and services; and
- increase in public revenue related to the payment of the taxes paid by the Project to local and national authorities.

Various facilities and infrastructure will have to be developed as part of the construction phase, including:

- development of a rail spur from the ANAIM rail line;
- rail terminal;
- bauxite unloading and warehousing area;
- conveyor;
- docking jetty for the vessels;
- fuel depot and power station;
- water storage and processing area;
- merchandise stockpile area;

- worker lodging buildings;
- administrative buildings;
- car park for the vehicles and trucks; and
- mechanical workshops, etc.

Dredging operations are further envisioned in the existing channel that is borrowed by the vessels and the traffic there will increase (Panama and Capesize types of boats). Dredging sediments will be discarded on offshore sites undergoing study.

The existing road network will experience high levels of construction related truck movements.

Hazardous materials will be stored (mainly fuel and small quantities of maintenance chemicals).

More than 1,000 people will directly participate in the construction of Project infrastructure in the port area, with peaks estimated at about 2,000 people. Many of these workers will be temporary employees, and will consist principally of non- and semi-qualified employees.

16.2.2.2 Impacts on demographics and social dynamics

Increase in social tensions

With the commencement of the Project's construction activities in the PA, information concerning the potential creation on jobs will spread throughout the country, even in the sub-region, and potentially generate the arrival of new job seekers in Kamsar, specifically single men. They will add to the already growing population of Kamsar.

These new migration flows may cause existing tensions and social conflicts to be exacerbated, mainly revolving around access to basic infrastructure (healthcare, water, education, electricity) upon which pressure is already very high. Additionally, these new arrivals may cause an increase in high-risk practices (prostitution, theft, assaults, dangerous conduct, alcohol, drugs, sexual intercourses, etc.).

Access to work is also a recurring subject of contention within the working population of Kamsar, and the Project's recruitment policies may be at the source of these tensions, the people not being recruited feeling aggrieved.

The magnitude of this impact is considered medium, its receptors sensitivity high, and its significance major.

The following overarching mitigation measures will be implemented to mitigate the impact:

- ensure local preferential hiring is implemented so as to benefit to the Project resettled people and local communities in priority;
- support Local Authorities in the establishment of an influx management plan for the city of Kamsar to limit the demographic pressure on the central sections of Kamsar, due to the migrations related to the Project, in collaboration with the competent authorities;
- implement and fund development projects as part of the Local Development Plan with the objective to enhance economic opportunities and living conditions in the PA, in particular by:
    - implementing awareness programs by the specialized local or national NGOs to the community regarding the following subjects: dangers associated with prostitution and other risky behavior (STDs), teenage and/or unwanted pregnancies, consumption of drugs, etc.;
    - adopting a regular consultation and information policy of the communities potentially affected by the Project; and
    - initiating, using its own funds, infrastructure projects within the framework of the signature of the Local Development Agreement with the impacted communes.

The implementation of these mitigation measures will entail a moderate residual impact.

Table 16.2 Port area - impacts on demographics and social dynamics during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in social tensions	*Major*	- Support Local Authorities in establishing an influx management plan for the city of Kamsar to limit the demographic pressure on the central sections of Kamsar, due to the migrations related to the Project, in collaboration with the competent authorities; - To implement a preferential hiring and sourcing procedure in favor of local people. - Implement and fund development projects as part of the Local Development Plan with the objective to enhance economic opportunities and living conditions in the PA, in particular by: • implementing awareness programs by the specialized local or national NGOs to the community regarding the following subjects: dangers associated with prostitution and other risky behavior (STDs), teenage and/or unwanted pregnancies, consumption of drugs, etc.; • adopting a regular consultation and information policy of the communities potentially affected by the Project; and • initiating, using Project funds, infrastructure projects within the framework of the signature of the Local Development Agreement with the impacted communes.	*Moderate*

16.2.2.3 Impacts on power, governance and civil society

Strengthening of civil society

The civil society of Kamsar is already relatively developed (the presence of numerous professional and social vocation associations with both local and national remits). Launching the Project may coincide with a reinforcement of the activities of these associations that may, for example, spur campaigns in information, sensitization and development in the social domains (health, education, etc.).

Furthermore, the people who work for the Project may benefit from a strengthening of their professional skills. Project investment in the education sector of Kamsar may increase the quality of general education and professional training. This capacity-building would enable people to access knowledge of their rights and governance mechanisms.

The magnitude of this impact is considered low and its receptors sensitivity high. Its significance is therefore moderate.

The following overarching mitigation measures mentioned in *Section 14.5* will be implemented to mitigate the impact:

- implement and fund development projects as part of the Local Development Plan with the objective to improve access and quality of education in the area; and
- engage regularly with the associations and organizations of citizens as part of the Project Stakeholder Engagement Plan.

The residual impact will be moderate. In effect, the application of these measures may allow a large number of people to integrate into civil society.

Risks of tension between communities and local administrative authorities

The Project will contribute to the increase in the budget for local development of Kamsar communities through the regulatory release of various taxes and fees. CBG supplies free electricity and water to the inhabitants of the central districts, creating an expectation regarding GAC in supplying basic services. Local authorities may be taxed for poor management of funds dedicated to development, even of corruption, if the residents of Kamsar feel they have not been sufficiently benefited.

The SP of Kamsar and the commune furthermore risk being regularly solicited to manage the principal conflicts between the populations and the GAC business. The grievances may be emphasized by the level of knowledge the citizens of Kamsar have regarding their rights, that is higher than among the rural population of the PA. It may also be foreseen that the tensions and conflicts surrounding the problem of employment may arise, as well as attempts to withhold information on the part of the authorities, social pressures and corruption attempts.

Traditional governance, according to them, will be less impacted, because they have already undergone notable changes since the demographic explosion of Kamsar.

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a major significance.

The mitigation measures to avoid tensions between communities and authorities are the following:

- the use of an effective and transparent grievance management system and to report on this mechanism to the authorities in Kamsar and in the villages impacted by the Project's activities.
- involving the administrative authorities in regular information and collaboration meetings in order to keep them informed of the progress of the Project's activities;
- to implement the local development plan (LDP) based on the local development agreement (LDA) on a collaborative basis with the competent authorities and widely circulate information on this tool (LDA and LDF are the main tools and means to implement the LDP);
- to gather information on the possible factors of tensions and conflicts in the port area, identifying and implementing development projects (particularly the basic infrastructure) supported by GAC using their own funds;
- ensuring the transparency of the Project's participation in financing development activities, when using own funds or via the contribution to the public budgets;
- to participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes; and
- to support the local authorities in their communication steps related to expenses for the local development.

The residual impact is considered moderate. Implementing these measures, in effect, would allow the development of tensions and conflicts to be anticipated upstream.

Increase in the risk of poor financial management

The financial volumes managed by the local authorities will significantly increase through the Project's regulatory contributions to the budgets of the local communities. It is possible that corruption and embezzlement practices may develop.

This impact will have a medium magnitude and receptors have high sensitivity. It is therefore considered as being of major significance.

The following measures would allow for mitigating the risks of corruption:

- to ensure the transparency of the Project's contributions to the budget of the local communities;

- to support the local authorities in their communication steps related to expenses for the local development;
- to rely on the LDA that would involve a principle of transparency and consultation associated with it and made accessible to the local community (Article 130 of the Mining Code 2013);
- to put into place a transparent hiring policy;
- to put into place an information campaign on the Project for all categories of the population: authorities, sub-prefectorals, communals, districts, sectors, traditional and village authorities;
- to favor methods of communication that can reach the majority of the stakeholders (radio broadcasting for example); and
- to comply with the legal obligation of putting in place a corruption monitoring plan.

The residual impact is considered moderate. These mitigation measures will limit the risks of corruption allowing more people to benefit from the funds allocated by the Project. The regular information of all stakeholders could also mitigate their sensitivity to this problem.

Table 16.3 Port area - impacts on powers, governance and civil society during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Strengthening of civil society	*Minor*	- Implement and fund development projects as part of the Local Development Plan with the objective to improve access and quality of education in the area - Engage regularly with the associations and organizations of citizens as part of the Project Stakeholder Engagement Plan	*Moderate*
Risks of tension between communities and local administrative authorities	*Major*	- The establishment of an effective and transparent grievance mechanism and to report on this mechanism to the authorities in Kamsar and in the villages impacted by the Project's activities - Involving the administrative authorities in regular information and collaboration meetings in order to keep them informed of the progress of the Project's activities - To implement the local development plan (LDP) based on the local development agreement (LDA) on a collaborative basis with the competent authorities and widely circulate information on this tool - To gather information on the possible factors of tensions and conflicts in the port area, identifying and implementing development projects (particularly the basic infrastructure) supported by GAC using their own funds - Ensuring the transparency of the Project's participation in financing development activities, when using own funds or via the contribution to the public budgets - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes - To support the local authorities in their communication steps related to expenses for the local development	*Moderate*
Increase in risks of corruption	*Major*	- Ensure the transparency of the project's contributions to the budget of the local communities - Support the local authorities in their communication steps related to expenses for the local development - To rely on the LDA that would involve a principle of transparency and consultation associated with it and made accessible to the local community (Article 130 of the Mining Code 2013) - Put into place a transparent hiring policy - Put into place an information campaign on the project for all categories of the population: authorities, sub-prefectorals, communals, districts, sectors, traditional and village authorities - Favor methods of communication that can reach the majority of the stakeholders (radio broadcasting for example). - Comply with the legal obligation of putting in place a corruption monitoring plan.	*Moderate*

16.2.2.4 Impacts on land use

Increase in tensions on the land resource

Tensions may arise regarding possible displacement and re-installation of populations that live in the area of the future rail spur, as well as those that will be installed in the future residential complex in the framework of the Project. The habitation area near the future branch of the rail in Kamsar is strategic, owing to its central position (proximity to the city center of Kamsar, with plenty of basic infrastructure and the N'sara market).

Furthermore, the rapid flow of migrants attracted by the opportunities for jobs will increase the pressure regarding land use and inflation (the cost of land, rent) in the city of Kamsar.

The magnitude of this impact is considered low in and its receptors sensitivity high. The significance is therefore moderate.

The proposed mitigation measures to attenuate the significance of this impact are the following:

- support Local Authorities in developing and implementing an Influx management plan following measures described in *Section 14.6* in particular by:
  - directing displaced persons in the case of re-installation towards welcome centers that offer the same opportunities as the land requisitioned by the Project, especially in terms of accessibility to basic infrastructure;
  - working with the local authorities to adequately prepare facilities for new migrants (division of plots in the peripheral areas of the city which has sufficient infrastructure); and
  - use the grievance mechanism as an overarching mitigation measures, that is widely known by the local authorities and runs effectively and transparently.
- help securing the land rights of the displaced persons in their place of resettlement; and
- optimize the future construction plans in order to minimize use of residential sites (particularly, the rail spur area).

The implementation of these mitigation measures will entail a moderate residual impact.

Table 16.4 Port area - impacts on land use during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in tensions on the land resource	*Moderate*	- Support Local Authorities in developing and implementing an Influx management plan following measures described in *Section 14.6* in particular by: • directing displaced persons in the case of re-installation towards welcome centers that offer the same opportunities as the land requisitioned by the Project, especially in terms of accessibility to basic infrastructure; • working with the local authorities to adequately prepare facilities for new migrants (division of plots in the peripheral areas of the city which has sufficient infrastructure); and • use the grievance mechanism as an overarching mitigation measures, that is widely known by the local authorities and runs effectively and transparently. - Help securing the land rights of the displayed persons in their place of resettlement. - Optimize the future construction plans in order to minimize the coverage on the residential sites (particularly, the rail spur area).	*Moderate*

16.2.2.5 Impact on agriculture

Fall in household income

The construction work near the port may have an impact on agricultural land situated in direct proximity to future facilities. Of particular note is the little agricultural area located between the future conveyor and the CBG plant to the east of these, and the rice paddies along the future conveyor on Taïgbé Island. The work may product a lot of dust that could have an impact on yields. However, dust can be already found in the surroundings as stated in the environmental baseline (see *Section 6.2*). It is also probable that access to these areas may be restricted for security reasons during this work.

Therefore, a noticeable loss of revenues for households that practice agricultural activities on this land is anticipated.

This impact will have a low magnitude and receptors have high sensitivity. The significance of the impact will therefore be moderate.

Implementing the Local Development Plan as an overarching mitigation measures mentioned in *Section 14.6* is expected to mitigate this impact, in particular by:

- allowing for financial compensation for possible interruption of activities during the work phase;
- implementing programs in support of agricultural development (technical courses, provision of equipment and inputs, , etc.) for the affected populations; and
- implementing economic diversification projects and favor the development of alternative income-generating activities, particularly for women (support to the transformation and selling of farm produce, specifically).

The implementation of these mitigation measures will entail a minor residual impact during the construction phase. These mitigation measures will limit the loss of revenue. The significance of the impact will therefore be mitigated.

Table 16.5 Port area - impacts on land use during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Fall in household income	*Moderate*	- Implementing the Local Development Plan as an overarching measures is expected to mitigate this impact, in particular by: • allowing for financial compensation for possible interruption of activities during the work phase; • implementing programs in support of agricultural development (technical courses, provision of equipment and inputs, etc.) for the affected populations; and • Implementing economic diversification projects and favor the development of alternative income-generating activities, particularly for women (support to the transformation and selling of farm produce, specifically).	*Minor*

16.2.2.6 Impacts on fishing and access to natural resources

Degradation of the quality of surface water and pressure on the resource

The pressure on water availability in the city of Kamsar may increase following an influx of migrants. The Project itself may have little impact on the existing network insofar as GAC is studying the possibility of supplying from a desalination process of estuary water.

Surface water is directly used in the settlements of the PA (south of the Project's coverage area) for household consumption, hygiene, dish washing and irrigation of yields (rice paddy flooding).

The risk of accident and of discharge of wastewater effluents (of fuel spill) during the construction work as well as the possible deposit of dust in the rivers near the plants (Dougouffissa, Koutchoumou) may degrade the resource.

This impact will have a low magnitude during the construction phase throughout the PA but high sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to construct additional and improved water supply infrastructure in residential areas and areas not served by the existing water distribution system, as well as where migrants have settled (peripheral areas);
- to limit as much as possible the sources of atmospheric pollution, to put measures in place to limit the emissions of dust during the works; and
- to undertake measures to prevent accidents and the risk of discharging effluents in the natural setting and minimize as much as possible the cause of these dangers.

The implementation of these mitigation measures will entail a minor residual impact during the construction phase. The mitigation measures will in fact allow for reducing the significance of the impact by preserving the access to good quality water for a large number of people.

Reduction in fishing

Launching the construction work in the port may have a significant impact on fishing activities in the Rio Nuñez estuary.

Dredging activities in the channel and infrastructure construction operations, specifically the jetty and the conveyor, may have an impact on fishing boat traffic, with consequences on the fishermen's mobility and thus their access to fish stocks. The amount of disruptions is however relative given the size of the whole area and also because fishermen rarely frequent the mouth of the Dougoufissa river because of its proximity to CBG's processing facility.

Dredging operations are however susceptible to disturb locally the estuary's ecosystem (specifically, the generation of noise under water) and change the availability of fish stocks.

Construction operations may additionally cause an increase in the risk of l accidents regarding discharge of wastewater effluents in the natural environment, as well as noise and dust that may be generated by various construction work (excavation / backfilling) and construction machinery. In short, the launching of works may contribute to the degradation in the quality of surface water with consequences on the availability of fish stocks in the estuary.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- adopt measures within the framework of the Stakeholder Engagement plan (SEP) as an overarching mitigation measures is expected to mitigate this impact, in particular by:
  - informing the fishermen of the area upstream of operations in order to limit the impact of the Project on the mobility of fishermen in the estuary;
  - to establish in collaboration with Port Authorities a boat traffic plan for construction and dredging work in the estuary, and to share with the affected populations;
- to undertake measures to prevent accidents and the risk of discharging effluents in the natural setting and minimize as much as possible the cause of these dangers; and
- to apply the mitigation measures proposed in the environmental impact study (the biological part regarding fish stocks).

The implementation of these mitigation measures will have a residual minor impact during the construction phase limiting both the risk of accidents for the fishermen and the decrease in fish stocks.

Table 16.6 Port area - impacts on fishing and access to natural resources during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Degradation of the quality of surface water and pressure on the resource	*Moderate*	- To construct improved water sources (type, location, number of works, functioning conditions, and undertake to choose them in conjunction with local populations) in proximity of habitation areas and those not served by the existing water distribution system, as well as in the welcome sections of the migrant populations (peripheral areas); - To limit to the maximum amount possible the sources of atmospheric pollution. - To undertake measures to prevent accidents and the risk of discharging effluents in the natural setting and minimize as much as possible the cause of these dangers. - Adopt measures within the framework of the Stakeholder Engagement plan (SEP) as an overarching measures is expected to mitigate this impact, in particular by: • Informing the fishermen of the area upstream of operations in order to limit the impact of the Project on the mobility of fishermen in the estuary; • To establish in collaboration with Port Authorities a boat traffic plan involved for construction and dredging work in the estuary, and to share with the affected populations. - To undertake measures to prevent accidents and the risk of discharging effluents in the natural setting and minimize as much as possible the cause of these dangers. - To apply the mitigation measures proposed in the environmental impact study (the biological part regarding fish stocks).	*Minor*
Reduction in fishing	*Moderate*		*Minor*

16.2.2.7 Impacts on the local socioeconomic context

Improvement in the economic situation of recruited persons and of their households

The Project estimates the creation of about 1,000 direct jobs in the construction phase of the port area. The people recruited by the Project and its sub-contractors will benefit from fixed and secure monthly revenue, however they will be short-term in nature. The number of permanent direct jobs from the construction phase will be more limited. In addition, the jobs offered by sub-contractors may be associated with less advantageous conditions for their employees (in respect of work norms, salary level, social protection, etc.).

Consequently, the impact will have a low magnitude but very high sensitivity. Its significance would therefore be major.

The overarching mitigation measures of local preferential hiring will be implemented to mitigate the impact by:

- to undertake a local recruitment policy (see details in *Section 16.2.2.2*);
- to promote job sustainability;
- to ensure decent salary conditions for the employees; and
- to ensure, both under agreements signed with subcontracting companies and in practices in the field, that the commitments GAC has made in favor of employees and the communities impacted are respected by all Project's stakeholders (random checks might be put in place to check the working conditions in the subcontracting companies of the Project).

The residual positive impact is considered major insofar as these measures will guarantee a situation that is financially and humanly acceptable to the persons recruited by the Project.

Increase in demand, economic diversification and reinforcement of local entrepreneurship

From the construction phase, the expected sizable and rapid arrival of migrants looking for work may contribute to economic dynamism in the city, and markedly increase demand in various sectors (lodging, transportation, restaurants, retail trade, private healthcare services, education, artisanal trade, etc.). This phenomenon will be accentuated by the increase in the purchasing power of the households having found work on the Project. Economic development opportunities and diversification allow for the increased needs of the communities and the migrants in the study area to be met, in various sectors. Local entrepreneurship might have to develop to respond to this increase in requirements.

The requirements related to the Project (supply of materials, equipment, fresh produce, maintenance, security and construction services, etc.) might create work opportunities for local entrepreneurs. The mine will generate large contracts concerning purchasing equipment, as well as other goods and services. The experience of Kamsar businesses in the mining sector allows them

to more easily respond to the needs of the Project (understanding of the specificity of the requirements, satisfaction with the specific volumes or respecting the norms of quality and security). The smallest companies may additionally position themselves to ensure they are part of supplying services in civil engineering, supplying food, non-technical maintenance services, security services, maintaining buildings and facilities, general upkeep of vehicles, transportation of employees, etc.

The magnitude of this impact is considered medium and its receptors sensitivity medium. Its significance is therefore moderate.

To optimize this impact, the Project will ensure local preferential sourcing is implemented so as to benefit to local entrepreneurs and businesses at local, regional and national level, including through a capacity building program aiming at building local business competencies to meet the Project standards including quality, health and safety requirements imposed by the Mining Code 2013 (Article 30-II).

The residual impact could be moderate as the local companies should benefit from more work opportunities.

Capacity-building and professional expertise in a globalized context

The direct and indirect jobs at the port during the construction phase will allow people to improve their skills and their professional experience, through continuous training but also through one-off training on subjects such as the health, safety and environment standards. Working for the Project will also enable them to familiarize themselves with the working methods and requirements of a multinational company, help them to build their competitive capacities and their employability over the long-term.

The magnitude of this impact is considered medium insofar as few people will be concerned. Its sensitivity is considered high. Its significance is therefore major.

In order to reinforce this impact the Project will ensure employees are continuously trained on a series of topics:

- to support continuous training for the employees of the Project and their subcontractors; and
- to anticipate the short-term retraining for employees (professional training, training on job-seeking);.

The residual impact could be major. These improvement measures will contribute to capacity-building for all of the local workers.

Increase in local development initiatives

Public revenue from local administrations regarding the Kamsar SP and in general, the Boké Prefecture should increase due to royalties and taxes that the

Project will generate due to its mining activity, once the Project is launched. The payment of royalties and taxes is a legal requirement of the Guinean legislation for mining operations, and its partial redistribution at the local level is written in the Mining Code 2013 and embedded in the Mining Agreement between GAC and the GoG.

The Project may also invest its own funds towards community development upon the beginning of the construction phase (however, without legal obligation), and in fact, has already started (school, bridges and other infrastructure). These investments would participate more or less significantly in the socioeconomic impetus in the Project's area. They would particularly allow for developing the basic infrastructure and improving access to them (schools, healthcare centers, etc.).

Finally, the economic development of the area will lead to an increase in tax revenue that could allow the State to increase these public expenses.

The magnitude of this impact is considered medium and its receptors sensitivity medium. Its significance is therefore considered moderate.

The measures to optimize local development initiatives are:

- to increase the amount of the community investments using own funds;
- to involve the communities and local authorities during the construction of basic infrastructure or the implementation of development projects, in order to find out their specific needs (recording of investments within the framework of the Local Development Plan of the communes);
- to implement the local development plan (LDP) based on the local development agreement (LDA) on a collaborative basis with the competent authorities and widely circulate information on this tool;
- to establish a framework of collaboration with regular meetings (sub-prefectoral, communal and district authorities, GAC and representatives of the subcontracting companies);
- to participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes;
- to strive for transparency of the Project's contributions to the budget of the local institutions; and
- to support the local authorities in their communication steps related to expenses for the local development.

The residual impact will be of moderate significance. The improvement measures could take time to be formalized and during the construction phase, the amounts available will remain relatively low compared to those dedicated to local development in the operational phase.

Table 16.7 Port area - impacts on local socioeconomic context during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement in the economic situation of recruited persons and of their households	*Major*	- The overarching measures of local preferential hiring and measures mentioned in *Section 14.5*, will be implemented to mitigate the impact: • to pursue a local recruitment policy. • to favor the sustainability of the job. • to assure decent salary conditions for the employees; and • to ensure, both under agreements signed with subcontracting companies and in practices in the field, that the commitments GAC has made in favor of employees and the communities impacted are respected by all Project's stakeholders (random checks might be put in place to check the working conditions in the subcontracting companies of the Project).	*Major*
Increase in demand, economic diversification and reinforcement of local entrepreneurship	*Moderate*	- The Project will ensure local preferential sourcing is implemented so as to benefit to local entrepreneurs and businesses at local, regional and national level, including through a capacity building program aiming at building local business competencies to meet the Project standards including quality, health and safety requirements imposed by the Mining Code 2013 (Article 30-II).	*Moderate*
Capacity-building and professional expertise in a globalized context	*Major*	- In order to reinforce this impact the Project will ensure employees are continuously trained: • to support continuous training for the employees of the Project and their subcontractors; and • to anticipate the short-term retraining for employees (professional training, training on job-seeking)	*Major*
Increase in local development initiatives	*Moderate*	- To increase the amount of the community investments using own funds. - To involve the communities and local authorities during the construction of basic infrastructure or the implementation of development projects, in order to find out their specific needs (recording of investments within the framework of the Local Development Plan of the communes). - To implement the local development plan (LDP) based on the local development agreement (LDA) on a collaborative basis with the competent authorities and widely circulate information on this tool - To establish a framework of collaboration with regular meetings (sub-prefectoral, communal and district authorities, GAC and representatives of the subcontracting companies). - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes. - To ensure the transparency of the Project's contributions to the budget of the local institutions. - To support the local authorities in their communication steps related to expenses for the local development.	*Moderate*

16.2.2.8 Impacts on health and safety

Diseases related to water and sanitation

The natural population growth and the growth generated by the influx will cause increased pressure on the water resources and hygiene facilities in Kamsar.

Construction activities may also lead to increase in water-borne diseases: the risk of discharges of effluents or fuel spills and the possible deposit of dust in the river courses near the facilities (Dougoufissa, Koutchoumou) may have health consequences in the villages to the south not linked to the water flow system of the city. These negative effects on the water quality might in particular include diarrhea, parasitic diseases, typhoid fever and even gastroenteritis diseases. The most vulnerable populations would be children, the elderly, the sick and the pregnant women.

Additionally, the volume of waste may also increase, due to the arrival of migrants and construction activities may generate various wastes (industrial or not) that may have an impact on the hygiene conditions near the workers' construction and lodging sites. The health and hygiene conditions would therefore deteriorate in the city, leading to a risk of the expansion of diseases.

The magnitude of this impact is considered medium and its receptors sensitivity medium. The impact therefore has a moderate significance.

Some mitigation measures are common to all the impacts identified on the health and safety of workers and the communities. They are explained here and will not be repeated in the mitigation measures identified for other impacts related to health:

- to develop a Local Development Plan in particular with regard to the objective to improve local communities awareness on hygiene, health and communicable diseases and to improve access to health infrastructure and services;
- to evaluate the risks and the impacts on health and safety to which the affected communities are exposed and to take the appropriate prevention measures;
- to use work techniques and methods adapted to protect the environment, the safety of workers and the population living near the rivers;
- to develop a "Health, Safety and Hygiene Plan" in accordance with the Mining Code 2013;
- to design and construct the structural elements of the Project by taking account of the risks to which the workers and the affected communities are exposed;
- to reduce the potential exposure of the community to hazardous materials and substances;
- to consider resettlement when the technical measures available may not lower the level of pollution to an acceptable level;

- to inform the populations about construction sites and their duration and to inform on the risks associated with the activities of the Project;
- to financially support the construction of the healthcare infrastructure in the impacted settlements, in partnership with the government and the competent authorities;
- to support campaigns raising the awareness of the Project's workers and communities on health problems, in collaboration with national and/or international NGOs; and
- to use a grievance mechanism and ensure that this latter is known (information campaign), is transparent and is functional.

The following mitigation measures are specific to the risks related to water and sanitation:

- to support Local Authorities in developing and implementing an Influx management plan in particular by supporting the local authorities in managing migration flows and the associated urban planning: installation of hygiene infrastructure (particularly latrines) in public places, installation of improved water bodies (via investments using own funds or support to the competent authorities); and
- to develop a Local Development Plan in particular with regard to the objective to support the authorities and civil society to implement awareness-raising campaigns on hygiene.

Additional mitigation measures are:

- to reduce the production of hazardous and non-hazardous waste and eliminate it appropriately (residue, waste and hazardous materials' management strategy);
- to avoid or reduce and control the discharge of effluents in the environment (evaluate their production, transport, handling, stockpile and use); and
- to adopt anti-dust measures (truck traffic, scouring of land, sweeping and backfilling operations).

The implementation of these mitigation measures will entail a minor residual impact during the construction phase. These mitigation measures would prevent the problems related to health and hygiene, and therefore limit the source of impact.

Air quality

The dust generated by the construction work may lead to the emissions of:

- dust containing metals (including aluminum); and
- emissions of SO_2 and NO_2 (generators and mobile equipment).

This is assessed in detail in *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.

Noise

The levels of noise and vibrations associated with the movement of trucks and the construction activities of the Project in the surrounding areas of the building sites could be a factor of major stress for the populations living nearby, particularly at night.

This is assessed in detail in *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.

Diseases related to the displacement of populations

The concentration of around 1,000 workers (majority of them men) in one or several bases may have repercussion on the health of workers and river communities. It can be anticipated that the workers, having a regular income, may increase risky behavior (prostitution, consumption of drugs and alcohol, etc.), and that the rate of the prevalence of HIV/AIDS and other STDs will increase.

Furthermore, the population growth related to migrations, the overcrowding of residents and the general change in conditions and ways of life may favor the propagation of epidemics and diseases (Ebola, acute respiratory infections, tuberculosis, malaria, etc.).

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a major significance.

The planned overarching mitigation measures to mitigate the impacts are:

- to support Local Authorities in developing and implementing an Influx management plan in particular by:
  - supporting the local authorities in the management of migration flows and urban planning (housing in particular); and
  - initiating measures that would avoid population pressure- the Project will operate, for example, bus services to access the work sites in order to thin out the lodging areas for temporary workers.
- to develop a Local Development Plan in particular by:
  - promoting, as part of the initial training, the raising of the awareness of the Project's personnel on transmitted diseases (for example, tuberculosis) and sexually transmitted diseases (for example, HIV/AIDS), vector-borne diseases (for example, malaria) and other diseases as appropriate; and
  - organizing awareness-raising campaigns on public health problems with the communities in collaboration with national and international NGOs.
- to communicate and enforce the Code of business conduct in particular provisions related to workers communities, drug and alcohol consumption and interactions with local communities and the prohibition of illegal activities, including the use of sex workers and the consumption and/or the traffic of illegal substances.

Additional mitigation measures are:

- to establish a systematic medical inspection and a screening of workers at least once a year and to develop a healthcare adjustment plan (Article 143 of the Mining Code 2013);
- to design and administer the accommodation camps in accordance with international best practices on the accommodation of workers, particularly the criteria of the IFC; and
- to support the development of the healthcare infrastructure of the region through investment using own funds, by providing specific structures for viral diseases.

The residual impact will be moderate.

Risks to the safety of populations

An increase in the population of the city of Kamsar linked to migrations of job seekers may lead to an increase in social tensions and a general decrease in the conditions of public security. The increase in risky behavior induced by the arrival of single men might contribute towards a deterioration of the safety conditions of the local populations. The consumption of alcohol and drugs, or the increase in delinquency, may cause altercations in the communities.

The Kamsar authorities mentioned that the areas not supplied with electricity are considered being at risk at nightfall. They have also expressed concerns having seen an increase the number of clashes between the mining companies and the population concerning the degraded conditions of access to water and electricity (locally, the populations consider the free supply of services as compensation owed by the mining companies).

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

The following measures will allow for mitigating this impact:

- to carry out awareness-raising actions with GAC workers and its subcontractors on risky practices and the GAC policy on relations between workers and with the communities; and
- to support the public authorities for the implementation of awareness-raising campaigns on risky behavior, in collaboration with the national and international NGOs.

The residual impact will be considered moderate. These mitigation measures might in fact mitigate, as a preventative, the risks in terms of health and safety of the populations and render them negligible.

Risks for the security of workers

The start-up of the construction works of the process facility and other mining infrastructure in the PA might entail an increase in risks for the safety of workers:

- risks of injuries, accidents and diseases related to the carrying out of physical work (for the unqualified workers);
- risks of accidents in driving trucks;
- risks associated with the presence of noise, vibrations and dust;
- risks of accidents associated with tiredness (lack of attention) for the night-time workers; and
- risks of accidents associated with the handling of hazardous products or in case of one-off events (for example fires or leaks).

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned mitigation measures to mitigate the significance of this impact are:

- to establish a worker protection system against occupational diseases (screening of factors of harm, regular medical visits of the workers, etc.);
- to identify the potential dangers for the workers, particularly likely to constitute a threat for their lives;
- to initiate measures designed to prevent accidents, injuries and diseases resulting from the work by minimizing, as much as possible, the cause of such dangers;
- to safeguard the safety of the machines and equipment;
- to give workers the means to work safely;
- to develop a training program for the Project's workers (direct and indirect jobs) in order to ensure that these employees have the skills, information and capacities required to manage the risks associated with the job to which they are assigned;
- to provide the workers with all the protection equipment necessary to minimize the risks associated with the tasks carried out as part of their job; and
- to check compliance with the application of the aforementioned standards by the subcontractors of the Project, particularly by conducting regular audits and taking corrective measures if need be.

The implementation of these mitigation measures will entail a minor residual impact during the construction phase.

Improvement of health care services

The increase in budgets dedicated to local development from the construction phase should allow for the improvement of basic facilities related to hygiene and health (healthcare centers, latrines, potable water sources, etc.) in both quantitative and qualitative measures according to need. The quality of healthcare services may significantly improve for the inhabitants of the SP

(Kamsar city and the districts to the south). Additionally, it is probable that the increase in the demand in terms of healthcare and safely in Kamsar (related to the increase in population and the solvency of the Project's workers) will continue to contribute to the development of private healthcare systems.

The magnitude of this impact is considered medium and its receptors sensitivity high. The significance of the impact is therefore major.

In order to reinforce this positive impact, it will need:

- to maximize the amount of investments using Project funds in the healthcare sector;
- to involve the communities and local authorities during the construction of basic infrastructure or the implementation of development projects, in order to find out their specific needs (recording of investments within the framework of the Local Development Plan of the communes); and
- to develop a Local Development Plan on a collaborative basis with the competent authorities.

The residual impact is considered major as a higher number of people will be able to benefit from healthcare services.

Access to healthcare

The likely migration increase related to the arrival of job seekers may lead to an increase in the pressure on basic healthcare services in the city of Kamsar, and lead to a decrease in access to healthcare.

Additionally, the partial loss of income of certain households affected by the construction work (cultivators located near the future plants and people affected by the decrease in their work opportunities) may have an impact on the part of the budgets of these households dedicated to healthcare. In addition, the possible disruption in traffic flow between Taïgbé and Kamsar may make it more difficult for the populations of the islands to gain access to the healthcare infrastructure of Kamsar.

This impact will have a low magnitude during the construction phase, and its receptor a high sensitivity. The significance of the impact will therefore be moderate.

In order to optimize this impact, the planned overarching measures to improve access to health infrastructure and quality of services are:

- to support Local Authorities in developing and implementing an Influx management plan by :
  - anticipating the reinforcement of healthcare infrastructure in relation to the arrival of migrants.
- to develop and implement a Local Development Plan in particular by:
  - participating, in collaboration with the local administrative authorities (within the framework of a Local Development Plan), in the renovation of

public health infrastructure in the southern islands (materials, equipment and infrastructure); and
- providing for financial compensation or compensation in kind for the displaced households through the transition period to enable them to maintain the same financial capacity of access to healthcare.

Additional mitigation measures are:

- to put in place alternative solutions so as to not block the movement of locals from Taïgbé and the southern islands between the Dougoufissa river and the city of Kamsar; and
- to organize a crossing point above the railway track, so as not to hinder the movement of inhabitants living south of the future connection and particularly users of Salamaya port.

The implementation of these mitigation measures will have a minor residual impact during the construction phase as a larger number of people will benefit from healthcare services.

Road and maritime security

Dredging the Rio Nuñez may increase the risk of accidents between the boats of the Project and the fishermen's canoes in the area. The channel in which the mining vessels maneuver represents a danger for the fishermen of Kamsar's ports, the majority of the canoes do not have motors. Access to the channel is forbidden for fishing and passenger boats, however the inhabitants of the southern districts sometimes cross the channel with their boats heading to Port Fory or Port Néné, without it ending in an accident or admonishment from authorities to date.

The increased presence of work site machinery during the construction phase in the center of Kamsar may, additionally, lead to an increase in a risk of road accidents, just as the increase in traffic is linked to the increase in urban population.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to adopt a traffic management plan that avoids traffic during rush hour and road traffic code (speed limits, signs, signals at the entrance of sites, etc.);
- to prohibit the access of non-authorized persons to the work sites;
- to pay for the costs induced by road traffic accidents for which the Project's vehicles are proven liable;
- to support Port Authorities in creating and applying a maritime traffic code that takes into account the fishermen in the area, in collaboration with the competent local authorities; and

- to put a campaign in place to raise the awareness of the population on road and maritime safety issues; and
- to inform the authorities (specifically the port authorities) of the nature and agenda of the business work in the area of the estuary.

The implementation of these mitigation measures will entail a minor residual impact during the construction phase.

Table 16.8 Port area - impacts on health and security during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Mitigation measures common to all the impacts on health		- To evaluate the risks and the impacts on health and safety to which the affected communities are exposed and to take the appropriate prevention measures. - To use work techniques and methods adapted to protect the environment, the safety of workers and the population living near the rivers. - To develop a "Health, Safety and Hygiene Plan" in accordance with the Mining Code 2013, GAC's corporate policies as well as IFC PS2 and AfDB OS5. - To design and construct the structural elements of the Project by taking account of the risks to which the workers and the affected communities are exposed. - To reduce the potential exposure of the community to hazardous materials and substances. - To consider resettling when the technical measures available may not lower the level of pollution. - To inform the populations of the construction sites locations and their duration and to inform about the risks associated with the activities of the Project. - To financially support the construction of the healthcare infrastructure in the impacted settlements, in partnership with the government and the competent authorities. - To support campaigns raising the awareness of the Project's workers and communities on health problems, in collaboration with national and/or international NGOs. - To use a grievance mechanism and ensure that this latter is known (information campaign), is transparent and is functional.	
Diseases related to water and sanitation	*Moderate*	- To support Local Authorities in developing and implementing an Influx management plan in particular by supporting the local authorities in managing migration flows and the associated urban planning;, installation of hygiene infrastructure (particularly latrines) in public places, installation of improved water bodies (via investments using own funds or support to the competent authorities). - To develop a Local Development Plan in particular by supporting the authorities and civil society to implement awareness-raising campaigns on hygiene. - To reduce the production of hazardous and non-hazardous waste and eliminate it appropriately (residue, waste and hazardous materials' management strategy). - To avoid or reduce and control the discharge of effluents in the environment (evaluate their production, transport, handling, stockpile and use). - To adopt anti-dust measures (truck traffic, scouring of land, sweeping and backfilling operations).	*Minor*
Air quality		Refer to *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.	
Noise		Refer to *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.	
Diseases related to the	*Moderate*	- To support Local Authorities in developing and implementing an Influx management plan in particular by:	*Moderate*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
displacement of populations		• supporting the local authorities in the management of migration flows and urban planning (housing in particular); • initiating measures that would avoid population pressure- the Project will operate, for example, bus services to access the work sites in order to thin out the lodging areas for temporary workers; • supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration - To develop and implement a Local Development Plan in particular by: • promoting, as part of the initial training, the raising of the awareness of the Project's personnel on transmitted diseases (for example, tuberculosis) and sexually transmitted diseases (for example, HIV/AIDS), vector-borne diseases (for example, malaria) and other diseases as appropriate; and • organizing awareness-raising campaigns on public health problems with the communities in collaboration with national and international NGOs. - To communicate and enforce the Code of business conduct as described in particular provisions related to workers communities, drug and alcohol consumption and interactions with local communities and the prohibition of illegal activities, including the use of sex workers and the consumption and/or the traffic of illegal substances. - To explicitly prohibit any illegal activity carried out by all of the Project's personnel, including the use of sex workers, the sex trade and the consumption and/or the traffic of illegal substances. - To establish a systematic medical inspection and a screening of workers at least once a year and to develop a healthcare adjustment plan (Article 143 of the Mining Code 2013). - To design and administer the accommodation camps in accordance with international best practices on the accommodation of workers, particularly the criteria of the IFC. - To support the development of the healthcare infrastructure of the region through investment using own funds, by providing specific structures for viral diseases. - To carry out awareness-raising actions with GAC workers and its subcontractors on risky practices and the GAC policy on relations between workers and with the communities. - To support the public authorities for the implementation of awareness-raising campaigns on risky behavior, in collaboration with the national and international NGOs.	
Risks to the safety of populations	*Moderate*		*Moderate*
Risks for the security of workers	*Moderate*	- To establish a worker protection system against occupational diseases (screening of factors of harm, regular medical visits of the workers, etc.). - To identify the potential dangers for the workers, particularly likely to constitute a threat for their lives. - To initiate measures designed to prevent accidents, injuries and diseases resulting from the work by minimizing, as much as possible, the cause of such dangers. - To safeguard the safety of the machines and equipment. - To assure the ability to work of the workers (physical conditions). - To develop a training program for the Project's workers (direct and indirect jobs) in order to ensure	*Minor*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
		that these employees have the skills, information and capacities required to manage the risks associated with the job to which they are assigned. - To provide the workers with all the protection equipment necessary for the prevention of the risks associated with the tasks carried out as part of the job. - To check compliance with the application of the aforementioned standards by the subcontractors of the Project, particularly by conducting regular audits and taking corrective measures if need be.	
Improvement of health care services	*Major*	- To maximize the amount of investments using own funds in the healthcare sector. - To involve the communities and local authorities during the construction of basic infrastructure or the implementation of development projects, in order to find out their specific needs (recording of investments within the framework of the Local Development Plan of the communes). - To develop a Local Development Plan on a collaborative basis with the competent authorities.	*Major*
Access to healthcare	*Moderate*	- To support Local Authorities in developing and implementing an Influx management plan in particular by anticipating the reinforcement of healthcare infrastructure in relation to the arrival of migrants. - To develop a Local Development Plan in particular by: • participating, in collaboration with the local administrative authorities (within the framework of a Local Development Plan), in the renovation of public health infrastructure in the southern islands (materials, equipment and infrastructure); and • providing for financial compensation or compensation in kind for the displaced households through the transition period to enable them to maintain the same financial capacity of access to healthcare.	*Minor*
Road and maritime security	*Moderate*	- To put in place alternative solutions so as to not block the movement of locals from Taïgbé and the southern islands between the Dougoufissa River and the city of Kamsar. - To organize a crossing point above the railway track, so as not to hinder the movement of inhabitants living south of the future connection and particularly users of Salamaya port. - To adopt a traffic management plan that avoids traffic during rush hour and road traffic code (speed limits, signs, signals at the entrance of sites, etc.). - To prohibit the access of non-authorized persons to the building sites. - To pay for the costs from road traffic accidents for which the Project's vehicles are proven liable. - To support Port Authorities in creating and applying a maritime traffic code that takes into account the fishermen in the area, in collaboration with the competent local authorities. - To put a campaign in place to raise the awareness of the population on road and maritime safety issues. - To inform the authorities (specifically the port authorities) of the nature and agenda of the business work in the area of the estuary.	*Minor*

16.2.2.9 Impact on education

Improvement of education services

The Project's contributions to the local development budgets of local administrations and through investments using its own funds should be able to significantly improve access to education in the PA. These contributions could be able:

- to increase education services (primary, secondary, vocational and higher) - currently, there is no secondary education in the districts to the south of Kamsar; and
- to put in place literacy programs for everyone and youth training programs (technical or even of a higher level).

The magnitude of this impact is low and its receptors sensitivity medium. Its significance is therefore minor.

Therefore the Project will develop and implement of a Local Development Plan which one of the objective is to improve access and quality of education, including by:

- maximizing the investments using Project funds;
- developing in collaboration with the competent authorities (prefectoral, sub-prefectoral and local) a strategy for the development of the educational services in the area in accordance with the needs and capacities of the government to create teaching jobs (to take account of the school map when creating any new establishment);
- collaborating in the building of one or more colleges in the area in order to encourage the secondary education of young people (particularly girls whose parents refuse to educate in the town); and
- putting in place a study bursary program that would encourage parents to educate their children, particularly girls.

The residual positive impact will be moderate. These reinforcement measures would mean that a maximum number of persons will be able to benefit from improved access to education.

Access to education

The partial loss of income of certain households affected by the construction work (cultivators located near the future plants and people affected by the decrease in their work opportunities) may have an impact on the part of the budgets of these households dedicated to education. The possible disruption in traffic flow between Taïgbé and Kamsar may additionally make it more difficult for the populations of the islands to gain access to the secondary education infrastructure of Kamsar.

Finally, the population growth of Kamsar related to the arrival of migrants may cause an increase in the demand in the education sector and increase pressure

on the existing education infrastructure (however, this will be minimized by the fact that the majority of the migrants will be single men).

This impact will have a low magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be minor.

Therefore the Project will develop and implement a Local Development Plan which one of the objective is to improve access and quality of education, including by:

- increasing the investments using own funds in this domain;
- participating, in collaboration with the local administrative authorities, in the construction of a middle school in the Districts south of the SP (concerted approach within the framework of a Local Development Plan);
- providing for financial compensation or compensation in kind for the displaced households through the transition period to enable them to maintain the same financial capacity of access to education;
- putting in place a study bursary system for the pupils and students of the poorest households and for those living in particularly isolated areas and to consider a study bursary system in order to encourage the education of girls; and
- putting in place alternative solutions so as to not block the flow of locals from Taïgbé and the southern islands between the Dougoufissa river and the city of Kamsar.

The implementation of these mitigation measures will entail a negligible residual impact during the construction phase. These reinforcement measures would mean that a maximum number of persons will be able to benefit from improved access to education.

Table 16.9 Port area - impacts on education during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of education services	*Minor*	- To develop and implement a Local Development Plan which one of the objective is to improve access and quality of education, including by: • maximizing the investments using own funds in this domain; • developing in collaboration with the competent authorities (prefectoral, sub-prefectoral and local) a strategy for the development of the educational offer in the area in accordance with the needs and capacities of the government to create teacher jobs (to take account of the school map when creating any new establishment); • collaborating in the building of one or more colleges in the area in order to encourage the secondary education of young people (particularly girls whose parents refuse to educate in the town); and • putting put in place a study bursary program that would encourage parents to educate their children, particularly girls.	*Moderate*
Access to education	*Minor*	- To develop and implement a Local Development Plan which one of the objective is to improve access and quality of education, including by • increasing the investments using own funds in this domain; • participating, in collaboration with the local administrative authorities, in the construction of a middle school in the Districts south of the SP (concerted approach within the framework of a Local Development Plan); • providing for financial compensation or compensation in kind for the displaced households through the transition period to enable them to maintain the same financial capacity of access to education; • putting in place a study bursary system for the pupils and students of the poorest households and for those living in particularly isolated areas and Consider a study bursary system in order to encourage the education of girls; and • putting in place alternative solutions so as to not block the flow of locals from Taïgbé and the southern islands between the Dougoufissa river and the city of Kamsar.	*Negligible*

16.2.2.10 Impacts on mobility, flows and transport

Road congestion

Starting construction work may have a significant impact of the road facilities in the center of Kamsar and between the islands south of the city:

- the increased presence of work site trucks during the construction phase in the center of Kamsar may cause congestion on the roads of the city, that are already heavily used;
- access to the route that links Taïgbé and other localities to the south of Kamsar and that passes through the future conveyor may be disturbed by its construction; and
- the construction of the ramp on the railway track could entail restrictions of the movement of people who reside south of the future rail spur, and particularly the users of Salamaya port, the inhabitants of the southern islands.

The possible boat traffic during the construction work - transport of material and equipment, construction of a bridge to support the conveyor over the Dougoufissa - may further congest traffic on this branch of the river. The river is not as busy in the section between the estuary of the Rio Nuñez and the connection with the Koutchoumou river, outside of certain non-motorized fishing boats in the dry season and the occasional passenger transport boat that ferries between the Kamsar ports and the southern districts (delegations of officials or employees of the mining company visiting the southern islands).

At the Rio Nuñez estuary, the dredging work and the construction of a berth for vessels may also cause disruptions in the circulations of boats and canoes. However, these disruptions may be very localized and of short duration.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

In order to optimize this impact, the planned overarching measures to improve road congestion are:

- to develop a Local Development Plan in particular:
  - to provide financial compensation or compensation in kind during the entire period of construction for people who have been financially impacted; and
  - to implement alternative solutions so as not to block the movement of residents of Taïgbé and of the southern islands between the river Dougoufissa and the town of Kamsar, either during the construction of the conveyor or when the latter is in operation (construction of a secured tunnel under the conveyor for the passage of pedestrians and vehicles);
  - to organize a crossing point above the railway track, so as not to hinder the movement of inhabitants living south of the future connection and particularly users of Salamaya port.

Additional mitigation measures regarding the improvement of the transport system:

- to adopt a traffic management plan that avoids traffic during rush hour; and
- to establish a work agenda and a river traffic plan that will be given to the authorities.

The implementation of these mitigation measures will have a minor residual impact during the construction phase. These measures will permit traffic to flow more smoothly and to limit the number of people affected and the frequency of this impact.

Table 16.10 Port area - impacts on mobility, flows and transport during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Road congestion	*Moderate*	- To develop and implement a Local Development Plan in particular: • to provide financial compensation or compensation in kind during the entire period of construction for people who have been financially impacted; and • to implement alternative solutions so as not to block the movement of residents of Taïgbé and of the southern islands between the river Dougoufissa and the town of Kamsar, either during the construction of the conveyor or when the latter is in operation (construction of a secured tunnel under the conveyor for the passage of pedestrians and vehicles); • to organize a crossing point above the railway track, so as not to hinder the movement of inhabitants living south of the future connection and particularly users of Salamaya port. - To develop mitigation measures regarding the improvement of the transport system • Adopt a traffic management plan that avoids traffic during rush hour. • Establish a work agenda and a river traffic plan that will be given to the authorities.	*Minor*

16.2.2.11 Impacts on cultural heritage

Physical deterioration of tangible heritage sites

It is possible that the construction works of the plants will disrupt one or several heritage sites, however a compensation and re-installation plan is already underway.

This impact will have a low magnitude during the construction phase, and its receptor a high sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to implement a procedure for managing incidental findings during the construction phase;
- to implement a compensation system for all the damage caused by the building sites; and
- to ensure these measures are respected by the Project's sub-contracting companies.

The implementation of these mitigation measures will entail a minor residual impact during the construction phase.

Table 16.11 Port area - impacts on cultural heritage during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Physical deterioration of tangible heritage sites	*Moderate*	- Implement a procedure for managing incidental findings during the construction phase; - To implement a compensation system for all the damage caused by the building sites; and - To ensure these measures are respected by the Project's sub-contracting companies.	*Minor*

16.2.2.12 Impacts on living conditions and the landscape

Noise and vibrations

The start-up of the construction of the process facility and other mining infrastructure in the PA could entail a significant increase in noise and vibration disturbances. Truck traffic from the port infrastructure construction may also cause increased levels of noise and vibrations and affect the living conditions of the river dwelling populations, as increased traffic noise and vibrations will affect Kamsar's population.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The following overarching mitigation measures will be implemented to mitigate the impact:

- to implement a RAP for affected populations where inhabited areas are too near to the construction activities of the Project;
- to use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis; and
- as part of the Local Development Plan support the competent authorities in improving the public and private transport services.

Other planned measures to mitigate the significance of this impact are:

- to respect quiet times during the construction period, at night in particular; and
- to consider all technical measures designed to reduce the levels of noise and vibration (plantations, anti-noise walls, etc.).

The implementation of these mitigation measures will entail a minor residual impact during the construction phase. These measures would allow for the sources of noise to be limited and reduce the number of people impacted. The significance of the impact will therefore be reduced.

Dust

Truck traffic for construction work, scouring of land, excavating and backfilling may cause a significant increase in the level of dust during the construction phase, since the first habitation areas are a few dozen meters from the future facilities.

This impact will have a medium magnitude during the construction phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The following overarching measure will be implemented to mitigate the impact:

- to use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis.

Other planned measures to mitigate the significance of this impact:

- to consider all the technical measures designed to reduce the dust emission levels (sprinkling of the tracks, tarring of the roads, etc.).

The implementation of these mitigation measures will entail a minor residual impact during the construction phase. These measures would allow for the sources of dust to be limited and reduce the number of people impacted.

Landscape

The construction of the Project's infrastructure will entail significant changes to the landscape: a jetty to dock the vessels in the estuary, bridge for the conveyor on the Dougoufissa, hard wall buildings and metallic buildings at the port terminal. A lighting system for the Project's facilities mounted on the metal pylons may be installed. The consequences will be notable in terms of changing the natural landscape for the populations who live in the bordering area of the future terminal.

This impact will have a large magnitude in the construction phase, but a low sensitivity, in view of the existing industrial activity common to Kamsar. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to limit the height of the Project's future plants;
- to plan the rapid decommissioning of the temporary infrastructure required for the construction of the permanent infrastructure (cranes, etc.); and
- to provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed downward).

The implementation of these mitigation measures will entail a minor residual impact during the construction phase. In essence, these measures mitigate the sources of impact regarding the degradation of the landscape.

Table 16.12 Port area - impacts on living conditions and landscape during construction

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Noise and vibrations	*Moderate*	- The following overarching measures will be implemented to mitigate the impact: • to implement a RAP for affected populations where inhabited areas are too near to the construction activities of the Project; • to use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis; • as part of the Local Development Plan support the competent authorities in improving the public and private transport services. - To respect quiet times during the construction phase, at night in particular; - To consider all technical measures designed to reduce the levels of noise and vibration (plantations, anti-noise walls, etc.);	*Minor*
Dust	*Moderate*	- To use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis. - To consider all the technical measures designed to reduce the dust emission levels (sprinkling of the tracks, tarring of the roads, etc.). - To limit the height of the Project's future plants.	*Minor*
Landscape	*Moderate*	- To plan the rapid decommissioning of the temporary infrastructure required for the construction of the permanent infrastructure (cranes, etc.). - To provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed downward).	*Minor*

16.2.3 Operating phase

16.2.3.1 Sources of impact

The operating phase corresponds to the start of bauxite train traffic between the mine and the port. It is estimated that 4 trains carrying 120 wagons will pass through the MA and the PA each day, and they will thus cross the urban center of Kamsar each day.

Many work trucks and light vehicles will be brought to circulate around the port plants and in the city of Kamsar (specifically, transport of Project employees).

Hazardous materials might be stored and used (this would mainly consist in fuel and small quantities of maintenance chemicals) at the port terminal.

Ore vessels will regularly navigate in the Rio Nuñez estuary to the jetty of the new port terminal.

The operating phase will allow for the following creation of jobs:

- creation of direct jobs by the Project to meet its labor requirements (during the operational phase GAC plans to employ on the PA up to 360 full-time workers, 60 of whom are executives);
- creation of indirect jobs by the Project's subcontractors; and
- creation of jobs related to the needs in supplying goods and services.

Finally the operation phase will correspond to a period of increased public revenue from national and local administrations, linked to the payment of taxes paid by the Project during the operational phase. The start of operations will see the creation contribution of a Local Development Fund (LDF) by the Project.

16.2.3.2 Impacts on demographics and social dynamics

Increase in social tensions

At the beginning of the operation phase, many migrants seeking work may move to Kamsar. Moreover, the employees recruited for long-term work by the Project or its sub-contractors and not from the area will probably bring their families to settle there. Even if it is a constant, this flow of migrants will quantitatively decrease over time as Project activities stabilize.

The economic pressure on workers and the level of social tension around employment will remain elevated. In effect, the number of hires by the Project will always concern a minority of people with regard to the number of individuals in search of salaried jobs and situated in the area. A potential lack of transparency in the recruitment process could cause tensions surrounding the Project, those not recruited feeling aggrieved.

Certain social dynamics and behaviors, typical in mining and port areas, may develop in all levels of social fabric; divorces by workers, teenage pregnancies, loss of traditional social references, increase in petty larceny, acts of vandalism, risky behavior, etc. caused by intracommunity tensions.

The magnitude of this impact is considered medium, its receptors sensitivity high, and its significance major.

The following overarching measures will be implemented to mitigate the impact:

- to ensure local preferential hiring is implemented so as to benefit to the Project resettled people and local communities in priority; and
- to implement and fund development projects as part of the Local Development Plan in order to reinforce or create income generating activities especially those performed by women -horticulture, trade, etc. and enhance public infrastructure and services benefiting to all.

The residual impact will be moderate. The significance of the impact may essentially diminish if the tension risks are managed upstream. The involvement of communities as stakeholders may also diminish the sensitivity of the impact.

Table 16.13 Port area - impacts on demographics and social dynamics during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in social tensions	*Major*	- The following overarching measures mentioned in *Section 14.5*, will be implemented to mitigate the impact: • ensure local preferential hiring is implemented so as to benefit to the Project resettled people and local communities in priority; and • implement and fund development projects as part of the Local Development Plan in order to reinforce or create income generating activities especially those performed by women -horticulture, trade, etc. and enhance public infrastructure and services benefiting to all.	*Moderate*

16.2.3.3 Impacts on power, governance and civil society

Strengthening of civil society around intellectuals and workers

There should be continuity in the strengthening of civil society in the settlements of the MA, a dynamic that was initiated during the construction phase.

The magnitude of this impact is considered low and its receptors sensitivity high. Its significance is therefore moderate.

The planned improvement measures to develop this impact are the same as those in the construction phase (see *Section 16.2.3.3).*

The residual positive impact will be major. In effect, the application of these measures may allow a large number of people to integrate into civil society.

Risks of tension between the population and local administrative authorities

The risks of tensions between the population and the local administrative authorities will be identical, during the operation phase, as those identified in the construction phase, but may be increased (*see Section 16.2.2.3,* Risks of tension between communities and local administrative authorities). Authorities could be taxed for poor management of increasing funds dedicated to development, and they may have to manage more conflicts between GAC and Kamsar residents.

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a major significance.

The mitigation measures to avoid tensions between communities and authorities are similar to those recommended in the construction phase.

The residual impact is considered moderate.

Increase in the risk of poor financial management

The financial volumes managed by the local authorities will increase through regulatory contributions of the Project during the operation phase (and specifically the membership of LDF). It is possible that corruption and embezzlement practices develop.

This impact will have a medium magnitude and receptors have high sensitivity. It is therefore considered as being of major significance.

The mitigation measures are identical to those anticipated during the construction phase.

The residual impact is considered moderate. These mitigation measures will limit corruption so more people will benefit from the funds allocated by the

Project. The regular information to all stakeholders could also mitigate their sensitivity to this problem.

Table 16.14 Port area - impacts on powers, governance and civil society during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Strengthening of civil society	*Moderate*	- Implement and fund development projects as part of the Local Development Plan with the objective to improve access and quality of education in the area; and - Engage regularly with the associations and organizations of citizens as part of the Project Stakeholder Engagement Plan	*Major*
Risks of tension between communities and local administrative authorities	*Major*	- The establishment of an effective and transparent grievance mechanism and to report on this mechanism to the authorities in Kamsar and in the villages impacted by the Project's activities. - To support the local authorities in their communication steps related to expenses for the local development; - Involving the administrative authorities in regular information and collaboration meetings in order to keep them informed of the progress of the Project's activities; - Developing a local development agreement (LDA) and community development plan on a collaborative basis with the competent authorities and widely circulate information on this tool; - To gather information on the possible factors of tensions and conflicts in the port area, identifying and implementing development projects (particularly the basic infrastructure) supported by GAC using their own funds; - Ensuring the transparency of the Project's participation in financing development activities, when using own funds or via the contribution to the public budgets; - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes; and - To support the local authorities in their communication steps related to expenses for the local development; - To ensure the transparency of the Project's contributions to the budget of the local communities.	*Moderate*
Increase in risks of corruption	*Major*	- To support the local authorities in their communication steps related to expenses for the local development. - To continue with the implementation of the recruitment policy. - To favor methods of communication that can reach the majority of the stakeholders (radio broadcasting for example). - To comply with the legal obligation of putting in place a corruption monitoring plan.	*Moderate*

16.2.3.4 Impacts on the land

Increase in land prices

During the entire operations phase of the Project, the flow of job seekers will be largely to the city of Kamsar. This constant population growth may have consequences on the price of rents and lands.

As the Project will not increase its land area during the operational phase, the impacts related to land use will remain relatively limited in the PA during the operations phase.

This impact will be low during the operations phase but would have medium sensitivity, the significance of the impact will be minor.

The main measure proposed to mitigate this impact consists of collaborating with the local authorities to develop areas for migrants to settle in (land division into plots).

The implementation of these mitigation measures will have a low residual impact insofar as they allow for limiting the risk of inflation without making it disappear.

Table 16.15 Port area - impacts on land use during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in land prices	*Minor*	- To support Local Authorities in developing and implementing an Influx management plan in particular by keeping collaborating with the local authorities to develop area for migrants to settle in (division into designated plots).	*Minor*

16.2.3.5 *Impact on agriculture*

Reduction of agricultural yields

During the operation phase, the impacts on agriculture in the port area will be very limited. It is possible that the dust released by the handling of bauxite (unloading of trains, loading the conveyor) will reduce the yield of the surrounding agricultural communities (rice paddies on Taïgbé Island cultivated plots between the CBG and the GAC facilities) and that this may reduce revenues for the concerned households. However, dust can already be found in surroundings due to the industrial facilities in the area (cf. *Chapter 7, Environmental baseline*). The risk of accidents and discharge of wastewater effluents or fuel spill in the surface water near the port terminal may also have an influence on the quality of the water used to fertilize the rice paddies on Taïgbé Island.

This impact will have a low magnitude and medium sensitivity. The significance of the impact will therefore be minor.

The planned measures to mitigate the significance of this impact are:

- to adopt anti-dust measures (truck traffic, bauxite handling) in the port terminal; and
- to undertake measures to prevent accidents and the risk of discharging effluents into the environment and minimize as much as possible the cause of these dangers.

The implementation of these mitigation measures will entail a negligible residual impact during the operational phase. They would limit the significance of the impact by reducing the risk of lowered agricultural yields.

Table 16.16 Port area - impacts on agriculture during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduction of agricultural yields	*Minor*	- Adopt anti-dust measures (truck traffic, bauxite handling) in the port terminal. - To undertake measures to prevent accidents and the risk of discharging effluents in the environment and minimize as much as possible the cause of these dangers.	*Negligible*

16.2.3.6 Impacts on fishing and access to natural resources

Degradation of the quality of surface water and pressure on the resource

Access to water in the city of Kamsar may continue to decline with the continued flow of migrants searching for work (pressure on existing facilities). Similarly, the risk of accidental discharge of wastewater effluents or fuel spill in the surface waters close to the port terminal remains elevated during operations, and constitutes a potential deterioration factor in the quality of the surface waters drawn by the villagers in the southern localities of the SP.

This impact will have a low magnitude during the operational phase, but high sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are identical to those recommended in the construction phase (see *Section 16.2.2.6, Degradation of the quality of surface water and pressure on the resource*).

The implementation of these mitigation measures will entail a minor residual impact during the operational phase. The mitigation measures will in fact allow for reducing the significance of the impact by preserving the access to good quality water for a large number of people.

Reduction in fishing

The traffic of ore vessels across from the SP's southern islands and the city of Kamsar as well as the one-time operation of dredging the channel in the operation phase may have significant consequences on fishing activities in the Rio Nuñez estuary. This vessel traffic will have an impact both on the mobility of fishermen (congestion in the traffic area by crafts) and on the maritime ecosystems (physical disruptions in the area with probable consequences on the availability of fish stocks).

In addition, the risk of accidental discharge of effluents in the marine environment in proximity of the port terminal during the operation phase may also have an impact on the ecosystem (chemical disruptions) and diminish the biomass stocks and /or have an impact on the biodiversity of the area.

This impact will have a medium magnitude during the operational phase and a high sensitivity. The significance of the impact will therefore be major.

The planned measures to mitigate the significance of this impact are identical to those recommended in the construction phase (see *Section 16.2.2.6, Reduction in fishing*).

The implementation of these mitigation measures will have a residual moderate impact during the operational phase limiting both the risk of accidents for the fishermen and the decrease in fish stocks.

Table 16.17 Port area - impacts on fishing during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Degradation of the quality of surface water and pressure on the resource	*Minor*	- To construct improved water sources (type, location, number of works, functioning conditions, and undertake to choose them in conjunction with local populations) in proximity of habitation areas and those not served by the existing water distribution system, as well as in the welcome sections of the migrant populations (peripheral areas); - To monitor and update the measures to prevent accidents and the risk of discharging effluents in the natural setting and minimize as much as possible the cause of these dangers.	*Minor*
Reduction in fishing	*Major*	- Adopt measures within the framework of the Stakeholder Engagement plan (SEP) as an overarching measures is expected to mitigate this impact, in particular by: • informing the fishermen of the area upstream of operations in order to limit the impact of the Project on the mobility of fishermen in the estuary; • establishing with Port Authorities a boat traffic plan for construction and dredging work in the estuary, and to share with the affected populations; - To undertake measures to prevent accidents and the risk of discharging effluents in the natural setting and minimize as much as possible the cause of these dangers - Apply the mitigation measures proposed in the environmental impact study (the biological part regarding fish stocks).	*Moderate*

16.2.3.7 Impacts on the local socioeconomic context

Improvement in the economic situation of recruited persons and of their households

During the operational phase, the Project will directly employ around 360 people, 60 of whom are supervisors. This number of permanent direct jobs is unlikely to be entirely filled by inhabitants of Kamsar. In addition, the jobs offered by sub-contractors may be associated with less advantageous conditions for their employees (salary level, social protection, etc.).

Consequently, the impact will have a low magnitude in the operations phase, but very high sensitivity. Its significance would therefore be moderate.

To reinforce this positive impact, the Project will endeavor to follow the same measures as those in the construction phase (*see Section 16.2.2.7, Improvement in the economic situation of recruited persons and of their households).*

The residual impact is considered major insofar as these measures will guarantee a situation that is financially and humanly acceptable to the persons recruited by the Project.

Increase in demand, economic diversification and reinforcement of local entrepreneurship

The tendency for demand to increase, economic diversification and the reinforcement of local entrepreneurship will continue in the operational phase as it the construction phase (*see Section 16.2.2.7, Increase in demand, economic diversification and reinforcement of local entrepreneurship*). Indeed, migrants will keep coming, and the purchasing power of households having found work on the Project will keep increasing. The Project's needs in equipment and services will continue to increase too.

The magnitude of this impact is considered medium and its receptors sensitivity medium in the operational phase. Its significance is therefore moderate.

The measures to reinforce this positive impact are the same as those in the construction phase.

The residual impact will be moderate insofar as the local businesses will further benefit from increased work opportunities, though without it being a large-scale phenomenon.

Capacity-building and professional expertise in a globalized context

The capacity-building and professional expertise phenomenon in a globalized context might be similar to the one identified in the construction phase (see *Section 16.2.2.7)*. Workers on the Project will keep improving their skills and professional experience and will be more and more familiar with the working methods and requirements of a multinational company.

The magnitude of this impact is considered low insofar as few people will be concerned.

Its sensitivity is considered high. Its significance is therefore moderate.

The measures to reinforce this impact are the same as those in the construction phase.

The residual impact could be major. These improvement measures may in fact assure capacity-building for all of the local workers, but also for some people who could not be recruited.

Increase in local development initiatives

Throughout the entire operational phase, it is assumed that the port area will profit from funds dedication to community development: regulatory contributions to the budget of local authorities (the LDF subscriptions) and possibly its own funds from the company. The implementation Project may limit certain direct and local impacts of the Project and lead to a stimulation of the local economy. Finally, the economic development of the area will lead to an increase in tax revenue that could allow the State to increase these public expenses.

The magnitude of this impact is large during the operation phase and its receptors sensitivity is medium. Its significance is therefore considered major.

The planned improvement measures to develop this impact are the same as those in the construction phase (see *Section 16.2.2.7, Increase in local development initiatives*).

The residual impact will retain a major level of significance insofar as these measures, put into place since the construction phase, will have the time to generate the first positive results.

Table 16.18 Port area - impacts on local socioeconomic context during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement in the economic situation of recruited persons and of their households	*Moderate*	- The overarching measures of local preferential hiring will be implemented to mitigate the impact: • To pursue a local recruitment policy. • To favor the sustainability of the job. • To assure decent salary conditions for the employees; and • To ensure, both under agreements signed with subcontracting companies and in practices in the field, that the commitments GAC has made in favor of employees and the communities impacted are respected by all Project's stakeholders (random checks might be put in place to check the working conditions in the subcontracting companies of the Project).	*Major*
Increase in demand, economic diversification and reinforcement of local entrepreneurship	*Moderate*	- To ensure local preferential hiring and sourcing is implemented to benefit to local entrepreneurs and businesses at local, regional and national level, including through a capacity building program aiming at building local business competencies to meet the Project standards including quality, health and safety requirements	*Moderate*
Capacity-building and professional expertise in a globalised context	*Moderate*	- In order to reinforce this impact the Project will ensure employees are continuously trained: • to support continuous training for the employees of the Project and their subcontractors; and • to anticipate the short-term retraining for employees (professional training, training on job-seeking).	*Major*
Increase in local development initiatives	*Major*	- To increase the amount of the community investments using own funds. - To involve the communities and local authorities during the construction of basic infrastructure or the implementation of development projects, in order to find out their specific needs (recording of investments within the framework of the Local Development Plan of the communes). - To respect the framework of collaboration with regular meetings (sub-prefectoral, communal and district authorities, GAC and representatives of the subcontracting companies). - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes. - To ensure the transparency of the Project's contributions to the budget of the local institutions. - To support the local authorities in their communication steps related to expenses for the local development.	*Major*

16.2.3.8 Impacts on health and safety

Diseases related to water and sanitation

The risk of increase in the number of illness related to water and sanitation identified in the operation phase will be identical as those identified in the construction phase since the population influx will continue and maintain the pressure on the water resources and hygiene facilities, as well as on the waste management system (*see Section 16.2.2.8, Diseases related to water and sanitation).*

The magnitude of this impact is considered medium and its receptors sensitivity medium in the operation phase. The impact therefore has a moderate significance.

Some mitigation measures are common to all the impacts identified on the health and safety and the workers and the communities, and are identical to those proposed in the construction phase. They will not be repeated in the mitigation measures identified for other impacts related to health.

The specific mitigation measures for risks to health related to water and sanitation are also identical to those proposed in the construction phase.

The implementation of these mitigation measures will entail a low residual impact during the operational phase.

Air quality

Bauxite handling (unloading trains, loading and transporting ore on the conveyor) during the operation phase will generate dust in the port terminal and could increase the risk of contracting respiratory diseases for employees and nearby communities.

This is assessed in detail in *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.

Noise

The level of noise and vibrations associated with activities in the operations phase should be relatively high (train, boat and vehicle traffic from the Project, the conveyor, etc.) and will constitute a stress factor for the employees of the Project and for the river-dwelling populations.

This is assessed in detail in *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.

Diseases related to the displacement of populations

The risk of developing diseases associated with movements of the population will be identical to what was identified in the construction phase since workers might keep their risky behaviors and population will keep growing (see *Section 16.2.2.8, Diseases related to the displacement of populations*).

The magnitude of this impact is medium and its receptors sensitivity high. The impact therefore has a major significance.

The measures to mitigate this impact are identical to those proposed in the construction phase.

The residual impact will be moderate. These mitigation measures would in fact allow for preventing the problems related to the health and safety conditions, and therefore limit the source of impact.

Risks to the safety of populations

The risks to the safety of populations will be the same as those identified in the construction phase, in parallel with population growth (*see Section 16.2.2.8, Risks to the safety of populations).*

The magnitude of this impact is medium during the operational phase and its receptors sensitivity is high. Its significance is therefore major.

The measures to mitigate this impact are identical to those proposed in the construction phase.

The residual impact will be considered moderate. These mitigation measures might in fact mitigate, as a preventative, the risks in terms of health and safety of the populations.

Risks for the security of workers

The risks to the safety of populations, during the operations phase, will be the same as those identified in the construction phase (*see Section 16.2.2.8, Risks for the security of workers).*

This impact will have a medium magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are the same as those planned in the construction phase.

The implementation of these mitigation measures will entail a low residual impact during the operational phase.

Improving services and access to healthcare services

The tendency to improve services and access to healthcare services will be identical, in the operations phase, to those identified in the construction phase since budgets dedicated to local development will increase (*see Section 16.2.2.8, Improvement of health care services and Access to healthcare).*

The magnitude of this impact is considered medium and its receptors sensitivity high. The significance of the impact is therefore major.

To reinforce this impact, the same measures will be put in place as those identified in the construction phase.

The residual positive impact is considered major insofar as a higher number of people will be able to benefit from healthcare services and the needs will have been identified in advance.

Road and maritime security

Project vehicle traffic in Kamsar will continue in the operations phase (transport of employees, maintenance operations, etc.) and will represent an increased risk in terms of road security.

The regular traffic from bauxite trains from the outskirts of Kamsar to the port terminals will also increase the risk of accidents for residents of the city who are near the railway.

The comings and goings of ore vessels and the crafts for dredging the channel will be a danger for the fishing canoes in the Rio Nuñez estuary.

The increase in road, rail and maritime insecurity will have a medium impact in the operations phase, and a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are:

- to adopt a traffic management plan that avoids traffic during rush hour and road traffic code (speed limits, signs, signals at the entrance of sites, etc.);
- to prohibit the access of non-authorized persons to the work sites;
- to pay for the costs induced by road traffic accidents for which the Project's vehicles are proven liable;
- to create with Port Authority and apply a maritime traffic code that takes into account the fishermen in the area;
- to put a campaign in place to raise the awareness of the population on road and maritime safety issues; and
- to inform the authorities (specifically the port authorities) of the nature and agenda of the business work in the area of the estuary.

The implementation of these mitigation measures will have a low residual impact during the operational phase.

Table 16.19 Port area - impacts on health and security during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Mitigation measures common to all the impacts on health		- To evaluate the risks and the impacts on health and safety to which the affected communities are exposed and to take the appropriate prevention measures. - To use work techniques and methods adapted to protect the environment, the safety of workers and the population living near the rivers. - To develop a "Health, Safety and Hygiene Plan" in accordance with the Mining Code 2013. - To design and construct the structural elements of the Project by taking account of the risks to which the workers and the affected communities are exposed. - To reduce the potential exposure of the community to hazardous materials and substances. - To consider physical resettlement when the technical measures available may not lower the level of pollution to an acceptable level. - To inform the populations about construction sites and their duration and to report the risks associated with the activities of the Project. - To financially support the construction of the healthcare infrastructure in the impacted settlements, in partnership with the government and the competent authorities. - To support campaigns raising the awareness of the Project's workers and communities on health problems, in collaboration with national and/or international NGOs. - To use a grievance mechanism and ensure that this latter is known (information campaign), is transparent and is functional.	
Diseases related to water and sanitation	*Moderate*	- to support Local Authorities in developing and implementing an Influx management plan in particular by: • supporting the local authorities in managing migration flows and the associated urban planning; and • putting in place of an effective waste management system, installation of hygiene infrastructure (particularly latrines) in public places, installation of improved water bodies (via investments using own funds or support to the competent authorities). - To develop a Local Development Plan in particular by supporting the authorities and civil society to implement awareness-raising campaigns on hygiene. - To reduce the production of hazardous and non-hazardous waste and eliminate it appropriately (residue, waste and hazardous materials' management strategy). - To avoid or reduce and control the discharge of effluents in the environment (evaluate their production, transport, handling, stockpile and use). - To adopt anti-dust measures (truck traffic, scouring of land, sweeping and backfilling operations).	*Minor*
Air quality		Refer to *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.	
Noise		Refer to *Chapter 9, Environmental Impact Assessment for Port activities* of this SEIA Addendum.	

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Diseases related to the displacement of populations	*Major*	- To support Local Authorities in developing and implementing an Influx management plan in particular by: • supporting the local authorities in the management of migration flows and urban planning (housing in particular); • initiating measures that would avoid population pressure- the Project will operate, for example, bus services to access the work sites in order to thin out the lodging areas for temporary workers; • supporting for upgrading health, education, water and sanitation facilities in settlements affected by in-migration. - To develop a Local Development Plan in particular by: • promoting, as part of the initial training, the raising of the awareness of the Project's personnel on transmitted diseases (for example, tuberculosis) and sexually transmitted diseases (for example, HIV/AIDS), vector-borne diseases (for example, malaria) and other diseases as appropriate; and • organizing awareness-raising campaigns on public health problems with the communities in collaboration with national and international NGOs. - To communicate and enforce the Code of business conduct in particular by: • Enforcing provisions related to workers communities, drug and alcohol consumption and interactions with local communities and the prohibition of illegal activities, including the use of sex workers and the consumption and/or the traffic of illegal substances. - To explicitly prohibit any illegal activity carried out by all of the Project's personnel, including the use of sex workers, the sex trade and the consumption and/or the traffic of illegal substances. - To establish a systematic medical inspection and a screening of workers at least once a year and to develop a healthcare adjustment plan (Article 143 of the Mining Code 2013). - To design and administer the accommodation camps in accordance with international best practices on the accommodation of workers, particularly the criteria of the IFC. - To support the development of the healthcare infrastructure of the region through investment using own funds, by providing specific structures for viral diseases.	*Moderate*
Risks to the safety of populations	*Moderate*	- To carry out awareness-raising actions with GAC workers and its subcontractors on risky practices and the GAC policy on relations between workers and with the communities. - To support the public authorities for the implementation of awareness-raising campaigns on risky behavior, in collaboration with the national and international NGOs.	*Moderate*
Risks for the security of workers	*Moderate*	- To establish a worker protection system against occupational diseases (screening of factors of harm, regular medical visits of the workers, etc.). - To identify the potential dangers for the workers, particularly likely to constitute a threat for their lives. - To initiate measures designed to prevent accidents, injuries and diseases resulting from the work by minimizing, as much as possible, the cause of such dangers.	*Minor*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
		- To safeguard the safety of the machines and equipment. - To assure the ability to work of the workers (physical conditions). - To develop a training program for the Project's workers (direct and indirect jobs) in order to ensure that these employees have the skills, information and capacities required to manage the risks associated with the job to which they are assigned. - To provide the workers with all the protection equipment necessary for the prevention of the risks associated with the tasks carried out as part of the job. - To check compliance with the application of the aforementioned standards by the subcontractors of the Project, particularly by conducting regular audits and taking corrective measures if need be.	
Improvement of health care services	*Major*	- To maximize the amount of investments using own funds in the healthcare sector. - Involve the communities and local authorities during the construction of basic infrastructure or the implementation of development projects, in order to find out their specific needs (recording of investments within the framework of the Local Development Plan of the communes). - To implement the Local Development Plan (LDP) based on the local development agreement (LDA) on a collaborative basis with the competent authorities and widely circulate information on this tool.	*Major*
Access to healthcare	*Moderate*	To support Local Authorities in developing and implementing an Influx management plan in particular by anticipating the reinforcement of healthcare infrastructure in relation to the arrival of migrants. - To develop a Local Development Plan in particular by: • participating, in collaboration with the local administrative authorities (within the framework of a Local Development Plan), in the renovation of public health infrastructure in the southern islands (materials, equipment and infrastructure); and • providing for financial compensation or compensation in kind for the displaced households through the transition period to enable them to maintain the same financial capacity of access to healthcare.	*Minor*
Road and maritime security	*Moderate*	- To put in place alternative solutions so as to not block the flow of locals from Taïgbé and the southern islands between the Dougoufissa river and the city of Kamsar. - To organize a crossing point above the railway track, so as not to hinder the movement of inhabitants living south of the future connection and particularly users of Salamaya port. - To adopt a traffic management plan that avoids traffic during rush hour and road traffic code (speed limits, signs, signals at the entrance of sites, etc.). - To prohibit the access of non-authorized persons to the building sites. - To pay for the costs from road traffic accidents for which the Project's vehicles are proven liable. - To create with Port Authority and apply a maritime traffic code that takes into account the fishermen in the area. - Put a campaign in place to raise the awareness of the population on road and maritime safety issues. - Inform the authorities (specifically the port authorities) of the nature and agenda of the business work in	*Minor*

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
		the area of the estuary.	

16.2.3.9 Impact on education

Improving services and access to education services

During the Project's operations phase, the positive impacts of the renovation and new infrastructure construction projects regarding education will be more obvious because they will be the results of several years, even decades, of investment of GAC's own funds and funds from the Project to development budgets of local collectivities. These projects will have a positive effect on education in the port area.

The Project's direct employees will additionally have a tendency to value higher education for their children and will have the means to pay for it.

These elements will counterbalance the growing pressure on education infrastructure related to the continued increase in Kamsar's population.

The magnitude of this impact is medium and its receptors sensitivity medium. Its significance is therefore moderate.

Therefore the Project will develop and implement of a Local Development Plan which one of the objectives is to improve access and quality of education, by:

- to maximize the investments using own funds in this domain;
- to support the authorities to direct part of the LDF to the support of the education sector;
- to favor the construction of new infrastructure in less advantaged sections of the city;
- to support creation of professional training centers and universities in the city of Kamsar; and
- to put in place a study bursary program that would encourage parents to educate their children, particularly girls.

The residual positive impact will be major. These reinforcement measures would mean that a maximum number of persons will be able to benefit from improved access to education.

Table 16.20 Port area - impacts on education during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improving services and access to education services	*Moderate*	- The Project will develop and implement of a Local Development Plan which one of the objectives is to improve access and quality of education, by: • to maximize the investments using own funds in this domain; • to support the authorities to direct part of the LDF to the support of the education sector; • to favor the construction of new infrastructure in less advantaged sections of the city; • to support creation of professional training centers and universities in the city of Kamsar; and • to put in place a study bursary program that would encourage parents to educate their children, particularly girls.	*Major*

16.2.3.10 Impacts on mobility, flows and transport

Congestion of traffic areas (roads and maritime routes)

The ore vessel traffic should be limited during operations in the channel and the loading jetty. Due to their number and traffic, they will have an impact on the mobility of fishermen and transport vessels in the estuary. The magnitude of this impact is conservatively evaluated as large, as data concerning the number of ships and the amount of traffic is not available at the time of the report.

Project vehicle traffic in Kamsar will continue in the operations phase (transport of employees, maintenance operations, etc.) and will represent an increased risk in terms of road security. Bauxite train traffic from the outskirts of Kamsar to the port terminal will also lead to periods of slow traffic in the city. This impact will be all the more elevated since the population density situated along the rail edge in the city of Kamsar is high.

This impact will have a large magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be major.

The planned measures to mitigate the significance of this impact are identical to those planned in the construction phase (see *Section 16.2.4.10,0.0.0.0 Road congestion*).

The implementation of these mitigation measures will entail a moderate residual impact during the operational phase. These measures allow for more fluid traffic flow and to limit the number of people impacted and the frequency of this impact. The significance of the impact will therefore be reduced.

Table 16.21 Port area - impacts on mobility, flows and transport during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Congestion of traffic areas (roads and maritime routes)	*Major*	- To develop and implement a Local Development Plan in particular: • to provide financial compensation or compensation in kind during the entire period of construction for people who have been financially impacted; • to continue deploying shuttles to help and redirect fishing boats (the majority of which are non-motorized canoes) who will want to head toward the channel or non-authorized routes; and • to maintain several secured passages for pedestrians and vehicles over the rail road so as to not restrict either the movement of these inhabitants or the railway. - To control and update the traffic management plan that avoids traffic during rush hour. - To maintain, update and respect the work agenda and the river traffic plan that will be given to the authorities.	*Moderate*

16.2.3.11 Impacts on cultural heritage

As no further land will be required in the operations phase in the port area, the impact on cultural heritage during this phase is negligible.

16.2.3.12 Impacts on living conditions and the landscape

Noise and vibrations

During the operations phase, the impacts in terms of noise and vibrations will remain the same as during the construction phase (related to the Project's train and vehicle traffic, the handing of bauxite in the terminal, the conveyor, etc.).

This impact will have a medium magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be moderate.

The planned measures to mitigate the significance of this impact are similar to those recommended in the construction phase (see *Section 16.2.2.12, Noise and vibrations*).

The implementation of these mitigation measures will entail a minor residual impact during the operational phase.

Dust

Handling bauxite in the terminal and its movement on the conveyor may generate dust.

This impact will have a low magnitude during the operational phase, and its receptor a medium sensitivity. The significance of the impact will therefore be minor.

The main mitigation measure set out in the operation phase consists of adopting anti-dust measures in the port plant facilities (covering the bauxite handling and conveyor areas).

The implementation of these mitigation measures will entail a negligible residual impact during the operational phase. These measures would allow for the sources of dust to be limited and reduce the number of people impacted. The significance of the impact will therefore be reduced.

Landscape

Alteration of the landscape brought about by the Project's facilities will not change following their construction. This impact is thus considered negligible during the operation phase.

Table 16.22 Port area - impacts on living conditions and landscape during operations

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Noise and vibrations	*Moderate*	- The following overarching mitigation measures will be implemented to mitigate the impact: • to implement a RAP for affected populations where inhabited areas are too near to the construction activities of the Project; • to use a transparent and effective grievance mechanism that will be able to resolve situations on a case-by-case basis; - As part of the Local Development Plan support the competent authorities in improving the public and private transport services. • to respect quiet times during the building sites, at night in particular; • to consider all technical measures designed to reduce the levels of noise and vibration (plantations, anti-noise walls, etc.); and • to support the competent authorities in improving the offer of public and private transport.	*Minor*
Dust	*Minor*	- To keep applying anti-dust measures in the plant port areas (coverings in areas where bauxite is handled and the conveyor is used).	*Negligible*

16.2.4 Closure phase

16.2.4.1 Sources of impact

The direct sources of impact on the PA during the closure phase in terms of the Project's direct contributions to local economic development are the following:

- termination of jobs by the Project and its subcontractors;
- closure of the local development initiatives initiated using own funds; and
- end of the contributions to the institutional budgets dedicated to local development.

16.2.4.2 Impacts on demographics and social dynamics

Social tensions

The closing of the Project activities may coincide with an end to migration to Kamsar and the departure of the Project worker's families who are not originally from the area. The demobilization of the workers of the Project and of its subcontractors might lead to a tense atmosphere caused by the likely increase in the unemployment rate. This phenomenon may cause a strong disruption of the social fabric, causing family tensions. Furthermore, the local economy may enter into a recession (lowering of general demand due to reduced purchasing power of the Projects workers). With the possible increase in the poverty level, there may be an increase in petty delinquency (acts of vandalism, robberies, etc.), causing an increase in social tensions in the urban center. It is also possible that the former workers and the local authorities attempt to appropriate the equipment and the materials that the Project will demobilize. This phenomenon could create a climate of competition that would cause tensions.

The impact will have a medium magnitude and receptors have high sensitivity. Its significance is considered major.

To mitigate this impact, the Project will implement the following measures:

- to reinforce the Project Local Development Plan objective and programs in particular by:
  - promoting employment and training including through the provision of professional training courses and training on job-seeking;
  - taking measures throughout the Project that favor local long-term notice on the mine closure plan so that the communities and the authorities can prepare themselves for it; and development (infrastructure, skill transfer, etc.); and
- to ensure that all the workers (and those employed by sub-contractors) will be demobilized according the norms put in effect by the Guinean work code legislation; and
- to assure the monitoring of the demobilization and of the decommissioning of the equipment and materials.

The residual impact will be considered moderate insofar as the mitigation measures will allow the risks caused by the closure to be anticipated beforehand.

Table 16.23 Port area - impacts on demographics and social dynamics during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Social tensions	*Major*	- To reinforce the Project Local Development Plan objective and programs in particular by: • promoting employment and training including through the provision of professional training courses and training on job-seeking; and • taking measures throughout the Project that favor local long-term d report on the mine closure plan with sufficient notice so that the communities and the authorities can prepare themselves for it; and development (infrastructure, skill transfer, etc.); and - To ensure that all the workers (and those employed by sub-contractors) will be demobilized according the norms put in effect by the Guinean work code legislation. - To ensure the monitoring of the demobilization and of the decommissioning of the equipment and materials.	*Moderate*

16.2.4.3 Impacts on power, governance and civil society

Risks of tension between communities and local administrative authorities

During the closure phase, the impacts of the Project on local power may have the following effects:

- pressure on the authorities concerning the future of the workers being demobilized and the unrest of the population in general regarding their future;
- potential tensions and conflicts with local authorities within a general context of local economic recession (predation of the assets of the Project involving the authorities, etc.); and
- potential tensions and conflicts regarding the rights of lands freed up by the decommissioning of the Project's infrastructure (port terminal).

The impact will have a medium magnitude and medium sensitivity. Its significance is considered moderate.

The mitigation measures to avoid tensions between communities and authorities are the following:

- to collaborate regularly with the sub-prefectoral and communal authorities in order to keep them informed and prepare them for the closure of the Project and collect information on the possible factors of tensions and conflicts in the port area;
- to clarify the legal status of lands that may be freed and the regulator's rights and usages associated with them;
- to participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes; and
- to support the local authorities in their communication steps related to closure of the Project.

The residual impact will be considered minor.

Weakening of civil society

Many NGOs and various organizations may take the opportunity to collaborate with the Project in the closure phase. The civil society organizations that benefited from the presence of GAC during the Project may risk losing their influence.

However, the total reinforcement of the civil society during the entire operation phase through education, training, and the spread information may be maintained throughout the closure.

The magnitude of this impact is therefore considered low and its receptors sensitivity medium. Its significance is therefore minor.

The mitigation measures to assure the maintenance of a strong civil society are:

- to regularly inform the organizations and associations of civil society on the closure of the Project; and
- to support the education and training of the populations of the PA throughout the Project.

The residual impact is considered minor.

Table 16.24 Port area - impacts on powers, governance and civil society during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Risks of tension between communities and local administrative authorities	*Moderate*	- To collaborate regularly with the sub-prefectoral and communal authorities in order to keep them informed and prepare them for the closure of the Project and collect information on the possible factors of tensions and conflicts in the port area; - To clarify the legal status of lands that may be freed and the regulator's rights and usages associated with them; - To participate in the meetings organized by the Prefecture Development Committee (PDC) on mining stakes. - To support the local authorities in their communication steps related to closure of the Project.	*Minor*
Weakening of civil society	*Minor*	- To regularly inform the organizations and associations of civil society on the closure of the Project. - To keep supporting the education and training as part of the Project Stakeholder Engagement Plan of the populations of the PA throughout the Project.	*Minor*

16.2.4.4 Impacts on the land

Reduced pressure on land resources

During the closure phase, some people may leave Kamsar city (the departure of job seekers and demobilized workers not originally from the area). This situation may have a positive impact on lowering the pressure on land use and the cost of land and the lodging in the urban center that may become financially accessible to a larger part of the population.

The continued lessening of pressure on land resources is considered low (Kamsar will still remain attractive due to the availability and quantity of its infrastructure) and a medium sensitivity. The significance is therefore minor.

The measure planned to reinforce this positive impact consists of supporting the authorities in their territorial planning and population information stages in order to assure optimum management of the land available.

The residual impact will stay minor insofar as the pressure on land resources may continue despite the implementation measures.

Table 16.25 Port area - impacts on land use during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduced pressure on land resources	*Minor*	- To support the authorities in land management planning.	*Minor*

16.2.4.5 Impact on agriculture

Increase in areas dedicated to agriculture

With the end of the Project's operational activities and the decommissioning of infrastructure, the population may regain access to lands that were used for the port terminal. It is unlikely, however, that these lands will be entirely converted to agricultural spaces, given the high likelihood of soil degradation and technical difficulties in restoring its fertility.

The rice paddies located between the conveyor and the Dougoufissa estuary, however, will once again become accessible to the communities.

This impact will be low during the closure phase and would have medium sensitivity, therefore the significance of the impact will be minor.

Improvement measures to consider, in the framework of the rehabilitation and closure plans would be:

- to rehabilitate, as much as possible, the old croplands (leveling and decompacting the substrate, bringing in arable land and fertilizing, replanting, etc.); and
- to clarify the legal status of lands that may be freed and the "ownership and usage" rights associated with them.

The residual impact remains minor, because the magnitude of this impact remains low.

Table 16.26 Port area - impacts on agriculture during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Increase in areas dedicated to agriculture	*Minor*	- to rehabilitate, as much as possible, the old croplands (leveling and decompacting the substrate, bringing in arable land and fertilizing, replanting, etc.). - to clarify the legal status of lands that may be freed and the "ownership and usage" rights associated with them.	*Minor*

16.2.4.6 Impacts on fishing and access to natural resources

Improvement on the quality and the conditions for access to the water

In the Project's closure phase, it is anticipated that a certain number of people will leave the city of Kamsar in order to go look for work opportunities in other cities or regions. Additionally, the pressure on water infrastructure for the city is expected to substantially decrease.

In addition, the end of the Project's industrial activity may positively influence the quality of surface waters in the direct environment of the port terminal.

This impact will have a low magnitude during the closure phase and would have medium sensitivity, therefore the significance of the impact will be minor.

The main improvement measure consists of assuring the development of sustainable hydraulic infrastructure adapted to the needs of the people (training to upkeep and maintain, and managing the maintenance funds, etc.) throughout the Project.

The residual impact will be moderate. More people will in effect have access to the water thanks to the implementation of these measures.

Revitalization of the fishing sector

The reduction of vessel traffic in the estuary and of dredging activities may substantially increase the mobility of fishermen around Kamsar.

The same factors, as well as the end of the Project's industrial activities in the port terminal may also diminish the physical and chemical disruptions of the marine environment and lead to a progressive improvement of the quality and quantity of fish stocks.

Further, with the end of the Project, the former demobilized workers may engage in the fishing sector, that is relatively independent of local economic conditions (and therefore of the possible wave of recession, that might follow the Project's closure) as mainly focused on exporting in the rest of the country and the neighboring countries.

This impact will be low during the closure phase and would have medium sensitivity; therefore the significance of the impact will be minor.

The main improvement measure consists of supporting the fishing sector throughout the operations phase of the Project (developing infrastructure, diversification of methods and products - shellfish -, support of material and equipment, support of commercial and transformational activities of women, etc.).

The residual positive impact will be moderate. These measures will have the effect of maximizing the positive results in this sector during the closure phase.

Table 16.27 Port area - impacts on fishing and access to natural resources during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement on the quality and the conditions for access to the water	*Minor*	- To assure the development of sustainable hydraulic infrastructure adapted to the needs of the people (training to upkeep and maintain, and managing the maintenance funds, etc.) throughout the Project.	*Moderate*
Revitalization of the fishing sector	*Minor*	- To support the fishing sector throughout the operations phase of the Project (developing infrastructure, diversification of methods and products, support of material and equipment, support of commercial and transformational activities of women, etc.).	*Moderate*

16.2.4.7 Impacts on the local socioeconomic context

Risk of local economic recession

The lowering of general demand brought about by the loss of the purchasing power of the Project's workers and the foreseen phenomenon of job seekers and demobilized workers emigrating may slow the local economy, and even cause it to fall into a recession phase. The local small and medium-sized enterprises whose main client was the Project would lose their work opportunities.

However, this risk is mitigated by the relative diversity of the local economy (fishing, commerce, service and agricultural sectors, etc.) and a lowered dependence on the mining sector than what will probably develop in the mining area.

The impact will have a medium magnitude and receptors have high sensitivity. Its significance would therefore be major.

In order to mitigate this impact, the Project will need:

To reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives:

- to provide a retraining strategy for the Project's employees: putting in place of saving schemes, training courses, support in job-seeking);
- to support throughout the Project the diversification of income-generating activities (regarding the already well-performing sectors of, specifically, fishing and agriculture) the reinforcement of local enterprises and training courses for the population and focused on diversified sectors, in a way that the economic activity of the area does not depend only on the mining sector; and
- to support the local authorities in putting in place an information campaign on the closure of the Project so that the population can anticipate the phenomenon.

The residual impact will be moderate. These measures will allow the risk of recession to be anticipated before the closure of the Project and thus limit the cause.

Decrease in local development initiatives

Upon closure, the public revenue will reduce due to the fact that the Project will cease to pay the taxes due for the mining production, to pay into the LDF and to put in place community development projects financed using own funds.

The magnitude of this impact is considered large and its receptors sensitivity high. Its significance is therefore major.

In order to mitigate this impact, the Project will need to ensure programs of its Local Development Plan are developed with the aim to ensure long-term sustainability of its programs or benefits, in particular:

- to assure, throughout the Project, different development projects undertaken by the communities;
- to provide sustainable development projects;
- to ensure local authorities maintain any new infrastructure;
- to support the authorities in improving the budgetary management over the long-term; and
- to support the authorities in putting in place information campaigns on the closure of the Project so that the negative effects can be anticipated.

The residual impact will remain major. These measures would anticipate the risk of existing development projects becoming weak throughout the construction and operations phases.

Table 16.28 Port area - impacts on local socioeconomic context during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Risk of local economic recession	*Major*	- To reinforce the Project Local Development Plan objective and programs in particular with regard to the following objectives : • to provide a retraining strategy for the Project's employees: putting in place of saving schemes, training courses, support in job-seeking); and • to support throughout the Project the diversification of income-generating activities (regarding the already well-performing sectors of, specifically, fishing and agriculture) the reinforcement of local enterprises and training courses for the population and focused on diversified sectors, in a way that the economic activity of the area does not depend only on the mining sector; and • to support the local authorities in putting in place an information campaign on the closure of the Project so that the population can anticipate the phenomenon.	*Moderate*
Decrease in local development initiatives	*Major*	- To ensure programs of its Local Development Plan are develop with the aim to ensure long-term sustainability of its programs or benefits, in particular: • to assure, throughout the Project, different development projects undertaken by the communities; • to provide sustainable development projects; • to ensure local authorities maintain any new infrastructure; • to support the authorities in improving the budgetary management over the long-term; and • to support the authorities in putting in place information campaigns on the closure of the Project so that the negative effects can be anticipated.	*Major*

16.2.4.8 Impacts on health and safety

Reduced pressure on infrastructure

We can anticipate a wave of migrations (departures) of the population from the city of Kamsar and therefore a fall in pressure on basic services (health and water) in the area during the closure of the Project. The achievements in infrastructure would benefit more directly resident populations in the city.

The magnitude of this impact is considered low and its receptors sensitivity high. The significance of the impact is therefore moderate.

To reinforce this impact, the Project will have to support the local authorities to assure the sustainability of the structures related to health throughout the Project so that they do not decline at the time of the closure - continuous training of health staff, training in upkeep and maintenance, support to the management of the education structures on management methods.

The residual impact will be of major significance to the magnitude extent that these measures would ensure continuity of access to quality health infrastructure.

Deterioration in access to healthcare

As in the mine area, the reduction in the budgets dedicated to local development may entail a deterioration of the healthcare services due to a lack of upkeep that would have been put in place throughout the Project. Further, the risk of impoverishment of households related to the closure of the Project will undoubtedly limit their possibilities of paying for healthcare expenses.

In parallel, due to a fall in demand for healthcare related to a potential population decline and to the impoverishment of households due to the demobilization of the workers and therefore the overall fall in demand in the area, the private healthcare centers might close.

The magnitude of this impact is considered medium and its receptors sensitivity high. The significance of the impact is therefore major.

To mitigate this impact, it will be fitting to aim at the sustainability of the healthcare structures throughout the Project so that they do not decline at the time of the closure: continuous training of the healthcare personnel, training in upkeep and maintenance, support in management.

The residual impact is considered moderate to the magnitude extent that these measures will sustain health care after the closure of the Project.

Reduction in diseases related to the mining activity

As in the MA, the closure of the mining activities in the port should be concomitant to a reduction in diseases related to air pollution, noise pollution and even diseases related to water and sanitation. Several factors explain this:

- reduced risk of industrial accidents and discharges of industrial effluents (including fuel) in the natural habitat;
- reduction in sources of dust emissions (handling bauxite); and
- reduction in noise and vibration levels associated with the mining activities (movement of trains, conveyor of bauxite, etc.).

This impact will have a medium magnitude during the closure phase, and its receptor a high sensitivity. The significance of the impact will therefore be major.

The planned improvement measures to optimize the significance of this impact are:

- to return the chemical products to the suppliers when possible, to eliminate them appropriately according to the manufacturer's requirements as appropriate;
- to empty the fuel tanks and decommission the tanks; and
- to excavate and treat/eliminate possibly contaminated soil.

The significance of the impact will remain major with the implementation of the improvement measures. These measures will help to maximize the positive impact caused by the closure phase.

Risks to the safety of populations

Following the Project's closure, the demobilized workers will find themselves without a job. The deterioration of the economic situation of these people and their homes could be at the origin of the development of petty crime and lead to increased risks for the population of Kamsar in terms of safety.

Furthermore, at abandonment the port terminal could become potentially dangerous to people living nearby (hazardous materials, protruding metal parts, etc.).

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

The following measures will allow for mitigating this impact.

- to carry out awareness-raising actions with the GAC workers and its subcontractors to fight against delinquency ahead of the closure of the Project;
- to support the public authorities to assure a good level of public security;
- to ensure the safety of the Project's infrastructure to limit inadvertent penetrations that could generate accidents; and

- to systematically decommission the infrastructure and the installations of the Project, apart from those that may be of interest for the local community.

The residual impact will be minor.

Improvement to road safety conditions

The Closure phase should coincide with a significant improvement in road safety in Kamsar, due to the decrease in the movement of machines and Project vehicles and vehicles of demobilized workers who leave the area, and the stopping of the movement of ore transport trains.

This impact will have a low magnitude during the closure phase, and its receptor a medium sensitivity. The significance of the impact will therefore be minor.

The planned improvement measures to optimize the significance of this impact that could be implemented during the operation phase to prepare the closure phase are:

- local authorities to maintain a highway code in the area (speed limits, sign boards, etc.); and
- local authorities to continue awareness campaigns of the population in terms of road safety issues, in collaboration with national and international NGOs.

The implementation of these improvement measures will result in a moderate residual impact during the closure phase since these measures will sustain good road safety conditions.

Table 16.29 Port area - impacts on health and safety during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduced pressure on infrastructure	*Moderate*	- To support the local authorities to assure the sustainability of the structures related to education throughout the Project so that they do not decline at the time of the closure - continuous training of teaching staff, training in upkeep and maintenance, support to the management of the education structures on management methods.	*Major*
Deterioration in access to healthcare	*Major*	- To aim at the sustainability of the healthcare structures throughout the Project so that they do not decline at the time of the closure: continuous training of the healthcare personnel, training in upkeep and maintenance, support in management.	*Moderate*
Reduction in diseases related to the mining activity	*Major*	- To return the chemical products to the suppliers when possible, to eliminate them appropriately according to the manufacturer's requirements as appropriate. - To empty the fuel tanks and decommission the tanks. - To excavate and eliminate possibly contaminated soil.	*Major*
Risks to the safety of populations	*Moderate*	- To carry out awareness-raising actions with the GAC workers and its subcontractors to fight against delinquency ahead of the closure of the Project. - To support the public authorities to assure a good level of public security. - To ensure the safety of the Project's infrastructure to limit inadvertent penetrations that could generate accidents. - To systematically decommission the infrastructure and the installations of the Project, apart from those that may be of interest for the local community.	*Minor*
Improvement to road safety conditions	*Minor*	- Local authorities to maintain a highway code in the area (speed limits, sign boards, etc.). - Local autorities to continue awareness campaigns of the population in terms of road safety issues, in collaboration with national and international NGOs.	*Major*

16.2.4.9 Impact on education

Reduced pressure on education infrastructure

It is possible, when the Project is closed, that households leave the area with their children. Consequently, the pressure on the education system will reduce provided that they continue to operate after the closure of the Project.

The magnitude of this impact is considered medium and its receptors sensitivity high. The significance of the impact is therefore major.

To reinforce this impact, the Project will have to support the local authorities to assure the sustainability of the structures related to education throughout the Project so that they do not decline at the time of the closure - continuous training of teaching staff, training in upkeep and maintenance, support to the management of the education structures on management methods.

The residual impact will be major to the extent that these measures would ensure continuity of access to quality education infrastructure.

Deterioration of access to education

As in the mine area, the closure of funds for community development in the area could cause a significant slowdown in investment in the education sector. It is therefore possible that the quality of the infrastructure dedicated to education deteriorates. The number of pupils might also fall insofar as households suffering in a context of a market downturn will probably no longer have the means to send their children to school. Girls are particularly exposed to this risk.

In parallel, the private education structures might suffer from the departure of some households and from the potential impoverishment of the population. In the absence of a sufficient number of pupils, these structures might be forced to close their doors.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

To ensure programs of the Local Development Plan are develop with the aim to ensure long-term sustainability of its programs or benefits, in particular:

- to support throughout the Project the diversification of income-generating activities, the reinforcement of local enterprises and training courses for the population and focused on diversified sectors, in a way that the economic activity of the area does not depend only on the mining sector; and
- to support the local authorities to sustain the education systems throughout the Project so that they do not decline at the time of the closure: continuous training of the teaching staff, training in upkeep and maintenance, support in management.

The residual impact will be moderate. These measures will in fact allow a continuation of access to education for a larger number of students, reducing the significance of the impact.

Table 16.30 Port area - impacts on education during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Reduced pressure on education infrastructure	*Major*	- To support the local authorities to assure the sustainability of the structures related to education throughout the Project so that they do not decline at the time of the closure - continuous training of teaching staff, training in upkeep and maintenance, support to the management of the education structures on management methods.	*Major*
Deterioration of access to education	*Moderate*	- To ensure programs of the Local Development Plan are developed with the aim to ensure long-term sustainability of its programs or benefits through: • To support throughout the Project the diversification of income-generating activities, the reinforcement of local enterprises and training courses for the population and focused on diversified sectors, in a way that the economic activity of the area does not depend only on the mining sector. • To support the local authorities to sustain the education systems throughout the Project so that they do not decline at the time of the closure: continuous training of the teaching staff, training in upkeep and maintenance, support in management.	*Moderate*

16.2.4.10 Impacts on mobility, flows and transport

Improvement of traffic conditions

Stopping traffic of bauxite transport trains, ore ships and vehicles and equipment for the Project should have a positive impact for decongestion of traffic in Kamsar, both on land and sea. With train traffic reduced (as some others operators use the facilities), some outlying districts of the city located in the South of the rail could be even desenclaved.

GAC, throughout the operation phase, would have contributed to the maintenance of these tracks and roads and strengthened the system of road signs and signals in its Project, therefore the impacts on mobility, flows and transport would be even more positive.

This impact will have a medium magnitude during the closure phase, and its receptor a low sensitivity. The significance of the impact will therefore be minor.

The planned improvement measures to optimize the significance of this impact are:

- to support local authorities to sustain transport infrastructure developed throughout the Project; and
- to support the local authorities in the maintenance of a public transport system and the improvement of the private transport system (bus shelters, train station, signs, etc.).

The significance of the positive impact will be moderate with the implementation of these improvement measures that will sustain correct traffic conditions.

Table 16.31 Port area - impacts on mobility, flows, and transport during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of traffic conditions	*Minor*	- To support local authorities to sustain transport infrastructure developed throughout the Project; and - To support the local authorities in the creation of a public transport system and the improvement of the private transport system and their related infrastructure (bus shelters, train station, etc.).	*Moderate*

16.2.4.11 Impacts on cultural heritage

The impact on the cultural heritage will be negligible, as the Project's activities during the closure phase will take place in areas having already been invested previously by the operating activities of the Project.

16.2.4.12 Impacts on living conditions and the landscape

Improvement of living conditions and the landscape

During the closure phase, the impacts on living conditions and the landscape should be positive. The end of the activities may allow the communities to enjoy a more peaceful environment. The sources of dust emission will be reduced. The decommissioning of the port terminal, the conveyor and the jetty and the end of the operating of bulk carriers in the estuary of the Rio Nuñez will have a significant impact on the landscape.

This impact will have a medium magnitude and low sensitivity. The significance of the impact will therefore be moderate.

The planned improvement measures to optimize the significance of this impact are:

- to declassify and decommission systematically the Project's infrastructure and installations (including the administrative buildings and the accommodation structures for employees), apart from those that would be of interest for the surrounding communities; and
- to restore and revegetate Project areas (reforestation).

The implementation of these improvement measures will entail a major residual impact during the closure phase. These measures will help limit the physical traces related to the presence of the Project.

Table 16.32 Port area - impacts on living conditions and landscape during the closure phase

Impact	*Significance*	Improvement / mitigation measures	*Residual significance*
Improvement of living conditions and the landscape	*Moderate*	- To declassify and decommission systematically the Project's infrastructure and installations (including the administrative buildings and the accommodation structures for employees), apart from those that would be of interest for the surrounding communities. - Restore and revegetate Project areas (reforestation).	*Major*

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17.1 INTRODUCTION

This section presents the assessment of cumulative impacts that would result from the combination of the Project with other actual or proposed future developments the mine Project area. The analysis of the cumulative impacts is designed to anticipate past, present or future project actions that can interact with the Project in a cumulative manner and generate significant changes.

17.2 LEGAL FRAMEWORK AND INTERNATIONAL STANDARDS

In chapter III of the Mine Code (2011), there is a mention concerning *"relations between mines and nearby quarries"*:

- Work of common interest (Article 115): "if necessary, the mining title holder cannot oppose participating (in proportion to its interests) in the performance of the work designed to implement communication from nearby mines (ventilation needs, flow of wastewater, transport or relief to neighboring mines)".

- Civil liability (Article 116): "When the work of the holder of a mining title or permit causes damage to the activities of the holder of a mining title or authority, reparation is due to the latter under the conditions of ordinary law for Civil Liability".

There is no mention of obligations related to socioeconomic cumulative impacts in the Guinean legal framework.

The International Finance Corporation (IFC) standards for the assessment of cumulative impacts are contained in the document entitled "*International Financial Corporation, Good Practice Note - Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets, 2012*" (IFC, 2012) and AfDB OS 1 (2013). Advanced standards recommend that the assessment of

cumulative impacts takes into account available data on the initial state for the study area. A process similar to the SEIA methodology should be applied to the analysis of the cumulative impacts and should incorporate risk and potential impacts from past projects, as well as any project likely or potential at a regional level. As part of the SEMP, regional mitigation measures will be identified and developed in collaboration with regional stakeholders, representatives of the Government and representatives of the other projects included in the cumulative effects for the study area.

17.3 STUDY LIMITS

The level of disturbance produced from the cumulative impacts takes into account its deferred or synergistic effects. Beyond the simple relationship of cause and effect, they can amplify the disruption of an element when the environment is particularly sensitive. The objective, to the magnitude possible, is to consider the superimposition of major spatial and temporal effects induced by the entry in construction, in operation and closure of several industrial projects on the same territory. Thus, the multiplicity of stakeholders in the region could lead to a rapid development of this region (that means that the Project is not solely responsible for the mitigation of impacts).

The assessment of cumulative impacts encounters several types of significant limitations, such as:

- **Spatial limits:** the environmental impact assessment has always been the definition of more or less arbitrary limits surrounding the location of an action. These limits are often local and restricted to the effects of a single action so that they could have wider effects

- **Temporal limits:** the determination of limits, past and future, of an assessment depends on the specific purpose of the assessment. To compare incremental changes over the years, we must consult historical records to establish a reference point. If there is the possibility that new actions occur, we must consider the future. In practice, often the temporal limits reflect first the useful life or the stages of the action under review (for example, exploration, construction, operation, closure), and then extend to represent the duration of all the actions arising from the increasing regional development. In both cases, scenarios are frequently linked to a single year or for a given number of years.

- **Dimensional limits:** the variation of size of the projects present an ambiguity for the rigorous assessment of cumulative impacts insofar as certain projects may be small or on the contrary, of very large sizes - identifying their impacts could therefore be difficult.

- **Typological limits:** the fact that there are different types of projects in the study area is problematic for the consistency of methodologies and the assessment criteria used in different projects.

- **Operational limits:** the uncertainty of the deadlines for start-up of projects or their stoppage at a certain phase of their implementation or the development of the projects during their implementation, present an obstacle to determine the significance of this Project in the assessment; and

- **Political limits:** these limits are expressed by the lack of cooperation of some projects for sharing environmental and social technical data to undertake the assessment of cumulative impacts of the Project, and the sensitivity of the publication of certain information that can lead to negative consequences for certain stakeholders.

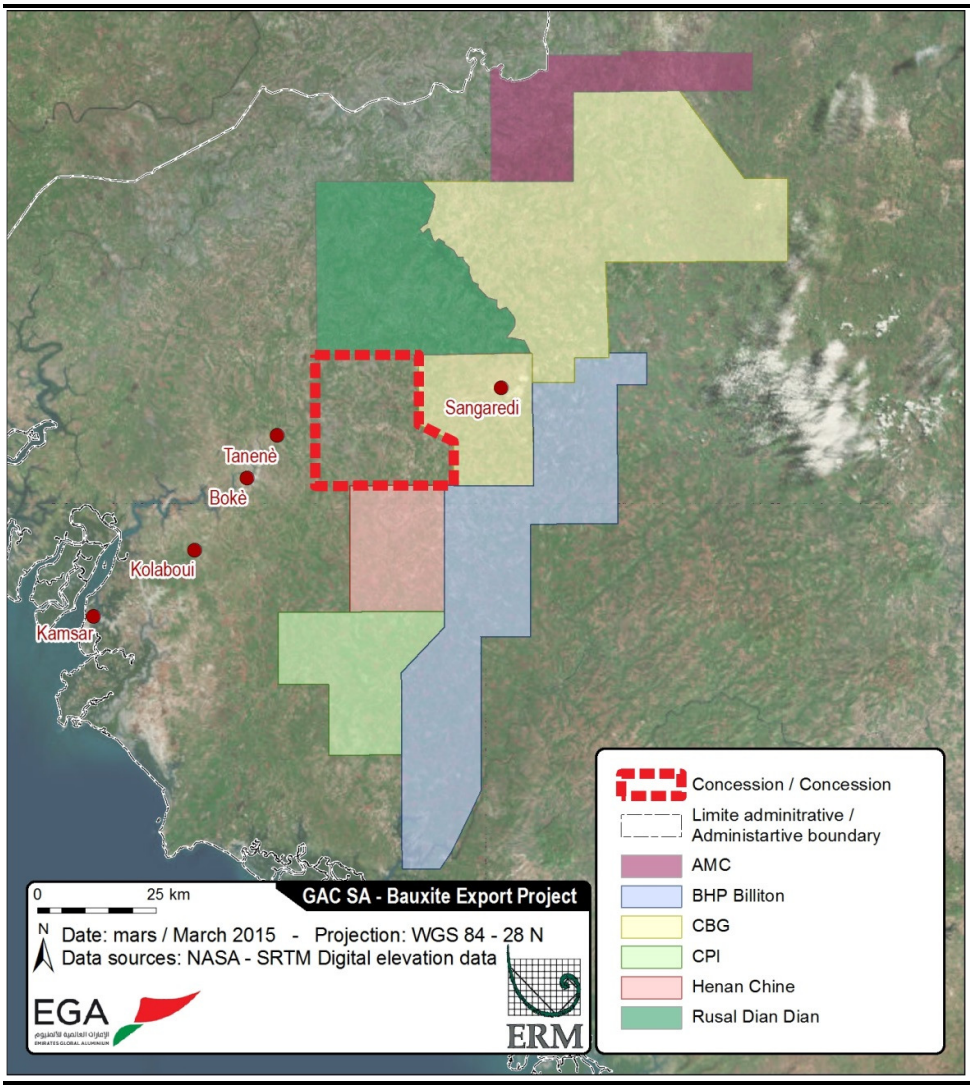
Therefore, the limited availability of accurate information restricts the assessment of cumulative impacts in qualitative analysis of convergence / divergence of impacts.

17.4 PROJECTS CONSIDERED

Projects considered (*Figure 17.1*) for the cumulative impacts assessments are the following:

- Compagnie des Bauxites de Guinée ('CBG') ;
- Compagnie des Bauxites de Dian Dian ('COBAD', a subsidiary of Rusal) ;
- China Henan International Cooperation Group (hereafter 'Henan') Boké permit area (future project) ;
- China Power Investment Corporation (CPI) ;
- Kabata – Alcoa/Rio Tinto Alcan;
- BHP Billiton ; and
- Koumbia – AMC.

Figure 17.1 Other current and future projects in the vicinities of the Project area



17.5 MINE AREA

17.5.1 Introduction

This section presents the assessment of cumulative impacts that would result from the combination of the Project with other actual or proposed future developments at the mine Project area. All known future projects are related to mining activities (new mines or existing mine extensions). Typical bauxite mining activities are expected to be operated by these projects and typical infrastructures (haul roads, crushing plants, rail spurs) are expected to be constructed. For most of these projects the development schedule and the ore production is not yet fixed or known.

Projects that have the potential to generate cumulative impacts with the mine area are listed below and shown in *Figure 17.1*:

- Compagnie des Bauxites de Guinée ('CBG') mining operations on a concession area at and around Sangarédi (existing operation and anticipated future developments): it is located on the eastern border of GAC concession, although there is no official information for its potential expansion.

- Compagnie des Bauxites de Dian Dian ('COBAD', a subsidiary of Rusal) permit area (future project, currently under development): located north of GAC's concession border, at more than 10 km from the GAC bauxite export project proposed mining area (Plateaus 20), and 15 km away from GAC's proposed mine processing facility. The SEIA was submitted to BGEEE on February 2015. The construction of the plant has been postponed to the second phase of the Project before the end of 2019.

- China Henan International Cooperation Group Boké permit area (future project): located south of GAC concession border. Plateaus 36-37-26-31 partially confine with it, whilst all the other plateaus are located at more than 1.5 km. GAC's proposed mine processing facility is more than 12 km away.

- China Power Investment Corporation (CPI): located south of Henan permit area, approximately 40 km from the southern border of GAC' concession. The BGEEE issued the environmental permit in 2013.

- BHP Billiton: located along the south east border of GAC concession area.

- Later development of GAC's mining plateau in the southern and northern parts of GAC's concession to provide bauxite feed for an alumina refinery (the refinery would likely be located at GAC's concession area).

- Koumbia - AMC: the Project plans to begin export of bauxite to a maximum of 4 mtpa in 2016 with an objective of export of 10 mtpa as soon as 2018. Bauxite would be exported via a rail road of about 140km, and then from a river port on the Rio Nuñez near Boké. Barges will carry a floating port in deep water to load ships of 150,000 tons and able to deliver the bauxite until the Far East.

Above listed projects are considered including infrastructures construction (roads, railway, etc.) and associated potential environmental and social impacts.

17.5.2 Cumulative impacts on air quality

17.5.2.1 Introduction

The main sources of atmospheric emissions in the broader Project area are expected to arise from other actual and nearby existing (CBG) or future (COBAD, AMC, Henan) mining projects.

Overall, the following emissions are expected from these projects:

- dust emissions from mining activities such as drilling, blasting ore-handling, crushing, transport, stockpiling and ore-processing;

- dust re-suspensions from unpaved roads such as haul road and material handling, e.g. ore-handling, transport and stockpiling; and

- exhaust emissions (primarily NOx, SO_2 and PM) due to combustion of fossil fuels from the vehicle traffic exhausts (i.e. in-pit haul trucks, dozers, excavators, crushers and drills), and to diesel-fired electricity generators likely to be used to meet the electricity generation needs.

No detailed information on Project development and related atmospheric emissions are available on the neighboring concessions with the exception of COBAD, for which an SEIA has been already issued, albeit with limited numerical assessment of potential impacts to air quality. For this reason, the assessment of cumulative impact was primarily based on the outcome of the atmospheric dispersion modeling study performed for GAC.

The assessment of cumulative impacts was structured in the following two steps:

- Identification of the areas/receptors most likely to undergo cumulative impacts. This identification took into account:
  - the spatial location of predicted impacts and the distance from the emissions source where impacts are most likely to occur; and

  - the location of GAC emission sources with respect to GAC's concession borders.

- Evaluation of the magnitude of predicted impacts at receptors located in the areas most likely to be affected by cumulative impacts.

Cumulative impacts are most likely to occur and be critical for long-term concentrations (e.g. annual averages). Short-term concentrations (e.g. hourly/daily concentrations) are subject to a high variability during the year since they are dependent on specific micro meteorology. For this reason, the qualitative assessment of cumulative impacts in the short-term is highly unpredictable and the assessment presented in this section only refers to long-term concentrations.

It should be noted that according to Project information currently available, haul roads located inside GAC's concession will be only used by GAC's staff. Hence, no cumulative impacts are expected on haul roads.

17.5.2.2 Spatial analysis of cumulative impacts on air quality

The atmospheric dispersion modeling activities performed for GAC highlighted that long-term impacts are mostly confined within GAC's concession boundary.

In particular, the biggest impacts occur in close proximity of the emission sources.

GAC emission sources of both exhaust gases (primarily NOx and SO_2, and secondarily PM_{10}) and dust (PM_{10}) are located in the plateaus and at the crushing plant. *Table 17.1* summarizes the distances between GAC emission sources and GAC concession borders.

Table 17.1 Distances between GAC emission sources and GAC concession borders

GAC Project emission sources	Northern Concession Border (GAC – COBAD)	Eastern Concession Border (GAC- CBG - Rusal)	Southern concession border (GAC- HENAN Boke permit)
Plateaus (Mineral extraction and haulage of ore and overburden)	The closest plateau is Plateau 20, located at a distance of ≈ 10 km from the border. All other plateaus are located at distances greater than 10 km from the border.	The closest Plateau is plateau 34, which is partially on the border. Plateau 37 and 33 are located at a distance of ≈ 3.5 km from the border. All other plateaus are located at distances greater than 3.5 km from the border.	Four plateaus (36-37-26-31) are partially on the border. Plateaus 27, 32 and 34 are located at a distance of a≈ 1.5 km from the border. All other plateaus are located at distances greater than 1.5 km from the border.
Crushing Plant and Power generation	≈ 15 km	≈ 14 km	≈ 12 km

GAC emission sources are located at a distance of at least 10 km from GAC's northern concession border. In light of the outcome of the atmospheric dispersion modeling studies it is anticipated that emissions will disperse between Projects avoiding significant cumulative impacts. Therefore cumulative impacts from the combination of GAC and COBAD emission sources can be reasonably excluded in light of the considerable distance between the two Projects.

With regard to CBG concession to the east, the border of Plateau 34 partially coincides with GAC concession border. Likewise, the borders of four GAC Plateaus (36-37-26-31) partially coincide with GAC concession border. There is currently no information on the location of CBG and Henan Boké emission sources. In case they are located next to the border with the GAC concession cumulative impacts should be expected at receptors located next to the border. Cumulative impacts would be associated with the generation of dust, PM_{10} from mining activities/haulage and with the generation of exhaust gases (NOx SO_2, and PM) from the mining equipment. Other plateaus and the crushing plant (except for COBAD) are located at a considerable distance from the border, thus they are less likely to contribute to cumulative impacts. In addition, the COBAD crushing plant, road and railway will be located within the CBG concession,

approximately 1 km from the eastern border of GAC's concession. Cumulative impacts associated with the generation of dust and PM_{10} from these activities are anticipated.

By considering only the spatial location of GAC emission sources and the outcome of the performed atmospheric dispersion modeling studies, the following conclusions can be drawn:

- Cumulative impacts from the combination of GAC and COBAD Dian Dian can reasonably be excluded, except for the crushing plant, road and railway that will be located on the CBG concession, approximately 1 km from the eastern border of GAC's concession.

- Cumulative impacts from the combination of GAC and CBG might occur at receptors located next to the portion of plateau 34 located on the concession border; in particular cumulative impacts should be primarily expected at the receptors already affected by minor, moderate or major impacts as reported in *Section 17.5.2.3*.

- Cumulative impacts from the combination of GAC and Henan Boké might occur at receptors located next to the portion of plateau 36, 37, 26, 31 located on the border; in particular cumulative impacts should be primarily expected at the receptors already affected by minor, moderate or major impacts as reported in *Section 17.5.2.3*.

- Emissions from the crushing plant and power generation are unlikely to generate any cumulative impact, due to the distance of the crushing plant from GAC's concession borders.

17.5.2.3 Assessment of cumulative impacts on air quality

The atmospheric dispersion modeling activities performed for GAC quantified the ground level concentration of pollutants (NO_X, SO_2 and PM_{10}) induced by the Project.

With regard to cumulative impacts the IFC general EHS Guideline for air emissions and ambient air quality states that:*"…Projects with significant sources of air emissions, and potential for significant impacts to ambient air quality, should prevent or minimize impacts by ensuring that: […] Emissions do not contribute a significant portion to the attainment of relevant ambient air quality guidelines or standards. As a general rule, this Guideline suggests 25 percent of the applicable air quality standards to allow additional, future sustainable development in the same airshed."*

Based on this criterion, the assessment of cumulative impacts focused on GAC long-term modeling results in the areas where cumulative impacts are most likely to occur, thus along the southern border of the GAC concession and on the eastern border of the GAC concession at the height of plateau 34.

The assessment evaluated whether the contribution of GAC at receptors located in these areas is below or above the 25 percent of applicable air quality standards, thus whether future sustainable development is allowed or not in accordance with IFC. In general, at receptors where predicted impacts are negligible, future developments are allowed and significant cumulative impacts can be reliably excluded.

GAC contribution at receptors located outside the GAC concession limit in the areas likely to undergo cumulative impacts is always below the 25% of the applicable long-term air quality standard for NO_2, SO_2 and PM_{10}. Therefore, according to the IFC, future sustainable development in the same airshed is allowed and significant cumulative impacts should be excluded.

With regard to receptors located inside the GAC concession limit next to the southern and to the eastern borders of GAC concession, GAC contribution is generally below the 25% of the applicable long-term air quality standards for NO_2, SO_2 and PM_{10}.

Along the southern border of GAC's concession, higher contributions of NO_2, SO_2 and PM_{10} leading to t impacts (major, moderate or minor) are observed at the villages of Bowall Dansouba and Kerenmara. The latter are located at a distance of at least 2 km from the concession borders, so they are unlikely to undergo significant cumulative impacts.

Along the eastern border of GAC's concession, higher contributions of NO_2, SO_2 and PM_{10} leading to impacts (major, moderate or minor) are predicted at the villages of Sadjaly and Sindiare Missidè. The latter are located right next to the concession border and are likely to undergo cumulative impacts. The significance of these impacts depends on the future development of CBG Project and the location of its emission sources. Significant impacts should be expected only if GBC emission sources are located in the close proximity of the villages of Sadjaly and Sindiare Missidè.

17.5.3 Cumulative impacts on greenhouse gas

GHG emissions contribute to global warming, and have inherently a cumulative impact. Major greenhouse gases are well mixed and take several years to leave the atmosphere. In other words, they have no borders, and their effect on climate change is the same independently from the point of emission. Therefore, project-related impacts of GHG emissions are treated as one-in-the-same as cumulative impacts.

17.5.4 Cumulative impacts on noise and vibrations

Based on IFC definition, cumulative impacts from noise emissions can occur as a result of overlapping impacts on the acoustic environment generated by a number of separate sources in a limited area (e.g. increased noise levels in a community from several industrial developments, existing and new roads; combined effect of individual impacts on particular receptors). Cumulative

impacts of surrounding industrial facilities, both existing and on development may result in future exceedances of noise criteria.

The main sources of noise emissions in the broader Project area are expected to arise from other mining Projects, such as COBAD Dian Dian, Henan Boké and CBG, and in relation to mine excavation works and processing, haul road transportation, and railway operations.

No cumulative impact related to vibration is expected to occur since vibration effects attenuate very quickly over distance (e.g. human annoyance threshold is not triggered above a distance of 100 m for vibrations) and these other projects are located sufficiently far from GAC noise emission sources.

17.5.4.1 Mining and processing operations

The noise modeling activities performed for GAC highlighted that the impacts are mostly confined within GAC's concession boundary. In particular, the highest impacts occur in the close proximity of the mine pits and crushing plant.

GAC emission sources are located at a distance of at least 10 km from the northern GAC concession border; in light of the outcome of the noise modeling studies it is anticipated that noise emissions will be limited to the near surroundings of the mine pits and the crushing plant. In addition, the COBAD crushing plant is planned to be installed close to the eastern border of GAC concession at approximately 14 km from GAC crushing plant. Therefore cumulative impacts from the combination of GAC and COBAD emission sources can reasonably be excluded.

The borders of four GAC Plateaus (36-37-26-31) partially coincide with the Henan Boké permit border. Therefore GAC emission sources are most likely to contribute to cumulative impacts at receptors located in the proximity of the southern border of GAC's concession, between GAC and Henan Boké permit. Significant cumulative impacts will arise only in case of a concomitance of activities in place at the border of the two projects' concession areas. Given the great distance between the crushing plant and Henan Boké permit, cumulative impacts will not arise between GAC processing operations and Henan Boké permit activities.

With regard to the interaction between GAC and the CBG concession (under development) to the east, potential cumulative impacts may arise only in case of a concurrence of activities at Plateaus 34, operated by GAC, and at the CBG border. Since there is currently no information on the location of CBG emission sources, only in case they will be located next to the border with GAC cumulative impacts should be expected at receptors located on the border. Other plateaus and the crushing plants are located at a considerable distance from the border, thus they are not likely to contribute to cumulative impacts.

17.5.4.2 Haul roads transportation

Noise emissions from road traffic are related to trucks' movements on haul roads within the concession area. These roads will only be used by GAC staff for transportation of ore from the pits to the crushing plant. For this reason, no cumulative impacts are predicted.

17.5.4.3 Railway operations

Significant cumulative impacts related to the railway operations are likely to occur due to the interaction of the activities of GAC with other future developments. In particular, this may increase the noise disturbance and annoyance at sensitive receptors located along the railway in the proximity of GAC concession, resulting in a larger footprint area where exceedances of IFC noise criteria may occur.

The railway from GAC concession area to Kamsar port terminal is currently operated by CBG, with assumed rail traffic of about five or six trains per day (*ESIA, 2008*) to ship the extracted materials to the CBG port facility in Kamsar.

The noise contribution of CBG to the existing acoustic climate can be assessed on the basis of the monitoring survey performed in the proximity of the rail path. Monitored data highlighted a significant increase of the noise levels during the transit of cargo trains, resulting in an exceedance of the IFC noise criteria both for daytime and night time (as described in *Section 6.3*).

The increase of railway traffic, due to the operations of ore transportations from GAC, CBG, AMC and COBAD concessions to the port area, is likely to result in significant cumulative impacts in correspondence of the sensitive receptors located in the proximity of the railway tracks.

17.5.4.4 Reduction of cumulative noise impacts

Overall, to reduce cumulative noise impacts, each proponent should take all reasonable and feasible measures to ensure that the noise generated by their project remains as low as reasonably practicable, in line with applicable noise criteria.

17.5.5 Cumulative impacts on the landscape

This site-specific landscape assessment encompasses the analysis of surrounding landscape sensitivities and potential visual receptors as included in the Project's area of influence.

The presence of other existing projects within the Area of Influence is therefore analyzed within the landscape sensitivity, allowing a cumulative assessment of impacts of Project's activities on landscape.

This assessment is limited to the currently developed projects and does not include future developments from other project, given the lack of

understanding on planned or reasonably defined developments in the area of influence of GAC's project. This allows a partial assessment of cumulative impacts which are defined as "*impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned, or reasonably defined developments at the time the risks and impact identification process is conducted*"(IFC PS 1).

Based on the available and limited information, the overall design and the implementation time frame of the known projects could be considered as similar to GAC. Major landscape impacts concern the loss of natural and modified vegetation in the projects area. Cumulative impacts have been assessed evaluating:

- projects distance from GAC concession and the plateaus of interest;
- landscape character like elevation profile, morphology of slopes and existing vegetation;
- available documents containing information about project components, infrastructures and mitigation measures ; and
- GAC expected mitigation measures.

It should be considered that cumulative impacts on landscape will be mainly focused on neighboring areas, where an observer can depict structures or any visual impact belonging to more than one project at a time.

Based on this, for all those areas far from the projects like AMC, CPI, southern part of BHP Billiton and north eastern part of CBG (having a distant greater than 25 km), the cumulative impacts will certainly have no contribution to Landscape aspects in the area of influence mainly due to the morphological characteristics of the local environment, the presence of natural elements like trees and the effect of meteorological conditions characterized frequently by humidity and fog reducing the horizontal view of a potential viewer.

With a specific reference to those areas located nearby the southern-eastern border of the GAC concession, the main impact on the landscape is mainly noticeable on a local scale because it affects visual perception: the closer the observer is to the project site, the more this impact is perceptible. This is valid both for single project impact and cumulative impact. Then, the areas close to the southern border of CBG, northern border of Henan Chine and central part of BHP Billiton will be characterized by a minor residual cumulative impact, assuming that the three project will run similar implementation programs and will guarantee the predisposition of mitigation measures similar to those expected by GAC in terms of effectiveness.

17.5.6 Cumulative impacts on chimpanzees

On a concession scale, GAC's project has already had an impact on large mammals and their natural habitats (e.g. Pioneer Camp alongside the Boké-Sangarédi road section, large dusty tracks mainly in the north, big area at plateau 7 cleared for the previously envisaged refinery site, opening of prospection tracks in the north, south-east and now south-west, ford created on the Tinguilinta river near Filobowal). The projects may induce the arrival of

new workers, the construction of roads, displacement of villages, the setting up of a rail loop connection, etc., which, will have a direct impact on mammals living in and around the area, especially Chimpanzees.

The new planned expansion of CBG project and the infrastructure constructed for COBAD mining operations (road, rail loading platform, rail spur) directly to the GAC concession on the east will condition the avoidance/escape behaviors of wildlife on both directions. Likewise, this is expected to happen with COBAD concession to the north of GAC concession border. If a concession is opened to the south, GAC concession would be virtually entirely surrounded by other concessions.

The habitats found in these neighboring concessions are very similar to those found within the GAC concession, and Chimpanzees are known to live in there, although no proper quantified terrestrial mammal baseline study was conducted for these other concessions. Because of the high territoriality of Chimpanzees, the cumulative impact of these mining concessions is expected to significantly affect groups' interaction potentially leading to intraspecific territorial disputes and direct loss of individuals.

17.5.6.1 Recommendations

In order to limit cumulative impacts on mammals, other projects shall implement in their ESMS the same mitigation measures that have been proposed for this Project, including offsetting schemes. GAC should liaise with the concerned operators and appropriate Guinean authorities in order to address these impacts in an integrated manner. Note that this has already been included in GAC's mitigation strategy for biodiversity impacts in the main SEIA Addendum and updated Social and Environmental Management Plan.

17.5.7 Cumulative impact assessment on terrestrial flora and vegetation

The project site is embedded within a mosaic of different and interwoven types of habitats. Natural and forested habitats have dramatically diminished due to human activities over the past. The prospective construction of other mining developments is expected to induce further land conversion practices leading to additional loss of natural habitats, disturbance of existing floral communities, and loss of specific species.

Possible cumulative habitat loss is expected to induce habitat fragmentation, especially in wooded savannah areas. Since the area around GAC concession is already highly patchy and fragmented, this impact has been considered of moderate importance.

With regards to disturbance of existing floral communities, further clearing of natural areas is expected to induce an increase of edge areas adjacent to human activities ('edge effect'). This cumulative impact has been considered as of minor importance, due to the already widespread existence of edge effects in large part of the broader area.

The cumulative impact of flora species loss has been found to be most important for the wooded savannah considering particular protection for gallery forest and inherent used of agricultural land and bowal. Current unsustainable uses within the area may be further heightened by the influx of population fueled by several large scale developments in the area in the near future. The impact of flora species loss is assessed as moderate (particularly for the Wooded Savannah). This proposed rating is consistent with the impact significance rating defined in the environmental impact assessment (see *Chapter 8*).

17.5.7.1 Recommendations

In order to mitigate these foreseen cumulative impacts, coordination between operators and local government bodies is recommended to efficiently manage the identified impacts in an integrated way. Focus should be given to preserving areas of higher conservation value, including gallery forests and areas recognized for sustaining significant population of remarkable flora or fauna species (with a particular focus on critical habitats identified for primates). This has already been included in GAC's mitigation strategy for biodiversity impacts in the main SEIA Addendum and updated Social and Environmental Management Plan.

17.5.8 Cumulative impacts on freshwater ecology

The cumulative impacts expected to occur on the freshwater ecology, of the Tinguilinta catchment and beyond, are an increase of TSS, an increase of silting, pollutions of different natures, and overfishing.

17.5.8.1 Cumulative impacts on the Tinguilinta catchment

Existing activities in the area of influence of the Project likely to affect aquatic ecology are currently limited to traditional "slash and burn" agriculture, cattle rearing, domestic water uses in the vicinity of villages, Pioneer Camp, and traffic on the main road. The baseline survey for water quality and fish biodiversity showed an overall good condition of water quality and fresh water habitats.

All catchments upstream of the GAC concession, drained by the Tinguilinta or tributaries, are entirely within adjacent bauxite mining concessions awarded to other mining companies. CBG concession covers approximately 60 % of the Kéwéwol sub-catchment, a main tributary of the Tinguilinta. This area has not been exploited yet. It has to be noted that COBAD intends to abstract raw water from Kéwéwol for the operation of its project Dian Dian, however the quantities and the way pumping operations will be managed by COBAD are not known. Henan Boké permit covers most of the upper Tinguilinta catchment upstream of the GAC concession and extends over the Fatala catchment. BHP Billiton permit covers the upper catchment of another major tributary on the right bank. Currently, no bauxite mine either in operation or in post-closure exists on the Tinguilinta catchment.

At present, the occurrence and magnitude of such developments is not predictable and will depend on several factors (e.g. ore richness of the considered areas, Guinean mining policy, price and market of bauxite at an international scale, etc.). However, it can already be anticipated that further mining developments will generate additional impacts on water resources and aquatic ecology in the Tinguilinta catchment, and induce a further deterioration of aquatic habitats and fish biodiversity, shrinkage of the linear preserved tributaries, and decrease of fish stocks. Also, the possible development of a refinery in the northern part of GAC concession would significantly increase environmental risks on aquatic habitats due to specific impacts associated with the process (water intakes, sodic wastewaters, red sludge, etc.).

17.5.8.2 Cumulative impacts beyond the Tinguilinta

At a larger scale, other bauxite mining projects in Basse Guinée, some of which being associated with refinery projects are likely to induce an impoverishment of the ecological conditions of the whole Guinean coastal rivers network, together with over factors such as demographic rise, urban and agricultural development, and increased pressure on natural resources. Some species, such as the catfish *Paramphilius teugelsi*, endemic to Basse Guinée and known from the middle and upper catchments of Kaba (Little Scarcie), Konkouré, Fatala, Tinguilinta and Kogon upper catchments, could be affected and become endangered in the long-term as a consequence of these numerous predicted industrial developments.

17.5.9 Cumulative impacts on surface water

There is a potential for cumulative impacts to occur on surface water quality and flow associated with the development of concession areas to the north and east of the GAC Project concession and as a result of impacts from the Project. The impacts of potential significance relate to water use (abstraction), management, and erosion control associated with mining developments in the headwaters of the Tinguilinta and Kéwéwol rivers. Water requirements, management (including treatment) and other additional mitigation for these projects have not been confirmed and therefore the magnitude of potential cumulative impacts is not possible to predict at this stage although it is likely to exacerbate the scarcity of water during the dry season.

The mitigation measures described within the surface water and groundwater impact assessment sections for the GAC Project will, however, ensure that the potential for increasing cumulative effects due to Project activities is avoided, minimized or compensated for. In particular, GAC will define a water management plan and water abstraction from the Tinguilinta River would be subject to restrictions with regards to necessary minimal flow to be maintained during dry season, so as to ensure communities needs and ongoing environmental downstream demands. In addition, monitoring at specific inflow and outflow points of GAC's concession will be conducted and any subsequent mitigation requirements will be identified and implemented over the lifetime of the Project.

17.5.10 Cumulative impacts on groundwater

Except for COBAD that will supply water from Kéwéwol, it is currently unknown where projects upstream of the GAC Concession area will source their water supply from, it is likely to be surface water in the first instance. It is possible that they will supplement this with groundwater in dry periods, although the abstracted volumes of groundwater are unlikely to be sufficient to cause significant cumulative effects on baseflow to the Tinguilinta or tributaries upstream of GAC's concession.

There is a potential for contamination of groundwater through upstream activities and this groundwater could potentially migrate into GAC's concession directly near the upstream boundaries, or more likely, indirectly through baseflow to surface waters. As such the mitigations in place to manage groundwater quality and surface water quality and quantity are considered, given currently available information, to be sufficient to ensure that cumulative effects are minimized or managed.

17.5.11 Cumulative impact on social component

17.5.11.1 Sources of impact

The principal potential sources of impact are:

- the potentially simultaneous start of several projects of bauxite operations and export from the maritime façade of the Boké Prefecture;
- the development of a network composed of road transport and haul roads especially for access to mineable areas and possibly for certain projects, bauxite transport;
- the joint operation of the ANAIM railway track or other tracks;
- the extraction of bauxite via open mines with a fingerprint that would cover a significant percentage of the land area of the region; and
- the construction or operation of alumina processing for certain projects.

17.5.11.2 Impact on demographics and social dynamics

Increase in social tensions

The simultaneous commissioning (or almost) of several bauxite extraction projects in the region could lead to two categories of migration across the Prefecture:

- job-seekers from other regions of Guinea and the sub-region, lured by job prospects in mining sector (qualified or unqualified workers, with or without their families); and
- farmers and cattle herders from the region, some of whom might be dispossessed of their land by the iron ore projects, seeking new arable and pasture land.

It is anticipated that migrants attracted by opportunities offered by the mining projects would tend to favor places that offer more prospects for hiring in the short-term. One can therefore expect regular movements of migrant populations progressively with each mining project in the Prefecture. These population movements could destabilize local social dynamics, with the arrival and departure of many job seekers who do not settle in a sustainable manner. This could favor going against rural traditional values and could therefore be the source of renewed social tensions in the mining areas.

We would also witness anarchic development of certain areas, especially close to the mining infrastructure of various concessions. Social tensions could be exacerbated, related to the pressure on basic infrastructure.

The magnitude of the impact is medium and its receptors sensitivity high. Its significance is therefore major.

To mitigate this impact, the various measures proposed are:

- raise awareness of the PDC on local and perennial recruitment issues; and
- support local authorities on the management of the budgets allocated to development so that they are oriented to the Income Generating Activities(IGA) and the development of health and education infrastructure.

The impact could remain high. These measures could only have a low mitigation impact identified due to its very high significance.

Economic pressure on women

In the rural area, men leave villages for cities looking for employment or to cultivate new land that would result in the majority of women, children and elderly people in some villages being heavily impacted, and a particularly strong economic pressure on women who would be in charge of the household.

The magnitude of this impact, across the Prefecture, could be medium and its receptors sensitivity high. Its significance would therefore be major.

In order to mitigate this impact, the Project may:

- support local authorities, in particular those concerned of the various mining concessions, so that development budgets allow the development of the Income Generating Activities (IGA) specifically the responsibility of women and more generally of the most vulnerable categories of the population; and
- support local authorities and raise awareness of the PDC to deliver seamless communication throughout the mining projects of the area and on their progress and their recruitment policy.

The significance of the residual impact is therefore medium.

17.5.11.3 Impact on powers, governance and civil society

Pressure on local authorities

The pressures on the prefectural and sub-prefectural authorities will be even greater as several mining projects start operating in the area (at different stages). People expect their authorities to claim their "rights" and defend their interests with the different companies. Expectations regarding the benefits of these projects for populations (especially in terms of employment and local development) would be even stronger and may undermine the authorities in place if these expectations are not met. The authorities could be accused of bad management of funds generated by projects or even corruption. An increase in political instability at the level of the decentralized bodies (representatives of the elected communes and districts or appointed by the people) would also be a potential impact. Finally, the economic development of the region would lead to a modernization of society.

The magnitude of this impact could be considered large and its receptors sensitivity high. Consequently, the significance of the impact is major.

To mitigate this impact, the various measures proposed are:

- to maintain an ongoing dialogue with local authorities and support them in their approaches with the management of the development and communication budgets;
- to familiarize traditional authorities with physical and economical re-introduction processes where appropriate; and
- to participate in the PDC, supporting it in its efforts of communication across the Prefecture.

The residual impact could be moderate.

Strengthening of civil society

Civil society organizations will benefit from the presence of numerous projects in the area, by offering their skills in the context of the implementation of development projects and actions of sensitization financed from own funds by mining companies or via the budgets of the FDL.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

In order to reinforce this positive impact, the Project will need:

- to maintain a regular dialogue with the representatives of civil society; and
- to encourage the participation of civil society in meetings of the PDC and development implemented by the authorities and mining companies.

The residual positive impact will be major.

17.5.11.4 Impact on the land

Land pressures making involuntary resettlement difficult

In terms of the Boké Prefecture, pressure on land may be strong, following the opening of the activities of several almost simultaneous bauxite projects. Involuntary physical displacements of populations might be numerous and the land available to accommodate these people less and less available. As a result, frustrations could grow within the physically or economically displaced population.

The magnitude of this impact, across the Boké Prefecture, could be large and its receptors sensitivity high.

The foreseeable measures for mitigating this impact are:

- to raise awareness, within the PDC, for all mining companies on relocation issues; and
- to strive to find relocation sites on the concession area in the GAC, in consultation with the authorities and communities concerned, in order to not move the populations on concessions of other companies.

The residual impact will remain major due to the very large number of projects in the area.

17.5.11.5 Impact on agriculture and cattle herding

Increased access degradation to croplands and grazing lands

The cumulative impacts of entry to construction sites and/or operations of several mining projects in the area would be negative and very high on key agriculture and livestock sectors, principle means of livelihoods of rural populations at the level of the mining concessions. Knowing that the majority of the populations practice burn agriculture and grazing in an extensive manner (small and large transhumances), communities need access to large areas of land to get satisfaction. The accumulation of projects may significantly degrade the conditions of access to these lands for communities. This phenomenon would result in a significant decrease in revenue for people living from agricultural and pastoral activities.

The magnitude of this impact is large and its receptors sensitivity high. Its significance is therefore major.

To mitigate this impact, it is possible to:

- to make sure to find viable solutions in terms of economic opportunities for resettlement on the mining concession; and
- to find an agreement with other mining companies to preserve some areas for grazing and transhumance paths across the Prefecture.

The residual impact will remain major due to the very large number of projects in the area.

Increased risk of food insecurity

Decrease in agricultural production would not only be associated with a decrease of products available for own household consumption, but also to inflation in the entire area of the prices of foodstuffs. This phenomenon will amplify if many projects start at the same time, insofar as overall production would be reduced and opportunities to circulate foodstuffs in order to restore a balance of supply and demand in the area would also be reduced. Food security of the poorest households would therefore be threatened.

The magnitude of this impact is large and its receptors sensitivity high. Its significance is therefore major.

To mitigate this impact, there should be discussion with local authorities and at the level of the PDC, to implement strategies throughout the area to limit the impoverishment of populations, including by implementing income generating activities on a wider scale than the single concession.

The significance of this residual impact could be moderate, as all the measures implemented that will limit the impoverishment of populations of the area.

17.5.11.6 Impacts on access conditions to natural resources

Removal of natural resources

Mining could affect the balance of watersheds by destroying many sources and polluting the waters of surfaces (dust/mud). The impact of this degradation of the quality and the quantity of water available in the area would not only have a significant impact on human health, sanitary conditions, but also on agriculture and livestock. Physical footprint of projects also plays on the availability of different environments, valued by local populations.

The magnitude of this impact is large in terms of the Prefecture and its receptors sensitivity is high. Its significance is therefore major.

To mitigate this impact, GAC will support the Sub-Prefecture and Prefecture of local authorities with the implementation and respect of a policy related to the preservation and rehabilitation of natural environments, and that would apply to all mining companies.

This impact could remain high.

Risk of revenue loss for communities

Impacts on gathering, hunting, fishing and collection of lumber and heating activities could also be significant. The possible simultaneous removal of the collection spaces by all mining projects that could be exacerbated by the

presence of migrant job researchers that would accelerate the rate of resource collection. The pressure on natural resources will therefore only increase and the income of people living on these samplings will decrease.

The magnitude of this impact is large and its receptors sensitivity high. Its significance is therefore major.

In order to mitigate this impact, it is possible:

- to preserve spaces on the concession during the finalization of the mining plan;
- to support the PDC to protect areas from exploitation, so that it is implemented, in each concession; and
- to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the area to limit the impoverishment of rural populations, including by implementing income generating activities on a wider scale than the single concession of the Project.

The residual impact could be of medium significance. The implementation of these measures may limit loss of income for a large number of people.

17.5.11.7 Impact on the local socioeconomic context

Increase in tax revenue of the Boké Prefecture and the municipalities

The industrial activities of the various projects will generate increases in budgets at the level of local de-concentrated and decentralized structures: collection of various taxes, matching funds for development by mining companies, etc. The State also collects taxes at the national level. In total, the mining sector in Guinea currently represents a quarter of State revenues. The presence of several simultaneous mining projects in the Prefecture give an increase of public budgets dedicated to the economic development of local authorities.

The magnitude of this impact is medium and its receptors sensitivity high. Its significance is therefore major.

To enhance this positive impact, it is necessary to support local and prefectural authorities in the definition of the strategies of allocating these funds and coordinate spending. This reflection may be initiated at the prefectural level via the PDC.

The residual impact of this impact will be high. The improvement measures will maximize the benefits associated with the increase in fiscal resources of local authorities.

Improvement of the living standards of persons recruited by the revitalization of the local economy and the mining sector

The mining sector is already the largest provider of jobs in the Boké Prefecture (direct and indirect jobs) and this proposal could grow significantly with the simultaneous operation of new projects. The number of households who would benefit from the positive economic impact of the development of the mining industry in the Prefecture would be all the more important, and these households could contribute back to the invigoration of the economy of the Prefecture thanks to their increased demand for various goods and services.

This stimulation of the economy must be balanced against negative impacts of the simultaneous start of bauxite mining projects impacting rural livelihoods).

The magnitude of this impact remains large and its receptors sensitivity high. Its significance is therefore considered major.

The foreseeable improvement measures are:

- to preserve useful resource spaces to communities on the concession and put in place a framework for consultation with other companies on the preservation of these areas at the level of the Prefecture via the PDC;
- to collaborate with other mining companies with the establishment of vocational training for the mining sector;
- to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the Prefecture to limit the impoverishment of rural households, including implementing income generating activities for women; and
- to support the authorities for management and direction of the funds dedicated to the development of the most disadvantaged households.

The residual impact will remain major. These measures will help to maximize the positive impact of recruitment by various mining projects, and to support households where no member will be recruited.

17.5.11.8 Impacts on health and safety

Improvement of health infrastructure

The increase in the contributions of mining companies (via the regulatory contributions and the initiatives using own funds) to the local development budgets of the Prefecture should allow for acceleration in development of basic infrastructure for health and sanitation in the area.

However, the migration of job seekers attracted to opportunities in the vicinity of the various projects in the Prefecture would result in parallel, into an increase of the pressure on these infrastructure (water, health, sanitation), that would temper the magnitude of this impact. In addition, the conditions of access to these facilities could be uneven with the possible impoverishment of some rural households deprived of part of their means of subsistence.

The magnitude of this impact is medium and its receptors sensitivity high. Its significance is therefore major.

The foreseeable improvement measures are:

- to support local authorities via the PDC in the redefinition of health care that takes account of mining projects and induced migration dynamics;
- to design new health infrastructure in anticipation of a population growth associated with the set of mining projects; and
- to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the Prefecture to limit the impoverishment of rural households.

The residual impact will remain major. These measures will maximize the benefits in terms of access to healthcare in the area.

Degradation of road safety throughout the Prefecture

All mining companies will have their own mining equipment and vehicles for transport of goods and persons who will run on the roads and tracks network of the Prefecture. Many are considering using ANAIM rails (increase of the frequency of passage of trains) or construct new railways. Road safety would therefore be degraded in the entire area.

The magnitude of the impact will be medium and its receptors sensitivity medium.

To mitigate this impact, it would be important to:

- to support the authorities for the strict implementation of road safety rules and applicable to all;
- to coordinate with other mining companies to secure the existing rails and the future tracks; and
- to support the authorities in their road and rail safety awareness campaign.

The magnitude of the residual impact will therefore be minor.

17.5.11.9 Impact on education

Improvement of education infrastructure

As in the health sector, the increase in the contributions of mining companies (via the regulatory contributions and the initiatives using own funds) to the local development budgets of the Prefecture should allow for significantly accelerating the development of basic infrastructure for education and the implementation of various training programs (literacy and vocational training) in the area.

However, the migration of job seekers and their families attracted to opportunities in the vicinity of the various projects in the Prefecture would result in parallel, into an increase of the pressure on the education infrastructure that would temper the magnitude of this impact. In addition, the conditions of access to these facilities could be uneven with the possible impoverishment of some rural households deprived of part of their means of subsistence.

The magnitude of this impact is medium and its receptors sensitivity medium. Its significance is therefore moderate.

The foreseeable improvement measures are:

- to support local authorities via the PDC in the redefinition of health care that takes account of specific need of mining projects (professional training) and induced migration dynamics;
- to design new infrastructure in anticipation of a population growth associated with the set of mining projects;
- to implement scholarship systems, especially for girls and the most impoverished households; and
- to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the Prefecture to limit the impoverishment of rural households.

The residual positive impact will be major. These measures will maximize the benefits in terms of better access to education in the area, and thus benefit a maximum number of people.

17.5.11.10 Impact on mobility, flows and transport

Risk of isolation of villages

Haul roads used only by mining companies and their subcontractors, as well as the physical presence of quarries or pits could significantly increase the risk of isolation of many communities who live near areas of operation.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

To limit the risk of isolation, the Project will need to liaise with the neighboring mining holding companies to coordinate the different plans and construction of tracks, particularly on the borders of the concessions.

The residual impact could be minor. These measures will in fact prevent the isolation of a maximum number of persons in the area.

17.5.11.11 Impact on the cultural heritage and archaeology

Loss of heritage sites on a large scale

The development of various mining projects could disrupt the CHe sites in many parts of the Prefecture. The most sensitive sites are cemeteries and the "sacred" so-called sites related to animist practices (sites of residence of geniuses). These impacts would have some cumulative repercussions on practices and could participate in the gradual erosion of the cultural, spiritual and religious heritage or cultural practices associated with it.

In terms of cumulative impacts, the main risk to cultural heritage is the potential for a substantial increase in population within the larger region as people from neighboring regions move into the area in search of work. Increased population is usually accompanied by the expansion of existing settlements or the establishment of new settlements. As settlements expand or are established, new areas will be subject to development, and it is likely that archaeological and living heritage sites would be impacted by this increased development. Population growth may also prompt the development of roads and other civil infrastructure with ground disturbing components, which would also likely impact archaeological sites.

Public outreach is the main tool that can be used to mitigate these cumulative impacts. Public outreach could be utilized to educate newly arriving populations about the region's important local heritage and why archaeological sites should be avoided when choosing new places to build or expand communities. Engagement with the local and national government could also be an effective mean to mitigate cumulative impacts, as these authorities would likely be in charge of civil infrastructure development, and engagement would increase their understanding of cultural heritage in the region.

The magnitude of this impact is large and its receptors sensitivity high. Its significance is therefore major.

In order to mitigate this impact, the Project would also support the local authorities so that they inform all the mining companies to the problems of displacement of these sites.

The significance of this residual impact is therefore medium. These measures will in fact help preserve many sites. Respect of the miners for the cultural heritage of local communities could also lead to a decrease in the sensitivity of populations.

17.5.11.12 Impacts on living conditions and the landscape

Degradation of the landscape on a large scale

Industrialization of the region would lead to a sharp deterioration of the quality of the landscape and the quality of life for a majority of the population. The majority of bauxite mines would operate in 'open pit' modes, which involves a

reconfiguration in the depth of landscapes and a degradation of the living environment, mainly in rural areas. This impact is expected to be particularly high in areas where two or several neighboring concessions would enter a construction phase and operating simultaneously.

The magnitude of this impact is medium and its receptors sensitivity medium. The significance of this impact is therefore moderate.

To mitigate this impact, the Project will discuss with the authorities across the Prefecture of a strategy for the preservation of landscapes to apply to all mining companies:

- to limit the height of the Project's future plants;
- to plan the rapid decommissioning of the temporary infrastructure required for the construction of the permanent infrastructure (cranes, etc.); and
- to provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed below and not at the residential areas).

The residual impact will remain moderate because of the large number of projects impacting the landscape at the same time.

Table 17.2 Mine area - summary of cumulative impacts on social component

Theme	*Impact*	Significance	Improvement / mitigation measures	*Residual significance*
Demography & social dynamics	*Increase in social tensions*	Major	- to raise awareness of the PDC on local and perennial recruitment issues. - to support local authorities on the management of the budgets allocated to development so that they are oriented to the Income Generating Activities (IGA) and the development of health and education infrastructure.	Major
	Economic pressure on women	Major	- to support local authorities, in particular those concerned of the various mining concessions, so that development budgets allow the development of the IGA specifically the responsibility of women and more generally of the most vulnerable categories of the population; and - to support local authorities and raise awareness of the PDC to deliver seamless communication throughout the mining projects of the area and on their progress and their recruitment policy.	Moderate
Power, governance & civil society	*Pressure on local authorities*	Major	- to maintain an ongoing dialogue with local authorities and support them in their approaches with the management of the development and communication budgets without imposing guidelines; - to associate traditional authorities with physical and economical re-installations processes where appropriate; and - to participate in the PDC, supporting it in its efforts of communication across the Prefecture.	Moderate
	Strengthening of civil society	Major	- to maintain a regular dialogue with the representatives of civil society. - to encourage the participation of civil society in meetings of the PDC and development implemented by the authorities and mining companies.	Major
Land tenure	*Land pressures making involuntary resettlement difficult*	Major	- to raise awareness, within the PDC, for all mining companies on relocation issues. - to strive to find relocation sites on the concession area in the GAC, in consultation with the authorities and communities concerned, in order to not move the populations on concessions of other companies.	Major
Agriculture & breeding	*Increased access degradation to croplands and grazing lands*	Major	- to make sure to find viable solutions in terms of economic opportunities for resettlement on the mining concession. - to find an agreement with other mining companies to preserve some areas for grazing and transhumance paths across the Prefecture.	Major
	Increased risk of food insecurity	Major	- to limit the impoverishment of populations, including implementing income generating activities on a wider scale than the concession only.	Moderate
Inequality of access to natural	*Removal of natural resources*	Major	- to support the Sub-Prefecture and Prefecture of local authorities for the implementation and respect of a policy related to the preservation and rehabilitation of natural	Major

Theme	*Impact*	Significance	Improvement / mitigation measures	*Residual significance*
resources	*at a large scale*		environments, and that would apply to all mining companies.	
	Risk of widespread revenue losses	Major	- to preserve spaces on the concession during the finalization of the mining plan. - to support the PDC, so that it is implemented, in each concession, of natural spaces protected from exploitation. - to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the area to limit the impoverishment of rural populations, including by implementing income generating activities on a wider scale than the single concession of the Project.	Moderate
Local socioeconomic context	*Increase in tax revenue of the Boké Prefecture and the municipalities*	Major	- to define strategies for managing these funds and coordinate spending. This reflection may be initiated at the prefectural level via the PDC.	Major
	Improvement of the living standards of persons recruited by the revitalization of the local economy and the mining sector	Major	- to preserve useful resource spaces to communities on the concession and put in place a framework for consultation with other companies on the preservation of these areas at the level of the Prefecture via the PDC. - to collaborate with other mining companies with the establishment of a functional training vocational offering in relation to the mining sector so that employment in the sector results in the largest number. - to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the Prefecture to limit the impoverishment of rural households, including by implementing income generating activities for women. - to support the authorities for management and direction of the funds dedicated to the development of the most disadvantaged households.	Major
Health and safety	*Improvement of health infrastructure*	Major	- to support local authorities via the PDC in the redefinition of health care that takes account of mining projects and induced migration dynamics. - to design new health infrastructure in anticipation of a population growth associated with the set of mining projects. - to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the Prefecture to limit the impoverishment of rural households.	Major
	Degradation of road safety throughout the Prefecture	Moderate	- to support the authorities for the strict implementation of road safety rules and applicable to all. - to coordinate with other mining companies to secure the existing rails and the future tracks.	Minor

Theme	*Impact*	Significance	Improvement / mitigation measures	*Residual significance*
			- to support the authorities in their road and rail safety awareness campaign.	
Education	*Improvement of education infrastructure*	Moderate	- to support local authorities via the PDC in the redefinition of health care that takes account of specific need of mining projects (professional training) and induced migration dynamics. - to design new infrastructure in anticipation of a population growth associated with the set of mining projects. - to implement scholarship systems, especially for girls and the most impoverished households. - to discuss with local authorities and at the level of the PDC, strategies to be implemented throughout the Prefecture to limit the impoverishment of rural households.	Major
Mobility, flows & transport	*Risk of isolation of villages*	Moderate	- to liaise with the neighboring mining holding companies to coordinate the different plans and construction of tracks, particularly close to the boundaries of concessions.	*Minor*
Cultural heritage	*Loss of heritage sites on a large scale*	Major	- to support the local authorities so that they inform all the mining companies to the problems of displacement of these sites.	Moderate
Landscape & living environment	*Degradation of the landscape on a large scale*	Moderate	- to limit the height of the Project's future plants. - to plan the rapid decommissioning of the temporary infrastructure required for the construction of the permanent infrastructure (cranes, etc.). - to provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed below and not at the residential areas).	Moderate

17.6 PORT-MARINE TERMINAL

17.6.1 Introduction

This chapter presents the assessment of cumulative impacts that would result from the combination of the Project and other actual or proposed future developments around the port terminal Project Area.

The existing or future developments considered in the analysis include facilities located at the port marine terminal but also potential developments located far from the port terminal but which are expected to pass by the port terminal for transportation or shipment purposes, such as:

- COBAD Dian Dian project: this will develop a port facility near Taress which is located upstream on the Rio Nuñez approximately 10 km upstream of the GAC trestle. The project will load barges which will be towed downstream to deeper water where a transshipment operation will transfer ore onto carriers;

- Koumbia project: it will develop a river port located near Bogoraya which is approximately 90 km upstream on the Rio Nuñez. Vessels will transport bauxite to a transshipment site located in suitable water depth for Cape size vessels in coastal waters 32 km offshore of Kamsar; and

- Kabata – Alcoa/Rio Tinto Alcan: it targets the construction of a refinery in Kolaboui (Alcoa-Alcan of Guinea) in the Boké Prefecture potentially requiring port facilities at Kamsar. The partners in this Project are Alcoa and Rio Tinto/Alcan. The planned initial production is 1.5 MPTA for alumina with the possibility of an extension to 4.5 MPTA from non-exportable bauxite that will be produced by CBG. This Project would be linked to the current the ANAIM railway. A feasibility study was carried out in 2009 and initial state studies in 2012. According to the Alcoa website (http://www.alcoa.com, accessed July 2015), feasibility studies still are ongoing and no further information is available to allow potential cumulative impacts with the GAC Project to be assessed.

17.6.2 Cumulative impact assessment on air quality

17.6.2.1 Introduction

The main sources of atmospheric emissions at the port terminal Project area are the existing and operative CBG facilities and associated activities (including road and train) traffic, located in the Kamsar area, 800 m west of GAC facilities.

No cumulative impacts are expected to result from the combination of GAC and the future COBAD port facilities; the latter will be located in the Northern Guinean coast (Dobali area), thus will not affect the Kamsar area.

CBG facilities primarily emit the following pollutants:

- dust from material handling and processing (processing plant) and wind blow from exposed surfaces; and

- exhaust emissions from power generators.

No detailed data on CBG emissions are available.

The AQ baseline measurements performed at the Kamsar port terminal captured the contribution of CBG and measured atmospheric concentrations of NOx and SO_2 along with dust deposition. Baseline data highlighted concentrations below in force air quality standards for NOx and SO_2, and high dust deposition level.

Due to the absence of detailed data for the actual emissions of CBG facilities at Kamsar area, the assessment of cumulative impact was primarily based on the outcome of the atmospheric dispersion modeling study performed for GAC. This modeling study took into account the outcome of the air quality baseline and considered the Kamsar airshed as undegraded for NOx and SO_2, and as degraded for dust concentrations.

Similarly to the assessment performed for the mine Project area, the assessment of cumulative impacts for the port terminal was structured as follows:

- identification of the areas/receptors most likely to undergo cumulative impacts; and

- evaluation of the magnitude of predicted impacts at receptors located in the areas most likely to undergo cumulative impacts.

Cumulative impacts will most likely occur and be critical for long-term concentrations (e.g. annual averages). Short-term concentrations (e.g. hourly/daily concentrations) are subject to a high variability during the year being dependent on specific micro meteorology. Therefore the qualitative assessment of cumulative impacts in the short-term is highly unpredictable and the assessment presented in this section only refers to long-term concentrations.

17.6.2.2 Spatial analysis of cumulative impacts on air quality

The atmospheric dispersion modeling activities performed for GAC port facilities highlighted that long-term impacts are mostly confined within the GAC port terminal boundary.

The highest concentrations predicted outside GAC port terminal are located east of the port terminal boundary, in accordance with the predominant wind direction coming from west-south west. The main receptors in the area are represented by the Kamsar urban area, located north and east of GAC port terminal. The receptors located to the east of the GAC onshore port terminal are the most likely to undergo cumulative impacts.

17.6.2.3 Assessment of cumulative impacts on air quality

The atmospheric dispersion modeling activities performed for GAC port terminal quantified the ground level concentration of pollutants (NOx, SO_2 and PM_{10}) induced by GAC.

The impact assessment methodology was based on IFC general EHS Guideline for air emissions and ambient air quality and is different for degraded or undegraded environments. In undegraded airshed if the project contribution is less than 25 percent of the applicable air quality standards induced impacts will be classified as negligible; in degraded airsheds if the project contribution is less than 10 percent of the applicable air quality standards impacts will be classified as negligible. In general at receptors where predicted impacts are negligible future development is allowed and significant cumulative impacts can be reliably excluded.

Therefore, the assessment of cumulative impacts evaluated whether the contribution of GAC at receptors is negligible or not.

GAC's impact assessment at the port terminal took into account the outcome of the air quality baseline and considered the Kamsar airshed as undegraded for NOx and SO_2, and as degraded for dust concentrations.

Predicted concentrations of NOx and SO_2 in the long-term lead to negligible impacts, therefore no significant cumulative impacts are expected for these pollutants. Moreover baseline levels of NOx and SO_2 are low.

Predicted concentration of PM_{10} in the long-term leads to moderate impacts, localized inside the port terminal and on the area located east of the terminal boundary, where no specific receptors where identified. Cumulative impacts are likely to arise in this area, located downwind to the port terminal. The Kamsar urban area located to the west of the port terminal might undergo significant negative cumulative impacts.

PM_{10} annual concentrations predicted in the northern part of the Kamsar urban area are below 10% of the applicable air quality standard, and lead to negligible impacts. Therefore, cumulative impacts in this urban area located north of GAC's port terminal are less likely to occur. However, they cannot be excluded due to the geographical proximity of the GAC and CBG terminals and to the possibility of future developments.

17.6.3 Cumulative impacts on noise and vibrations

GAC's port terminal is located in the Kamsar area, where the existing acoustic climate is already affected by industrial sources currently operated by CBG, located about 800 m west of the future GAC port terminal.

The future developments such as Dian Dian (COBAD) and Alcan-Alcoa port facilities will be located sufficiently far from GAC port terminal in order not to result in cumulative noise impacts.

Therefore, significant cumulative impacts are expected to occur in the Kamsar area from the activities to be conducted by GAC and CBG facilities, both concerning the ore processing and the railway transportation.

Vibration effects attenuates very quickly over distance, therefore considering the distances between CBG and GAC facilities operating in the area, vibration cumulative impacts are not expected to occur.

The contribution of the existing CBG bauxite port facilities to the acoustic climate has been monitored during the field survey performed in 2015 at the Kamsar area. Monitored data highlighted exceedances of the IFC noise criteria in the residential area of Kamsar, as a direct consequence of both railway traffic and plant operations.

The baseline monitoring data were compared to the outcomes of the modeling studies performed to assess GAC Project contribution. The noise assessment has been performed distinguishing between two scenarios for the railway operations:

- Step 1: assessment of the railway traffic noise considering only the contribution of GAC operations.

- Step 2: assessment of the railway traffic noise considering GAC operations and likely future developments of the railway.

The noise assessment performed for Step 1 showed that noise emissions generated by GAC, both related to railway operations and operations of facilities at the port terminal, will result in a significant increase of the existing noise background levels (mainly affected by CBG project). Thus, significant cumulative impacts are expected to occur from the interaction between GAC and CBG operations.

Also, the noise assessment performed for Step 2 showed that noise emissions generated by GAC and other future developments will increase the existing background levels and will result in moderate cumulative impacts.

Finally, the contribution of other future Project developments to the rail traffic will extend the noise impact footprint to higher distances from the railway, potentially affecting further receptors.

17.6.4 Cumulative impact assessment on terrestrial flora and vegetation

The marine and port terminal sections of the GAC project are embedded within a mosaic of different land cover types, such as mangrove forests, agricultural areas (e.g. rice paddies), and human settlements, both residential and industrial. The most relevant habitat is the Guinean mangrove ecosystem.

Mangrove areas in Guinea have significantly declined since the eighties, mainly due to the construction of coastal infrastructures related to bauxite mine

developments, as well as to other factors of land clearance and disturbance such as agriculture and aquaculture, and population growth.

In terms of mining infrastructure, the existing CBG facility was constructed in the early seventies, and persists until today, while the future GAC port/terminal area was cleared in 2005 under a separate permit/study. Both projects are located within the Kamsar area. Future developments such as Dian Dian (COBAD) and Alcan-Alcoa port facilities will require further clearing of mangrove areas, with the COBAD port facilities being located towards the northern Guinean coast. These areas will endure throughout the whole Project life (as opposed to mine areas that can be subsequently restored); and as such will represent a semi-permanent loss of Mangrove cover. The impact of loss of mangrove habitat area is thus assessed as moderate.

Impacts from disturbance as well as species loss are considered to be most relevant in terms of indirect effects of the project rather than those related to the direct project footprint such as population influx and unsustainable resource uses; which have been identified as the main drivers of change in Guinean mangrove ecosystem. These impacts are assessed as moderate.

17.6.5 Cumulative impact on surface water

Potential cumulative water quality impacts may arise relating to requirements for outfall / crossing construction and associated mangrove clearance, if required. However, any additional clearance will be conducted in accordance with Guinean permitting procedures and GAC environmental controls, which will seek to minimize the potential for impacts relating directly, or cumulatively, to the Project.

As the development platform is already in place, the potential for cumulative effects to the water environment will be minimized. Detailed procedures pertaining to additional required surface drainage, bunding, segregation and treatment will be developed during the detailed design phases of the Project. Such measures will be progressed utilizing the results of particle size distribution and geochemical testing to ensure that detrimental impacts to water quality do not result. Potential impacts upon flow or runoff relating to Project activities and the introduction of hardstanding, abstractions and discharges are not anticipated due to the inter-tidal nature of the environment. No other receptors are located in the immediate hydrological vicinity. The mitigation measures described within the surface water impact assessment sections for the GAC Project will seek to ensure that any residual or unforeseen cumulative effects due to Project activities are managed appropriately.

17.6.6 Cumulative impact on groundwater

Groundwater will not be abstracted for the purpose of supporting the port operations but will rather be supplied from reverse osmosis (RO) desalination plant abstracting brackish estuarine water. Mitigation measures will be put in place to promote appropriate levels of recharge of precipitation which is

diverted due to the creation of areas of hardstanding. Hence groundwater quantity is unlikely to be subject to cumulative effects.

Groundwater quality will be maintained through the mitigation measures defined within the surface water and groundwater impact assessment presented within this SEIA, including the requirement to revisit drainage segregation, bunding and treatment following the analysis and quantification of metal leaching and ARD potential. These provisions will reduce the likelihood of cumulative effects on groundwater quality relating to Project activities.

17.6.7 Cumulative impact on the marine environment

17.6.7.1 Introduction

As outlined in the marine physicochemical and marine biological environment impact assessment chapters, the marine aspects of the GAC project are being developed in the context of the wider operations of the existing Kamsar Port. These include the main Kamsar port facilities at the container terminal/ French Quay, various smaller fishing jetties north of this and the CBG export jetty which lies just north of the planned GAC trestle in the Rio Nuñez channel.

These exiting facilities and associated operations, including foreseeable future operations have been considered within the baseline and impact assessment for the new GAC trestle, dredge and operations. The project has been designed to minimize additional impacts wherever possible, for example by sharing and building upon the existing navigation channel footprint where possible.

The marine cumulative impact assessment covers other known planned activities/ projects that may interact with GAC Project in addition to the existing facilities and ongoing operational already considered in the marine impact assessment.

17.6.7.2 Scoping

The Valued Environmental and social Components (VECs) of the marine environment were identified in the marine baseline. Based on the findings of the marine impact assessment and the potentially significant project impacts, the following VECs are considered in the cumulative assessment:

- marine water column, seabed and intertidal environment;
- mangroves (the cumulative impact on mangrove is considered in port terrestrial flora and fauna cumulative assessment): and
- marine fauna including fish, marine turtle and mammals.

The time frame to be considered includes development phase activities, construction (e.g. piling), and capital dredging which may be short-term. It also considers activities which may occur throughout the operational life of the project, or be episodic, for example maintenance dredging. The geographic scope of analysis is based on the area of influence derived for different activities and receptors in the marine impact assessment.

17.6.7.3 Scoping: other activities to be considered

The details of two projects which are planned and may affect the marine environment within the area of influence are currently available, namely COBAD Dian Dian and Koumbia projects. Neither of these two has been constructed yet and therefore they have not been considered in the marine baseline and impact assessment.

For what concerns the COBAD Dian Dian project, no dredging or other marine construction works are envisaged to interact with the GAC Project. Operational interactions are considered to be limited to those relating to vessel movements and associated transshipment activities.

The Koumbia project will involve the development of a small loading facility in the Rio Nuñez channel but as this is over 10 km from the GAC site no significant interaction with the GAC Project is envisaged. Based on this project's SEIA, no significant dredging is anticipated to be associated with the project. As a result, the only potentially significant activities of the Dian Dian project which may interact with GAC are vessel movements and associated transshipment activities.

The cumulative impact assessment considers these two projects and their interactions with the GAC project.

17.6.7.4 Establish Baseline status of VECs

The sensitive, vulnerable or important marine receptors were identified in the marine baseline and impact assessment *Chapters 7 and 9*.

17.6.7.5 Assessment of significance of cumulative impacts on VECs

The two above-mentioned third party projects may interact with GAC and its effects on the marine environment. The potential cumulative interactions in both cases are limited to vessel operations and transshipment from both projects.

The GAC marine impact assessment identified potential impacts associated with vessel operations as including the following:

- disturbance to the marine environment and generation of underwater noise;
- potential for erosion of banks and bed as a result or propeller scour and vessel wake.
- vessel strike on marine fauna, including turtles and mammals.
- pollution of the environment from discharges from vessels.
- potential for the spillage of diesel during routing fuel delivery at the GAC terminal or a low likelihood major spillage resulting from a vessel fuel tank and tanker spill.
- potential for invasive species issues relating to vessel operations and ballast water.

The impact assessments for these two projects did not predict moderate or major significance impacts relating to vessel operations.

GAC's marine impact assessment predicted residual impacts associated with vessel operations as predominantly negligible. A minor significance residual impact from vessel strike to marine turtle and for vessel noise impacts on high sensitivity fish species was anticipated. In addition, the residual impact for invasive species was predicted to be moderate significance as whilst low likelihood, the consequences could be major.

Vessel movements associated with GAC Project will have a cumulative effect with vessel movements and transshipment from the other two projects identified. They will increase the overall volume of shipping in coastal waters and in the Rio Nuñez and the number of vessel passages. These impacts will take place within the context of the pre-exiting operational port of Kamsar. The overall density of shipping in the wider area will remain low given the size of the area considered. Some higher density areas of activity and disturbance will exist, for example in anchoring or transshipment areas and in the navigational channel.

Considering the above factors, the potential cumulative impacts related to vessel movements are predicted to be:

- low significance for vessel strike to turtles;
- low significance for disturbance to fish due to underwater noise; and
- moderate significance for invasive species issues in the low likelihood circumstances that they occur.

17.6.7.6 Management of cumulative impacts

GAC shall work closely with the port authority who will have ultimate responsibility for management of vessel operations and with other operators to minimize cumulative impacts wherever feasible.

17.6.8 Cumulative impact on social component

17.6.8.1 Sources of impact

The principal sources of impact shall be:

- the construction and operation of new industrial units (crushing and processing of ore);
- the construction of new port terminals;
- an increase of the surfaces and volumes dredged; and
- an increase in maritime traffic.

17.6.8.2 Impact on demographics and social dynamics

Increase in risk of social tensions

The construction of processing plants and port facilities for projects in the Kamsar area would result in significant migration flows to the area, mainly two types:

- agricultural workers from surrounding rural areas, looking for employment in the urban areas; and
- job searchers coming from other regions of Guinea and from the sub-region.

This rapid migratory influx would lead to a rapid and large population growth of urban and peri-urban areas, with particularly elevated concentrations in Kamsar and its surroundings. This influx of foreigners in the metropolitan area could accelerate the disorganized urbanization of the outlying districts of the city. Social tensions could be exacerbated, related to the pressure on basic infrastructure and the idleness of the unemployed.

The magnitude of the impact is medium and its receptors sensitivity high. Its significance is therefore major.

To mitigate this impact, the various measures proposed are:

- to raise awareness of the PDC on local and perennial recruitment issues; and
- to support local authorities on the management of the budgets allocated to development so that they are oriented to the Income Generating Activities (IGA) and the development of urbanization plans (subdivision of land, infrastructure development etc.).

The impact could remain high reflecting the difficulty in managing such an impact.

17.6.8.3 Impact on powers, governance and civil society

Pressure increase on local authorities

The impacts of different mining projects on power, governance and civil society in the Kamsar SP would remain medium, where local authorities are evolving for several decades in the context of a neighborhood with multinational mining (project CBG). However, issues regarding the anticipated benefits of the various projects in terms of creating jobs and improving basic services could influence the authorities. They may have to manage strong social tensions that are crystallizing for some years around the conditions of access to basic services (water, electricity) and suffer a credibility gap. Claims and tensions could also develop in the villages south of the city of Kamsar who would be impacted by the various projects.

The magnitude of this impact is considered medium and its receptors sensitivity high. Its significance is therefore major.

To mitigate this impact, the various measures proposed are:

- to maintain an ongoing dialogue with local authorities and support them in their approaches with the management of the development (contribution from different mining operations) and communication budgets without imposing guidelines; and
- to participate in the PDC, supporting it in its efforts of communication across the Prefecture.

The residual impact will remain major reflecting the difficulty in managing such an impact and the sensitivity of the receiving environment with the impact.

Strengthening of the civil society across the metropolitan area

The city of Kamsar hosts many associations and NGOs that can quickly be mobilized around development projects, mediation, and awareness or information transmission.

Civil society organizations could appropriately take advantage of the simultaneous presence of several mining projects to develop their activities and become more professional. They could be mobilized for campaigns of awareness and development with communities impacted funded jointly by the different mining operators in the area.

The magnitude of this impact is low and its receptors sensitivity high. Its significance is therefore moderate.

In order to reinforce this impact, the Project will need:

- to maintain a regular dialogue with the representatives of civil society.
- to encourage other mine operators to pool certain budgets devoted to initiatives for community development, the awareness on transversal issues (road safety, preservation of the environment, hygiene and sanitation); and
- to encourage the participation of civil society in meetings of the PDC and development.

The residual positive impact will be major. In fact, these measures will help stimulate the development of a dynamic and sustainable civil society.

17.6.8.4 Impact on the land

Risk of involuntary resettlement

The main impacts on the land should be felt in urban areas of Kamsar during the construction phase of other projects. The construction of infrastructure (port, railway, housing for workers, etc.) could lead to a significant number of physical and/or economic displacements resulting in a risk of increasing tensions with local authorities, loss of economic opportunities related to the

development of resource spaces (mangrove rice in the Kamsar area) and a risk of isolation of certain communities in terms of their access to basic infrastructure (health centers schools, water points, marketing areas).

The magnitude of the impact will be low and its receptors sensitivity high. Its significance is therefore moderate.

In order to mitigate this impact, possible measures would be to support the authorities in their planning of increasing urbanization of the city, in consultation with other mining companies.

The residual impact will remain moderate. In fact, despite optimal management of resettlements, the risk of involuntary resettlement will remain a very sensitive issue.

Land and housing price inflation

Continuing arrivals of migrants seeking work on mining projects would also induce a significant increase in the price of land resources (speculative effect), as well as inflation prices of rental housing.

The magnitude of this impact will be medium and its receptors sensitivity medium. Its significance is therefore moderate.

To mitigate this impact, the various measures proposed are:

- to develop, with other mining companies, and local authorities, support for a communication strategy on their activities and in particular on recruitment to limit migratory influxes; and
- to support the authorities in their planning of increasing urbanization (housing estates, development of infrastructure on the outskirts of the city, etc.).

The residual impact will remain moderate. The risk of inflation will indeed remain a medium-scale sensitive subject.

17.6.8.5 Impact on agriculture and cattle herding

Degradation of rice of Mangrove rice paddies

The multiplication of port terminals could increase the right-of-way on the mangrove and rice paddies along the estuary of the Rio Nuñez, causing economic losses for farmers in the area (*see Environmental impact assessment*).

The magnitude of the impact will be low and its receptors sensitivity high. Its significance would therefore be moderate.

In order to mitigate this impact, the Project can work with mining companies that settle in the zone with the pooling of port infrastructure.

The residual impact will therefore be minor. Agriculture and livestock will be impacted to a lesser magnitude with the implementation of these measures.

17.6.8.6 Impacts on access conditions to natural resources

Deterioration of access to natural resources

The construction of infrastructure, the increase of dredging activities in the estuary of the Rio Nuñez, and the growing movement of the number of ore vessels would cause disruption of ecosystems and would bring increased pressure on fishery resources in the area of the estuary. This would have an impact on the economy of the fishing sector (including processing and marketing) in the Kamsar area. Artisanal fishermen and women involved in fish-smoking constitute a particularly vulnerable social group.

The magnitude of this impact could be considered medium and its receptors sensitivity high. Its significance is therefore major.

In order to mitigate this impact, GAC will support the authorities and coordinate with other mining companies so that the local development funds are partly oriented to support alternative IGA for those involved in the fishing industry.

The residual impact will be of medium significance. Fishermen would benefit from alternative economic resources.

17.6.8.7 Impacts on the local socioeconomic context

Local economic impetus

The arrival of several projects in Kamsar would create significant direct and indirect employment. The trade and services sector would be boosted with the increase in demand and the increase in the purchasing power of a portion of the population (employees of mining companies). Numerous arrivals could, when they cannot find employment in mining companies or their subcontractors, integrate in the informal economy of the "small jobs" in the trade and services sector.

The magnitude of the impact will be medium and its receptors sensitivity high. The significance of the impact is therefore major.

In order to strengthen this impact, the Project could, in consultation with other mining companies, support the development of local entrepreneurship (policy preference to suppliers and premises for goods and services, skills-building programs and financial support and / or technical stakeholders in non-mining sectors).

The residual positive impact will be major. These measures will help to maximize the positive impact of the various projects in terms of economic dynamism.

17.6.8.8 Impacts on health and safety

Improvement of health infrastructure

As in the mining sector, the increase in the contributions of mining companies (via the regulatory contributions and the initiatives using own funds) to the local development budgets of the municipality should allow for significantly accelerating the development of basic infrastructure for health and sanitation in Kamsar and in the surrounding areas.

The migration of job seekers attracted to job opportunities would cause an increase in the pressure on drinking water and would contribute to increased waste and reduced safety for the city of Kamsar. Deterioration in health conditions may be at the origin of the expansion of certain pathologies, as was the case with cholera in 2014. Conversely, the increase in demand could also encourage the emergence of new private care structures.

The magnitude of this impact is medium and its receptors sensitivity high. Its significance is therefore major.

The foreseeable improvement measures are:

- to design new health infrastructure in anticipation of a population growth associated with the set of mining projects;
- to support, in consultation with other mining companies, local authorities to improve the quality and accessibility of drinking water points;
- to support, in consultation with other mining companies, local authorities for the implementation of an effective waste management system; and
- to organize common hygiene awareness campaigns.

The residual impact will remain major. These measures will allow maximizing access to better sanitary conditions and hygiene for a large part of the population.

Increase in road and maritime insecurity

In the area of the estuary, key risks concern the cohabitation between ore traffic (in the channel) and small fishermen with non-motorized craft who are easily driven by currents. The risk of accidents in the waterway could increase, even if there are no incidents involving an ore ship and a local boat reported so far.

The presence of several industrial projects would also induce an increase of the number of vehicles circulating in Kamsar and could impact road safety.

The magnitude of this impact is medium and its receptors sensitivity medium. The impact therefore has a moderate significance. .

In order to mitigate this risk, it is possible to:

- to support the development, in partnership with other mining companies, of an estuary fishing awareness campaign;
- to coordinate with other mining companies to develop road safety awareness campaigns and adopt a code of road traffic (speed limits, signs, etc.) unique to the area and for all operators involved;
- to support, in partnership with the other mining companies, the development of transport infrastructure (overhaul of the road network, putting in place of a performing collective transport system, etc.);
- to support the authorities, in partnership with other mining companies, for the establishment of strict rules for navigation in the estuary; and
- to provide regular training on safety to operators of ore vessels.

The residual impact could be minor. These measures will help streamline and secure road and maritime traffic by anticipating risks.

17.6.8.9 Impact on education

Improvement of education infrastructure

As in the health sector, the increase in the contributions of mining companies (via the regulatory contributions and the initiatives using own funds) to the local development budgets of the Prefecture should allow for significantly accelerating the development of basic infrastructure for education and the implementation of various training programs (literacy and vocational training) in the Kamsar SP.

However, the migration of job seekers and their families attracted to opportunities in the vicinity of the various projects would result in parallel, into an increase of the pressure on these education services that would temper the magnitude of this impact.

The magnitude of this impact is medium and its receptors sensitivity medium. Its significance is therefore moderate.

The foreseeable improvement measures are:

- to support local authorities in the redefinition of a health card that takes account of specific need of mining projects (professional training) and induced migration dynamics; and
- to design new infrastructure in anticipation of a population growth associated with the set of mining projects.

The residual impact will be major. These measures will maximize the education offer and ensure its sustainability.

17.6.8.10 Impact on mobility, flows and transport

Increase in demand and the supply of transport

The expansion of the population of Kamsar and its districts should coincide with a general increase in traffic needs at the regional level. The increase in the population could also lead to the development of the offer, with the appearance of new transport companies. The increase of supply and demand could boost this sector in the area, but also contribute to congestion in the metropolitan area.

The magnitude of the impact will be medium and its receptors sensitivity medium. Its significance is therefore moderate.

To reinforce this impact, the various measures proposed are:

- to support local authorities, in consultation with other mining companies, to develop the provision of public transport and improve the planning of road traffic in the area; and
- to educate employees and the local population to respect the highway code.

The residual impact will remain moderate. These measures will streamline the traffic and anticipate the risks associated with it.

17.6.8.11 Impacts on cultural heritage

Risk of damage to the cultural heritage of the mangrove areas

The multiplication of mining stakeholders may increase the physical influence of industrial infrastructure in the coastal area of the Boké Prefecture. The consequences on cultural heritage could be locally important when construction begins, especially if the mining companies do not have a protocol for the identification and localization of sites, and prevention and management of impacts on any sacred sites, places of worship and cemeteries that might be affected. In fact, in mangrove areas of sacred sites such as residences of genies may be present in large numbers.

The magnitude of this impact could be considered medium and its receptors sensitivity high. Its significance is therefore major.

In order to mitigate this impact, the Project could raise awareness of other mining companies, particularly in the context of the PDC meeting, taking account of cultural heritage during the preliminary work on the construction of facilities (inventory of sites, sites process, taken into account of cultural heritages in the implementation of travel and relocation programs).

The residual impact could be moderate. These measures will in fact ensure better management of the cultural heritage by all mining projects and, from there, preserve and respect a maximum number of sites.

17.6.8.12 Impacts on living conditions and the landscape

Landscape degradation

The quality of life of the resident populations would be potentially highly impacted by the establishment of several companies in the Kamsar area. The further industrialization of the area would result in a degradation of the landscape and an increase in pollution (including noise, dust, etc.).

The magnitude of the impact will be medium and its receptors sensitivity medium. Its significance would therefore be moderate.

To mitigate this impact, the Project will be able to discuss with the authorities across the Prefecture of a policy for the preservation of landscapes to apply to all mining companies:

- to limit the height of the future industrial plants;
- to plan the rapid decommissioning of the temporary infrastructure required for the construction of the permanent infrastructure (cranes, etc.); and
- to provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed below and not at the residential areas).

The residual impact will remain moderate. Despite these measures, the landscape will remain impacted at a medium level because of the large number of mining projects.

Table 17.3 Port area - summary of cumulative impacts

Theme	*Impact*	Significance	Improvement / mitigation measures	*Residual significance*
Demography & social dynamics	*Increase in risk of social tensions*	Major	- to raise awareness of the PDC on local and perennial recruitment issues. - to support local authorities on the management of the budgets allocated to development so that they are oriented to the IGA and the development of urbanization plans (subdivision of land, infrastructure development etc.).	Major
Power, governance & civil society	*Pressure increase on local authorities*	Major	- to maintain an ongoing dialogue with local authorities and support them in their approaches with the management of the development (contribution from different mining operations) and communication budgets without imposing guidelines. - to participate in the PDC, supporting it in its efforts of communication across the Prefecture.	Major
	Strengthening of the civil society across the metropolitan area	*Moderate*	- to maintain a regular dialogue with the representatives of civil society. - to encourage other mine operators to pool certain budgets devoted to initiatives for community development, the awareness on transversal issues (road safety, preservation of the environment, hygiene and sanitation). - to encourage the participation of civil society in meetings of the PDC and development.	Major
Land tenure	*Risk of involuntary resettlement*	*Moderate*	- to support the authorities in their planning of increasing urbanization of the city, in consultation with other mining companies.	*Moderate*
	Land and housing price inflation	*Moderate*	- to develop, with other mining companies, and local authorities, support for a communication strategy on their activities and in particular on recruitment to limit migratory influxes. - to support the authorities in their planning of increasing urbanization (housing estates, development of infrastructure on the outskirts of the city, etc.).	*Moderate*
Agriculture & breeding	*Degradation of rice of Mangrove rice cultivation*	*Moderate*	- to work with mining companies that settle in the zone with the pooling of port infrastructure.	*Minor*
Inequality of access to natural resources	*Deterioration of access to natural resources*	Major	- to support the authorities and coordinate with other mining companies so that the local development funds are partly oriented to support alternative IGA for those involved in the fishing industry.	*Moderate*
Local socioeconomic context	*Local economic impetus*	Major	- to support, in consultation with other mining companies, the development of local entrepreneurship (policy preference to suppliers and premises for goods and services, skills-building programs and financial support and / or technical stakeholders in non-mining sectors).	Major
Health and safety	*Improvement of health infrastructure*	Major	- to design new health infrastructure in anticipation of a population growth associated with the set of mining projects.	Major

Theme	*Impact*	Significance	Improvement / mitigation measures	*Residual significance*
			- to support, in consultation with other mining companies, local authorities to improve the quality and accessibility of drinking water points.	
			- to support, in consultation with other mining companies, local authorities for the implementation of an effective waste management system.	
			- to organize common hygiene awareness campaigns.	
	Increase in road and maritime insecurity	*Moderate*	- to support the development, in partnership with other mining companies, of an estuary fishing awareness campaign.	*Minor*
			- to coordinate with other mining companies to develop road safety awareness campaigns and adopt a code of road traffic (speed limits, signs, etc.) unique to the area and for all operators involved.	
			- to support, in partnership with the other mining companies, the development of transport infrastructure (overhaul of the road network, putting in place of a performing collective transport system, etc.).	
			- to support the authorities, in partnership with other mining companies, for the establishment of strict rules for navigation in the estuary.	
			- to provide regular training on safety to operators of ore vessels.	
Education	*Improvement of education infrastructure*	*Moderate*	- to support local authorities in the redefinition of a health card that takes account of specific need of mining projects (professional training) and induced migration dynamics.	Major
			- to design new infrastructure in anticipation of a population growth associated with the set of mining projects.	
Mobility, flows & transport	*Increase in demand and the supply of transport*	*Moderate*	- to support local authorities, in consultation with other mining companies, to develop the provision of public transport and improve the planning of road traffic in the area.	*Moderate*
			- to educate employees and the local population to respect the highway code.	
Cultural heritage	*Risk of damage to the cultural heritage of the mangrove areas*	Major	- to raise awareness of other mining companies, particularly in the context of the PDC meeting, taking account of cultural heritage during the preliminary work on the construction of facilities (inventory of sites, sites process, taken into account of cultural heritages in the implementation of travel and relocation programs).	*Moderate*
Landscape & living environment	*Landscape degradation*	*Moderate*	- to limit the height of the future industrial plants.	*Moderate*
			- to plan the rapid decommissioning of the temporary infrastructure required for the construction of the permanent infrastructure (cranes, etc.).	
			- to provide for external night-time discreet lighting, pointing at the process facility and other mining infrastructure and the works areas (light beams aimed below and not at the residential areas).	