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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE CONSTRUCTION AND OPERATION OF A FLOUR MILL PROJECT AT THE SEA PORT ZONE OF DOUALA, DOUALA I SUB-DIVISION, WOURI DIVISION, LITTORAL REGION DOUALA - CAMEROON-DOUALA



December 2021



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LIST OF ABBREVIATIONS

AES	Environmental and social aspect
BET	Consultancy Firm
CAMTEL	Cameroon Telecommunication
CEMAC	Economic and Monetary Community of Central Africa
ESIA	Environmental and Social Impact Assessment
EIES	Environmental and social impact study
STI	Sexually transmitted infection
NIE	Environmental Impact Statement
CNPS	National Social Insurance Fund
CIE	Inter –Ministerial Committee
EIE	Environmental Impact Assessment
PPE	Personal Protective Equipement
HSE	Health Safety Environment
MINIMDT	Ministry of Mines, Industries and Technological Development
MINEP	Ministry of Environment and Nature Protection
MINEPDED	Ministry of Environment Protection of Nature and Sustainable Development
MINTSS	Ministry of Labour and Social Security
MTN	Mobile Telephone Networks
PAD	Douala Port Authority
HSSE	Health, Safety and Environment
QHSE	Quality Health Safety Environment
RIA	Fire Extinguish system
S.A	Anonym Company
AIDS	Acquired Immunodeficiency Syndrome
HIV	Human Immunodeficiency Virus

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RESUME NON TECHNIQUE

Le promoteur de la société AFISA S.A a décidé de créer une unité de transformation du blé en farine. Au Cameroun, La réalisation d'un tel projet ne peut se faire au détriment des normes environnementales et de la réglementation en matière de gestion environnementale. Dans ce contexte, AFISA S.A, entreprise citoyenne pour se conformer à la réglementation en vigueur en matière de gestion environnementale, notamment la loi 96/12 du 05 août 1996, qui exige à tout promoteur de réaliser une étude d'impact environnementale, s'est attaché les services du bureau d'étude techniques GES Consulting Sarl pour effectuer cette étude.

En vue de réaliser l'étude, l'équipe GES Consulting a utilisé une approche méthodologique comprenant trois étapes et le traitement des données. La première étape est la reconnaissance du site : qui a consisté à des visites sur le site et à la prise de contact avec les parties prenantes ; la deuxième étape est la rédaction des notes informatives sur le projet et lettre d'invitation aux consultations publiques, la troisième étape a consisté à la remise des notes informatives et les lettres d'invitation aux acteurs concernés. La recherche quant à elle, s'est faite à travers l'exploitation des rapports d'études effectuées dans la zone du projet et l'exploitation des documents en ligne.

Le traitement des données a abouti à une analyse qualitative.

En plus, les outils utilisés ont été la matrice d'interaction, la grille d'évaluation, la matrice de Léopold, Google Earth, les fiches de consultation individuelle, les fiches d'enquêtes, les fiches de recueil de données et la check List. L'approche méthodologie et les outils utilisés ont contribué à l'élaboration du rapport d'étude d'impact environnemental et social sommaire du projet de construction et d'exploitation de la minoterie. Le contenu de ce rapport est le suivant :

L'introduction donne un aperçu sur le contexte du projet et de l'étude, l'objectif, le but de l'étude d'impact environnemental et social, décrit la méthodologie de l'étude et se termine par la présentation du promoteur et du bureau d'étude.

Le rapport décrit ensuite le cadre juridique international qui retrace l'ensemble des conventions ratifiées par le Cameroun, le cadre juridique national et les institutions nationales ayant un lien direct avec le projet.

Le chapitre sur la description du milieu présente l'environnement physique, biologique et humain du site. En effet, le projet se réalise dans l'arrondissement de Douala 1er, département de Wouri, région du Littoral au Cameroun. Dans la zone d'étude le climat est du type équatorial, avec deux saisons annuelles, dont l'une chaude et l'autre humide. La formation végétale présente Les zones

marécageuses boisées constituées des espèces telles que l'Oxystigna manii (bosipi) et quelques Raphia vinifera (raphia), La forêt littorale dans la plaine sablonneuse qui se caractérise par la présence de Saccoglottis (bidou), Lophira alata (bongossi) et La végétation de la mangrove composées d'espèces comme le Rhizophora racemosa (palétuvier rouge) et Avicennia nitida (palétuvier noir). La population est cosmopolite, composée des autochtones et des personnes venues d'autres régions du Cameroun.

La description du projet porte sur la construction et l'exploitation d'une minoterie. Il s'agira de construire des bâtiments administratifs, bâtiments techniques, d'équiper les espaces techniques en machines, d'approvisionner l'usine en matières premières et de lancer la production c'est-à-dire la transformation du blé en la farine

Au regard des activités du projet, une réunion de consultation publique s'est tenue avec les autorités traditionnelles, la société civile et les populations riveraines du projet. Cette réunion de consultation publique avait pour but de recueillir les avis et compléter l'identification des impacts des activités du projet sur les composantes du milieu.

L'analyse des impacts des activités du projet et mesures d'atténuation a été faite grâce à une fiche d'impact qui permet d'identifier, de caractériser l'impact, de l'évaluer et de proposer des mesures d'atténuation pour ceux qui seraient significatifs et des bonifications pour les impacts positifs.

Il ressort clairement de l'analyse de ces impacts potentiels que les plus significatifs à toutes les phases du projet sont :

Pour les impacts négatifs (nuisance olfactive ; nuisance sonore ; risque d'accident ; ; risque pollution de l'eau ; risque pollution de l'air ; production des déchets, perte d'emploi, risque en matière de santé et sécurité

Pour les impacts positifs (le développement de l'économie locale, régionale et nationale ; la création d'emplois).

Cependant, il faut noter que les impacts jugés négatifs sont maîtrisables pour la plupart au vu des mesures d'atténuation préconisées telles que :

- Planter les arbres fruitiers autour du site ;
- Disposer d'un responsable HSSE pour le suivi des activités,
- Faire en permanence les visites et révisions techniques des véhicules et engins ;
- Équiper les ouvriers en casques anti bruit et bouchons d'oreilles ;
- Prévoir un service d'infirmerie pour les premiers soins et un médecin de travail ;
- Équiper le personnel en EPI et veiller à leur utilisation ;
- Faire enlever les déchets dangereux par des services spécialisés ;

- Sensibiliser les ouvriers et les populations sur les IST/SIDA;
- Faire un audit environnemental et social de l'entreprise avant le démantèlement
- Remettre le site en état;
- Vidanger, nettoyer et rincer des circuits des effluents liquides et les cuves ;
- Discuter avec le MINTSS et les syndicats des conditions de liquidation des droits des employés

La mise en œuvre de toutes ces mesures d'atténuation implique l'élaboration d'un plan de gestion environnemental et social.

Ce plan présente le résumé des impacts significatifs tant positifs que négatifs, les plans de surveillance et de suivi, la matrice synoptique de mise en œuvre du PGES, et le coût de mise en œuvre de ces mesures qui est estimé à vingt-deux millions cinq cent mil francs CFA (22 500 000 FCFA) soit sept millions cinq cent mil francs CFA (7 500 000 FCFA) en phase d'aménagement et de construction et quinze millions de francs CFA (15 000 000 FCFA FCFA) en phase d'exploitation.

NON TECHNICAL SUMMARY

The promoter of AFISA S.A. has decided to create a wheat-processing unit which will process the product into flour. In Cameroon, the implementation of such a project cannot be done at the expense of environmental standards and environmental management regulations. In this context, AFISA S.A, a socially responsible company, in order to comply with the regulations in force in terms of environmental management, in particular law 96/12 of 5 August 1996, which requires all promoters to carry out an Environmental Impact study, has engaged the services of the technical consultancy GES Consulting Sarl to carry out this study

In order to carry out the study, GES Consulting team used a methodological approach consisting of three stages and data processing. The first stage was site survey, which consisted of site visits and contact with stakeholders; the second stage was the drafting of project briefing notes and invitation letters to public consultations; the third stage consisted of the delivery of briefing notes and invitation letters to stakeholders. The research was done through the exploitation of study reports carried out in the project area and the exploitation of online documents.

The data processing resulted in a qualitative analysis. In addition, the tools used were the interaction matrix, the evaluation grid, the Leopold matrix, Google Earth, individual consultation sheets, survey sheets, data collection sheets and the checklist. The methodological approach and the tools used contributed to the elaboration of the summary environmental and social impact assessment report for the construction and operation of the flourmill. The content of this report is as follows:

The introduction, which gives an overview on the background of the project and the study, the objective of the environmental and social assessment; it describes the methodology and ends with the presentation of the promoter and its partners.

The report describes the international legal framework that traces all the conventions ratified by Cameroon, the national legal framework and the institutions having a direct link with the project.

The chapter on the description of the environment presents the physical, biological and human environment of the site. The project is located in the Douala 1er subdivision, Wouri division and Littoral region of Cameroon. The climate in the study area is equatorial, with two annual seasons, one hot and the other humid. The vegetation formation consists of swampy wooded areas with species such as *Oxystigma manii* (bosipi) and some *Raphia vinifera* (raffia), the littoral forest in the sandy plain which is characterized by the presence of *Saccoglottis* (bidou), *Lophira alata* (bongossi)

and The mangrove vegetation composed of species such as *Rhizophora racemosa* (red mangrove) and *Avicennia nitida* (black mangrove). The population is cosmopolitan, made up of natives and people from other parts of Cameroon

The project description concerns the construction and operation of a milling plant. It will involve the construction of administrative buildings, technical buildings, equipping the technical areas with machinery, supplying the factory with raw materials and starting production, i.e. the transformation of wheat into flour.

In view of the project's activities, a public consultation meeting was held with the traditional authorities, civil society and the populations in the project's area. The purpose of this public consultation meeting was to gather opinions and complete the identification of the impacts of the project activities on the components of the environment.

The analysis of the impacts of the project's activities and mitigation measures was carried out by means of an impact sheet which makes it possible to identify, characterize and assess the impact and to propose mitigation measures for those that are significant and improvements for positive impacts.

It is clear from the analysis of these potential impacts that the most significant at all stages of the project are:

For negative impacts , we have odour nuisance; noise nuisance; risk of accidents; risk of water pollution; risk of air pollution; production of waste, loss of employment, health and safety risk

For positive impacts, we have development of the local, regional and national economy; and job creation).

However, it should be noted that the most significant negative are manageable in terms of the proposed mitigation measure are

- Plant fruits trees around the site ;
- Have an HSSE manager to monitor activities,
- Carry out permanent technical inspections of vehicles and machinery;
- Equip workers with noise-cancelling helmets and earplugs ;
- Provide a nursing service for first aid and an occupational doctor;
- Equip staff with PPE and ensure its use;
- Have hazardous waste removed by specialist services ;
- Raise awareness among workers and population on STI/AIDS;
- Conduct environmental and social audit of the company prior to dismantling

- Restore the site;
- Drain, clean and rinse circuits of liquid effluents and tanks;
- Discuss with the MINTSS and Unions the conditions of liquidation of employees rights

The implementation of all these mitigation measures requires the development of an Environmental and Social Management Plan.

The Environmental and Social Management Plan gives the summary of significant positive and negative impacts, monitoring plans, synoptical matrix of the ESMP implementation of environmental and social clauses and the cost of implementing the measures estimated at

Twenty-two million five hundred thousand CFA francs (22 500 000 FCFA) thus **seven millions five hundred thousand CFA francs (7 500 000 F CFA)** for the construction phase and **fifteen millions CFA francs (15 000 000 FCFA FCFA)** for the operation phase.

CHAPTER 0. GENERAL INTRODUCTION

0.1. Context and justification of the project

Promoters of the AFISA flour mill construction and operation project. S.A, concerned about the application of the framework law in terms of environmental management in Cameroon, have undertaken to carry out the environmental impact study. This is to comply with the regulations in force, in particular Order No. 00001/MINEPDED of February 08, 2016 setting the categories of operations whose implementation is subject to an Environmental Impact study. This text is a follow up of Decree No. 2013/00171/PM of February 14, 2013 laying down terms for carrying out Environmental and Social Impact Assessment resulting from Framework Law No. 96/12 of August 5, 1996 relating to the protection of the environment.

After approval of the ToRs at the Ministry of the Environment, Protection of Nature and Sustainable Development (MINEPDED) by correspondence No. TR/0121/L/MINEPDED/CAB/CST of July 08, 2021 to carry out the Summary Environmental Impact of the project to build and operate a flour mill in Essengue Douala, the Technical Design Office (BET) GES CONSULTING Sarl approved by MINEPDED, under No. A/EIE-AE No. 0003 of 26 January 2021 under took the mission entrusted by the promoters of the project.

0.2. Interest of the study

The impact Assessment makes it possible to determine the environmental components that will be negatively or positively impacted during the implementation of the project and when the installations are operational. In order to better highlight all aspects, it takes into account the opinions of individuals, groups and communities affected by the project.

0.3. Objectives of the study

0.3.1. Main objective

The impact Assessment report will serve as a basic document for the monitoring and implementation of all the measures proposed to minimise the negative impacts and enhance the positive impacts resulting from the effective implementation of the project. This will allow the promoter to provide himself with a roadmap established in the form of an action program allowing him to remain in compliance with environmental standards while developing his activity on the socio-economic level, which would void him of disappointments with the supervising ministry

0.3.2. Specific objective

Specifically, it intends to :

- Describe the receiving environment ;
- Identify, analyze, characterize the positive and negative impacts of activities on the physical, biological and social environment in collaboration with the civil society ;
- Recommend measures for the management, prevention, mitigation, minimization or enhancement of significant impacts ;
- Develop an Environmental and Social Management plan

0.4. Environmental classification

The AFISA project is the construction of an agro-industry for flour production according to the environmental framework law. It is therefore subject to an Environmental Impact Assessment according to Order No. 0001/MINEPDED of 8 February 2016 setting out the different categories of operations whose implementation is subject to an Environmental Impact Assessment. This study falls under article 5-IV-G- in which construction activities of commercial establishments generating nuisances is subjected to a summary Environmental Impact Assessment.

0.5. Presentation of the project Owner: Africa Food Industry S.A (AFISA)

AFISA is a flour production company based in the port area of Douala and which has the ambition to expand its activities. Its identification sheet is as follows

- Company name : AFISA
- Social regime : S.A.
- RCCM N°: RC/DLA/2018/M/4572
- Taxpayer number : M011512248434E
- Managing Director : Mr DJOFANG Cyrille
- Number of jobs : 150

0.6. Presentation of the consultant

GLOBAL ENVIRONMENT AND SERVICES (GES CONSULTING) is an engineering and consulting firm run by a panel of highly trained experts who have proven themselves in several national and international organizations.

GES CONSULTING Sarl is approved by MINEPDED under the number A/EIE-AE N°003 of 26/01/2021 for the realization of Environmental Impact Assessments and Environmental Audits in Cameroon. Committed to the process of sustainable development, GES CONSULTING works mainly in Cameroon and aims to extend its action in the Central African Sub-Region.

Since its creation, GES CONSULTING has built up a network of resource persons covering a wide range of expertise. Our team can therefore intervene at any time and in any place in an efficient and rapid manner.

GLOBAL ENVIRONMENT AND SERVICES has at its disposal analysis software, state-of-the-art measuring and sampling equipment and a multidisciplinary team composed of

- A mission leader, an expert in environmental management, with skills and experience in carrying out environmental studies ;

- A socio-economist expert with three (3) years of experience in the field of environmental management ;

- A civil engineer with at least 5 years of experience in the field of environmental assessment of production facilities;

- A geographer with at least three (3) years of experience ;

The know-how developed by the experts of the team over the years allows them to advise clients and suppliers on technical solutions.

0.7. Methodological approach

In order to achieve the above objectives and obtain the expected results, the consulting firm has set up a team of multidisciplinary experts with experience in the environment, food and chemical industries, fire safety, sociology and civil engineering. It intends to rely on a human approach integrating all the stakeholders, i.e. employees, local populations, local public administration officials and civil society. The methodological approach used includes the following essential steps

- Site reconnaissance ;
- Collection of primary and secondary data ;
- Identification of impacts ;
- Identification of measures ;
- Stakeholder consultation ;
- Synthesis of data and production of a report, the content of which is defined by the legislation.

0.7.1. Preparatory phase : Secondary data collection and preliminary analysis

All reports and documents produced so far on the environment and development of the Littoral Region were researched and analyzed in order to gather, examine and make judicious use of all the information available on the area, with a view to preparing the field data collection tools required for the study. This information was also collected from specialised institutions working in

the area, from the central and local services of the competent administrations and from resource persons.

0.7.2. Field missions : Primary data collection and public consultations

Fieldwork was organized into three missions :

- The first mission gave room for a preliminary diagnosis from which the information needed for the design of the data collection tools for the environmental study will be derived.
- Based on the information gathered during the following stages: data collection; documentary analysis; the first and second field missions were inscribed as part of the study, thereby giving room to field visits and field observations in the zone of insertion of the project, to analyze the processes and to take samples of the elements to be analysed. In addition, during these missions, various meetings were organised with the various actors involved in the activity.
- The third field mission took place after the first stage of data processing and report writing. This third field mission gave room to consultation with the various stakeholders in the project, notably the administrative authorities, local technical service managers, local elected officials, managers of other facilities adjacent to the construction site and those of projects underway in the locality, non-governmental organizations operating in the project area of influence, local populations, etc., in accordance with the regulations in force.

The public consultation took place according to the program previously established during the first mission. It had the following objectives

- To allow stakeholders to express themselves, to share their concerns and apprehensions regarding the negative externalities of the project ;
- To collect relevant information to be taken into account in the conduct of the study ;
- Complete the identification of the project impacts and consider, with the parties concerned, efficient and appropriate measures to eliminate and mitigate the project impacts.

0.7.3. Data analysis and drafting of the study report

The aim here is to consolidate and harmonise the data collected from the field activities and the literature review, so as to provide relevant information on (1) the physical environment (geology, hydrology, topography, air, soils, climate, current sources of air pollution, water quality in the receiving environment), (2) the biological environment (flora and fauna), and (3) the human environment (demographics, ethnic composition, land use, social infrastructure, community structures, customs, etc.).

- **Description of the project, the processes used and the effluents generated**

This section describes in detail the stages of the project, starting with site development, construction and operation.

- **Identification Analysis of the impacts of the activities on the environment**

Identification, characterisation and assessment of impacts

The identification of impacts was done firstly through interviews and field observations to determine potential impacts and secondly through the use of the Leopold matrix method to determine the impacts that are likely to occur.

Characterization of impacts

Once it is established that an impact is occurring or is likely to occur, it will be characterized. Direct and indirect positive and negative impacts and, where appropriate, cumulative and irreversible impacts associated with the proposed works will be considered. Well-defined and relevant criteria have been used for the characterization of the different impacts.

Impact Significance Assessment

The significance of an impact is a measure of the consequences of the project on the affected environmental component. The significance of an impact can be major, medium or minor. To assess the significance of impacts, we used the Martin FECTEAU grid, which combines three parameters (intensity, duration, extent).

Measures to correct, mitigate and/or compensate for negative impacts

Having identified and analyzed the impacts and their significance, appropriate measures were considered to reduce or at best eliminate those that are negative and enhance those that are positive.

0.7.4. Validation of the draft report and production of the final report

Following the processing, analysis and interpretation of the data, a draft impact assessment report is produced. This is sent to the promoter and other stakeholders for amendment. The incorporation of comments from these reviewers (stakeholders) into the draft report results in the production of the final study report. The final environmental and social impact study report is then sent to MINEPDED for validation and production of the certificate of conformity.

0.8. Structure of the report

This ESIA report is the result of the work of an interdisciplinary panel of experts: civil engineers, sociologists and environmentalists with experience in environmental impact assessment.

- It consists of the following parts
- A Non Technical Summary (French / English),
- The general introduction
- Chapter 1, which sets out the legal framework and the national and international regulatory texts to which the project is subject
- Chapter 2, which presents the installation site, highlighting the environmental components likely to be affected by the construction and operation of the installations to be built;
- Chapter 3, which describes the project and concludes with a note on the the sources of impacting activities ;
- Chapter 4, which deals with site visits and stakeholder opinions. The opinions of the people met are mentioned, as well as the meeting with the neighborhood held with about 35 participants ;
- Chapter 5 describes the potential impacts that all phases of the project may face. It ends with a list of significant impacts and proposed measures ;
- Chapter 6 deals with the Environmental and Social Management Plan, giving the measures for improving or minimizing potential impacts;
- The report ends with a conclusion, some recommendations, a literature review and annexes.

CHAPTER I. REVIEW OF THE LEGAL AND INSTITUTIONAL FRAMEWORK

The project under study is governed by laws relating to both environmental management and wheat flour production. In addition to the legislation, there are institutional actors involved in the implementation and operation of the project for the construction and operation of a wheat flour mill

1.1. International legal framework

From the Stockholm Conference (1972) through the Rio de Janeiro Conference (1992) to the Johannesburg Conference in 2002, environmental protection is one of the major challenges for economic development in the third millennium. Principle 1 of the Rio Declaration states that "Human beings are at the centre of concerns for sustainable development. They have the right to a healthy and productive life in harmony with nature. Principle 7 states that: "National policies should provide for environmental impact assessment when measures are likely to have serious consequences for forest resources and when such measures are subject to decision by a competent national body.

Principle 17 complements the first two by stating that Environmental Impact Assessment, as a national instrument, should be undertaken for proposed activities that are likely to have significant adverse environmental effects and are subject to a decision by a competent national authority. This study will be submitted to the Cameroonian authorities in charge of environmental issues for approval

Cameroon has signed and ratified several regional and international conventions on environmental protection. The various ratified conventions relevant to this environmental study are described below.

- United Nations Framework Convention on Climate Change

Adopted at the Rio Conference in June 1992 by 155 States, it was ratified by Cameroon in 1994. The convention deals with "the stabilization of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". It prescribes the achievement of this level within a time frame sufficient to that ecosystems can adapt naturally to climate change, that food production is not threatened and that economic development can continue in a sustainable manner.

The Convention is based on five principles and ten commitments by member states and is overseen by the Conference of the Parties, which is the highest body. The first principle makes the parties responsible for preserving the climate system for present and future generations, and the third obliges them to take precautionary measures to anticipate, prevent or mitigate the causes

of climate change and limit its adverse effects. It is in this respect that the present project is of interest insofar as, during the development phase of the project for the construction and operation of an agro-industry for the production of flour, it is planned to clear the land and strip the soil. In return, AFISA will have to create green spaces to preserve the stability of greenhouse gases in the atmosphere.

United Nations Convention on Biological Diversity (CBD)

This convention was signed by Cameroon on 22 May 1992 in Nairobi, Kenya and ratified in 1994. The objectives of this convention, adopted in 1992 at the UNCED in Rio de Janeiro, are: "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources". It sets out general obligations regarding conservation and sustainable use of resources, identification and monitoring of biological diversity, conservation, in situ and ex situ research and training, as well as education and public awareness and environmental impact assessment of activities that may affect biodiversity. AFISA shall carry out a survey of the useful plants present in the project area in order to avoid their destruction during the earthworks for their possible relocation or integration into the project.

- Hazard Analysis Critical Control Point

Food safety is a major concern for the food industry. To control this risk, companies in this sector have a tool at their disposal to prevent biological, chemical and physical risks. This is the HACCP method, which stands for "Hazard Analysis and Critical Control Point". The HACCP (Hazard Analysis Critical Control Point) approach is a multi-step process for controlling hygiene in establishments.

This approach is international in scope and originates from the work of the [Codex Alimentarius](#) (a programme bringing together the FAO and the WHO, whose objective is the safety of food, consumers and employees in the food sector).

- Codex Alimentarius

The Codex Alimentarius is a joint FAO/WHO programme on food standards used in food businesses and is recognized worldwide as the method of choice for food safety management and the prevention of food borne disease. General Principles of Food Hygiene are established to provide a sound basis for ensuring food hygiene and should be used, where appropriate, in conjunction with each specific code of hygienic practice, as well as with guidelines governing microbiological criteria. They apply to the food chain from primary production to final consumption,

indicating the hygiene controls that must be exercised at each stage. In order to increase food safety, it is recommended that the HACCP system, as described in the Hazard Analysis Critical Control Point (HACCP) System and Guidelines for its Application, be used wherever possible.

As the wheat flour project is a food project, the promoter is expected to make every effort to ensure that the code of good manufacturing and hygiene practices is followed in order to protect the health of consumers. Cameroon is a member of WHO and FAO.

- Agreement on the Application of Sanitary and Phytosanitary Measures

This Agreement applies to all sanitary and phytosanitary measures which may, directly or indirectly, affect international trade. Such measures shall be developed and applied in accordance with the provisions of this Agreement. As indicated in the draft, wheat for processing by AFISA is mainly imported and should comply with the relevant standards. The WTO SPS Agreement states that : "In order to harmonise sanitary and phytosanitary measures to the greatest extent possible, Members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations"

1.2. National legal context

Cameroon has an arsenal of texts and laws governing environmental protection. The preamble of the Constitution of 18 January 1996 states very clearly : "Every person has the right to a healthy environment. The protection of the environment is a duty of all. The State shall ensure the defence and promotion of the environment". In general, there are laws, policies and regulations in favour of environmental management that have been adopted, including texts related to environmental impact studies.

1.2.1. Texts on environmental protection, sustainable natural resource management and the conduct of ESIA

➤ Law N° 96/12 of 5 August 1996 on the framework law on environmental management

This is the basic legal instrument for environmental protection. In its article 17, it prescribes that "any promoter or project owner of any development project, work, equipment or installation which risks, because of its size or nature, to damage the environment, is required to carry out, according to the specifications, an impact study to assess the direct and indirect impacts of the said project on the ecological balance of the area where it is to be implemented or of any other region, the living environment and quality of life of the population and the impacts on the environment in general". The project for the construction and operation of a wheat flour mill in the port area of the

Douala Sub-Division. Article 19, paragraph 2 of this law sets out the main points that must be included in an environmental impact assessment. Articles 21 to 39 deal with the protection of receiving environments. They protect them from any kind of degradation or contamination by toxic products.

➤ **Law No. 98/015 of 14 July 1998 on establishments classified as dangerous, unhealthy or inconvenient**

This law governs compliance with the principles of environmental management or public health protection. It specifies in articles 5, 7, 9 and 12 that the person in charge of a first class establishment is obliged to carry out, before the opening of the said establishment, a study of the dangers according to the methods fixed by regulation. Thus, the directorate in charge of classified establishments delimits a safety perimeter around these establishments within which housing and all activities incompatible with their operation are prohibited. The operator of any classified establishment is required to draw up an emergency plan to be approved by the competent administration and those generating pollution must carry out self-monitoring. Given the activities of the facilities, this agro-industry is subject to this law and will have to undergo a hazard study. According to articles 25 and 26, classified establishments that pollute the environment are subject to the payment of the annual pollution tax and those that undertake actions to promote the environment benefit from a deduction from taxable profits according to the terms of the finance law. The project promoter must take all measures to ensure the safety of people, equipment and installations.

➤ **Law N°92/007 of 14 August 1992 on the Labour Code**

It organises the labour relations between workers and employers as well as between the latter and apprentices placed under their authority. According to Article 2(1), the right to work is recognized as a fundamental right of every citizen. The State must do everything possible to help them find a job and keep it once they have obtained it. The implementation of the structure requires the establishment of administrative documents that help in the proper management of working conditions, wages, hygiene, health and safety in the workplace, and social security. This law applies to the AFISA project which will have to meet these regulatory requirements as it will use local paid labour.

➤ **Law N°77/11 of 13 July 1977 on the repair and prevention of work accidents and occupational diseases**

Article 17(2) of this law stipulates that the employer is obliged to declare within three working days any work accident or occupational disease that occurs in the company. This period runs from the day of the accident or the day of the determination of the occupational nature of the disease or from the day on which the employer became aware of the accident or disease. In the context of this project, the employer is required to comply with the regulations in force on the compensation and prevention of occupational accidents and diseases.

➤ **Law No. 64/LF/23 of 13 November 1964 on public health protection**

This law lays down, among other things, the qualities that beverages and foodstuffs must meet, as well as the rules for the conservation and protection of these beverages or foodstuffs. The AFISA project must comply with this law by making adequate provisions for the health of consumers, workers and the population.

➤ **Law No. 64/LF/23 of 13 November 1964 on public health protection**

This law lays down, among other things, the qualities that beverages and foodstuffs must meet, as well as the rules for the conservation and protection of these beverages or foodstuffs. The AFISA project must comply with this law by making adequate provisions for the health of consumers, workers and the population.

Law N° 98/005 of 14 April 1998 on the water regime.

The legal framework of water as well as the provisions relating to its safeguarding, management and protection of public health are fixed by this law. In its article 4, it prohibits acts likely to alter the quality of surface and underground water or the sea, or to harm public health as well as aquatic or underwater fauna and flora.

Similarly, Article 6 of this law provides that any natural or legal person who owns installations likely to cause water pollution must take measures to limit or eliminate the effects. Chapter II specifies the penal sanctions for any person who violates the principles in its article 15, it states the following :

- Any person who, in violation of the provisions of this law and/or its implementing texts, takes surface or groundwater in violation of the provisions of this law and/or its implementing texts, shall be punished by imprisonment of two (2) to five (5) years and a fine of five million (5,000,000) to ten million (10,000,000) CFA francs, or one of these two penalties only
- Carries out a surface water or groundwater abstraction that does not comply with the criteria, standards and measures set out in the impact study ;
- Prevents the performance of controls, monitoring and analyses provided for by this law and/or its implementing regulations ;
- Operates a water collection, treatment and storage facility in violation of the provisions of this law and/or its implementing regulations ;

- Offers drinking water to the public without complying with the quality standards in force;
- Violates a protection perimeter around water catchment, treatment and storage points
- The AFISA company is required to comply with the above principles.

➤ **Law N°2004/003 of 21 April 2004 governing urban planning in Cameroon**

Stipulates in its article 10 that "urban planning studies must integrate environmental impact studies prescribed by the legislation relating to environmental management".As such, it sets the general rules for land use, defines the forecasts, rules and acts of urban planning, organises land development operations and the relations between the different urban actors. It draws up a land-use plan that sets out the use of land and the rules governing it for the medium term (10-15 years). It also defines the perimeter of each land use zone and lays down the rules, restrictions and special easements for land use in each zone. The easements of passage (access roads) which will be created within the framework of this project will be the object of particular attention by the departmental delegation and the commune of Douala I which will proceed to a delimitation.

➤ **Law n°98/20 of 24 December 1998 governing gas and water vapour pressure equipment**

Intended for use on land, on board inland waterway vessels, aircraft or in maritime installations under a pressure of more than one (1) effective bar; Any gas or water vapour pressure apparatus is subject to prior declaration before use, under conditions laid down by regulation. Apparatus manufactured in Cameroon or imported must be approved by the administration in charge of the said apparatus before being used or put into service, under conditions laid down by regulation. This provision also applies to equipment that has undergone repairs or significant modifications during its operation.

Equipment in service must be subjected to a periodic test. The periodicity of the renewal of the test shall be determined by regulation.

This law applies to the AFISA project, which will use low-pressure equipment, boilers and other utilities.

➤ **Law n° 2004/018 of 22 July 2004 laying down the rules applicable to Councils.** Councils are basic territorial authorities whose general mission is local development and the improvement of the environment and living conditions of their inhabitants. This law also transfers to them the following competences in the field of water and sanitation. These include the supply of drinking water ; the protection of underground

and surface water resources ; and the fight against insalubrity, pollution and nuisances. The project site is located in the Douala I.

➤ **Law N° 2015/018 of 21 December 2015 governing commercial activity in Cameroon**

This law governs commercial activity in Cameroon, specifies the conditions of exercise, the modalities of distribution, sale and determination of prices, services related to the guarantee of products and after-sales service, the conditions of organization of commercial events, illicit, misleading and aggressive commercial practices.

This law shall apply to any trader, natural or legal person, Cameroonian or foreign, operating on the national territory ; it shall also apply to all production, distribution and service activities. In Cameroon, any commercial activity must have the aim of contributing to the stimulation of the production of goods and services, as well as competitiveness, the creation of job-creating enterprises, the rationalization and reorganization of the distribution circuits of goods and services, the satisfaction of consumer needs in terms of availability, quality of goods and services offered and price, and the fight against poverty. This law therefore calls for the animation of urban and rural commercial life. AFISA's activity is subject to this requirement and consequently this law applies to this project.

➤ **Law No. 98/013 of 14 July on competition**

This law defines the conditions for the exercise of competition in the internal market. The provisions of this law are applicable to all sectors of the national economy, to all operations of production and/or marketing of products and services carried out on the national territory by natural or legal persons, public, semi-public or private. It also regulates anti-competitive practices in the context of relations between competitors or potential competitors operating at the same level of production or marketing; relations between non-competitors undertakings operations at different levels in the production and/or marketing chain; unilateral measures taken by an undertaker or group of undertakers in a dominant position on the market. 2) The anti-competitive practices referred to above are those resulting from agreements and understandings established between undertakers ; abuses by an undertaker or group of undertakers in a dominant position; mergers and acquisitions of undertakings. The project must comply with these regulations with regard to product prices.

➤ **Law No. 2018/020 of 11 December on the framework law on food safety**

This law establishes the principles and regulatory bases relating to food, feed for human consumption and food additives and supplements to ensure a level of protection of life, health of

consumers and respect for the environment. The provisions of this law apply to the activities of production, manufacture, preparation, handling, packaging, storage, transport, packaging, preservation, import, export, distribution, sale of food or any other related activity. Because the AFISA project concerns the production of food products, this law applies to the latter

➤ **Law No. 096/11 of 5 August 1996 on standardization**

This law and the regulatory texts adopted for its implementation shall govern standardization in the Republic of Cameroon. Standardization is the establishment of requirements, specifications or technical rules applicable to products, goods or services. Its purpose is to provide reference documents of national, sub-regional, regional or international scope, containing solutions to technical and commercial problems concerning products, goods and services which arise repeatedly in relations between partners, particularly economic, scientific, technical and social partners. It should be noted that according to this law, any economic activity carried out in Cameroon may be subject to quality control of products, goods and services. Quality control of a product, good or service is the set of operations which consist in determining whether this product, good or service meets the requirements and specifications of the standards in force. AFISA's food products shall meet the requirements and specifications of the standards in force in Cameroon.

➤ **Law No. 2011/012 of 6 May 2011 on consumer protection in Cameroon**

This law sets the regulatory framework for consumer protection. It applies in particular to transactions relating to the supply, distribution, sale, exchange of technologies, goods and services relating to consumer protection. These transactions concern in particular the pharmaceutical, food and water sectors. The national policy is inspired by treaties, laws and regulations with principles such as the principle of protection (the consumer has the right to protection of life, health, safety and the environment); the principle of satisfaction (satisfaction of basic or essential needs in the areas of health, food, etc.) the principle of equity (the right to full redress for damage suffered by suppliers or providers) and the principle of participation (the right of consumers to form associations or groups to defend their rights).

➤ **Law n°2019/024 of 24 December 2019 on the General Code of Decentralised Territorial Authorities;**

Within the meaning of the above law, decentralised territorial authorities are Regions and councils carrying out their activities in the respect of national unity, territorial integrity and the primacy of the State.

To this end, the Territorial Communities are legal persons under public law. They enjoy administrative and financial autonomy for the management of regional and local interests and regulate, by deliberation, the affairs of their competence.

1.2.2. Decrees

➤ **Decree No. 2013/0171/PM of 14/02/2013 establishing the modalities for carrying out Environmental and Social Impact Studies**

This decree sets out the content of the different types of studies, notably the summary and detailed environmental impact studies which this project is subject to. It sets out the procedure for carrying out these studies, the fees to be paid, and the procedures for carrying out consultations and public hearings (Articles 13 to 22). It also defines in its Article 25 paragraph 2 that an environmental impact study, even if validated, becomes null and void three years later if the project for which it was carried out is not implemented. Finally, this decree sets out the procedure for environmental monitoring and follow-up of projects.

➤ **Decree No. 99/818/PM of 9 November 1999 establishing the conditions for the establishment and operation of establishments classified as dangerous, unhealthy or inconvenient**

This decree emphasizes that any person wishing to set up and operate an establishment subject to authorisation must submit a request to the head of the department in charge of classified establishments at the Ministry of Mines, Industry and Technological Development.

Article 10 of the order authorising the operation of an establishment classified as dangerous, unhealthy or inconvenient specifies the conditions for setting up and operating, as well as the technical requirements aimed at presenting either the dangers for health, safety, public health, agriculture, nature and the environment in general, or the inconveniences to the neighborhood. He shall obtain from the decentralized services of MINMIDT an operating permit.

➤ **Decree No. 93/720/PM of 22 November 1993 to lay down the modalities for the application of law No. 90/031 of 10 August 1990 governing commercial activity in Cameroon**

This decree defines the conditions for the exercise of trade, particularly with regard to activities of exchange of goods and services.

Health, safety and working conditions

In Cameroon, the legal framework governing all aspects of health, safety and working conditions applicable to industrial installations is composed of a set of laws and regulations, the most relevant of which for this study are, among others :

- **Decree No. 2015/1373/PM of 08 June 2015 to lay down the modalities for the exercise of certain competences transferred by the State to municipalities in the area of the environment.**

In the spirit of this decree, the State transfers to councils the following competences in the area of the environment :

- The monitoring and control of industrial waste management;
- The protection of ground and surface water resources.

- **Decree N° 2011/2585/PM of 23 August 2011 which regulates noise and olfactory nuisances.**

This decree regulates noise and olfactory nuisances throughout the territory. Article 3 lists the provisions of this decree which apply to all neighborhood, noise, including noisy activities or works that disturb the neighbourhood, establishments classified as dangerous, unhealthy or inconvenient, noise perceived inside mines and quarries, public and private worksites, mobile sources, works concerning buildings and their equipment subject to a declaration or authorisation procedure.

- **Decree No. 2012/2809/PM of 26 September 2012 establishing the conditions for the sorting, collection, storage, transport, recovery, recycling, treatment and final disposal of waste**

Within the meaning of this decree, Article 7 refers to inert waste and biodegradable agricultural waste which must be deposited by their generators or by persons authorised to manage them in the disposal places and facilities designated for this purpose by the decentralised territorial authorities.

(2) This waste may also be used to recover, treat or dispose of other categories of waste, except for hazardous waste.

(3) Other non-biodegradable agro-pastoral waste shall be treated or disposed of by authorised facilities.

. Waste from wheat processing shall be removed by legal entities approved by AFISA for its recovery.

1.2.3. Orders

- **Order n°0001/MINEPDED of 08/02/2016 establishing the different categories of operations whose implementation is subject to a Strategic Environmental Assessment or an Environmental and Social Impact Study**

Article 5 of the said order determines the operations or activities subject to a summary environmental and social impact assessment. Point IV-G-a) classifies flour mill project as a summary Environmental and Social Impact Assessment under this heading. The approved ToR specify the nature of the study to be carried out.

➤ **Order No. 0010/MINEP of 03 April 2013 on the organisation and functioning of Divisional Committees for monitoring the implementation of Environmental and Social Management Plans.**

The Committee thus created is placed under the chairmanship of the territorially competent Prefect with the Divisional Delegate of the Ministry of the Environment, Protection of Nature and Sustainable Development as vice. Its purpose is to monitor all environmental and social management plans within the jurisdiction of the Division. In this case, it is the Wouri Divisional Committee.

➤ **Order No. 039/MTPS/LMT of 26 November 1984 laying down general health and safety measures in the workplace.**

This decree lays down the basic general rules on hygiene and safety in the workplace with a view to protecting workers' health as effectively as possible.

➤ **Circular No. 000803/ANOR of 6 October 2010 on the certification of imported food products, raw materials, food additives and ingredients**

This circular is addressed to economic operators, importers of food products as well as raw materials, food additives and ingredients used in the composition of these products and whose standards are made mandatory, including the standard NC 04:2000-20, labelling of prepackaged foodstuffs. It also determines the conditions for assessing conformity, issuing and using the certificate of conformity to the standard.

1.3. Institutional framework of the project and the ESIA

1.3.1. National operational and strategic actors

At the national level, several institutions (governmental and non-governmental) are involved in the development and implementation of environmental impact assessments. The institutions concerned by this study are

- **The Ministry of Environment, Protection of Nature and Sustainable Development**

The Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED) is the main institution in charge of environmental management in Cameroon. This ministry has a

Sub-Department of Environmental Impact Assessments and service unit with a mission to supervise environmental studies.

MINEPDED has decentralized services at the Regional and Divisional levels. The territorially competent Divisional delegations of the Environment and Protection of Nature have the logistics required to carry out environmental control and monitoring missions under their responsibility. It is in this capacity that the Divisional delegation of Wouri will intervene in particular in the control and monitoring of environmental issues of the agro-industrial unit.

- **The National Consultative Commission for the Environment and Sustainable Development (CNCEDD)**

In order to strengthen government action, the National Consultative Commission for the Environment and Sustainable Development (CNCEDD), created by Decree N°94/259/PM of 31 May 1994, is also an institutional body. Its content is inspired by the recommendations of the Rio de Janeiro Conference and in particular those that advocate the establishment of institutional mechanisms capable of fostering the integration of ecological and socio-economic policies and promoting national sustainable development strategies.

- The Inter-ministerial Committee on the Environment

The Inter-ministerial Committee on the Environment (CIE) was established by Law No. 96/12 of 5 August 1996 on the framework law on environmental management. It was made functional by Decree No. 2001/718/PM of 3 September 2001 on the organisation and functioning of this institution. This decree was modified and completed by decree N°2006/1577/PM of 11 September 2006. The CIE is responsible for examining and validating the terms of reference and reports of environmental impact studies.

- The Wouri Divisional Monitoring Committee for the implementation of the Environmental and Social Management Plans

The Committee thus created and organized according to the order n° 0010/MINEP of April 03, 2013 is placed under the chairmanship of the territorially competent Prefect with the Divisional Delegate of the Ministry of Environment, Protection of Nature and Sustainable Development as vice. Its purpose is to monitor all environmental and social management plans resulting from ESIA's of projects within the jurisdiction of the Division.

- The Ministry of Mines, Industry and Technological Development

This ministerial department is directly concerned with the present study. It manages classified and commercial establishments and particularly monitors the induced effects that may result from their operation. It is responsible for issuing permits for the establishment of classified establishments. In addition, it is responsible for the control and operation of classified establishments; it has a control department which ensures that the nuisances resulting from industrial installations comply with the prescribed standards. Within the framework of this project and according to the regulations, in particular decree n°2012/432 of 01/10/2012, the ministry is also responsible for the promotion and defence of a quality label for products intended for the local market and for export in liaison with the administrations concerned, for the monitoring of standards and quality in liaison with the administrations concerned; In its article 1(4) it exercises the supervision over public and semi-public companies intervening in its sector of competence such as ANOR.

The Divisional Delegation of Wouri will intervene at this level to ensure the conformity of the products made in the framework of this project.

The Agency for Standards and Quality (ANOR)

Created by decree n°2009/296 of 17 September 2009, the Agency for Standards and Quality (ANOR) is a public administrative establishment with a legal personality and financial autonomy, placed under the technical supervision of the Ministry of Industry and the financial supervision of the Ministry of Finance. In liaison with the administrations and public and private organizations concerned, ANOR's mission is to contribute to the elaboration and implementation of Government's policy in the field of standardization and quality in Cameroon. To this end, it is responsible for

- The development and approval of standards
- Certification of conformity to standards ;
- The promotion of standards and quality approach among public and semi-public administrations and private sector organizations;
- Monitoring cooperation with international bodies and specialized committees in the field of standardization and quality;
- Conducting studies on standardization and developing proposals for measures to improve the quality of products and services and compliance with standards;
- The dissemination of information and documentation on standards and quality;
- All other missions that may be entrusted to it by the government in the field of standards and quality.

The Division of Quality Development

Following decree n°2005/260 of 15/07/2005 relating to the organisation of the Ministry of Industry, Mines and Technological Development, this division of quality development was created to replace standardisation and quality cell and has the following missions :

- Coordination of policies, strategies and programmes in the field of standardisation and quality, in liaison with the administrations and bodies concerned ;
- The definition of government's priorities in terms of the development and application of standards, in liaison with the administrations and bodies concerned;
- The elaboration and application of regulations relating to standards and quality, in liaison with the administrations and bodies concerned ;
- Monitoring the implementation of international agreements and treaties relating to standardization and quality, in liaison with the administrations and bodies concerned ;
- Approval of private quality control and certification bodies, as well as standardization offices ;
- The development of public-private partnership programmes and projects for the promotion of quality.

- **The Ministry of Labour and Social Security**

The Ministry of Labour and Social Security is responsible for the preparation, implementation and assessment of the State's policy and programmes in the areas of labour relations, workers' status and social security. As such, it is responsible for monitoring the application of the Labour Code, international conventions ratified by Cameroon and relating to labour, the development and implementation of welfare and social security policy, and liaison with institutions of the United Nations system and the African Union specialized in the field of labour. Through its decentralized services, the Wouri Divisional Delegations on the project site will ensure that working conditions are respected within the framework of the implementation of the project in accordance with the regulations in force. Because this project will create jobs, AFISA will have to use the services of this ministry for the proper management of working conditions, health and safety in the workplace. Furthermore, there is a collective agreement for the processing industries to which AFISA may adhere, which regulates the professional relationship between employers and workers as defined in Article 1 of the Labour Code, in companies in the processing industries operating in the territory of the Republic of Cameroon.

- **The Ministry of Trade**

The Minister of Trade is responsible for the elaboration, implementation and evaluation of the Government's policy in the field of trade.

In this capacity, he is responsible for :

- the development, implementation and evaluation of strategies for the promotion of Cameroonian products ;
- the elaboration of price regulations and the monitoring of their application, in liaison with the administrations concerned
- regulating the supply of consumer products, in conjunction with the relevant administrations
- the search for new markets for Cameroonian products ;
- the promotion and defence of a quality label for products intended for the local market and for export
- the promotion and control of healthy competition ;

In this respect, the Ministry of Trade will intervene in this AFISA project in the regulation of prices, the promotion and control of healthy competition, the promotion of local products both in the department and throughout the national territory. In this respect, the Ministry of Trade will intervene in this AFISA project in the regulation of prices, the promotion and control of healthy competition, and the promotion of local products both in the department and throughout the national territory.

1.3.2. Decentralized territorial collectivity

The study area is located in the port area, precisely in the Douala 1 Sub-Division. The municipality of Douala through its technical services (environment service, building permit service) will ensure that the rules of urban planning, roads and sanitation are respected during the life of the project.

1.3.3. Steering and monitoring actors

For the implementation of the project's environmental and social measures, various actors are involved in the monitoring and surveillance of these measures. These include institutional and strategic actors such as the Divisional ESMP monitoring committee, the Divisional Delegation of MINSANTE, MINMIDT, the AFISA SA company, civil society through the chiefs, and environmental protection associations.

CHAPTER II DESCRIPTION OF THE INITIAL STATE OF THE ENVIRONMENT SITE

2.1. Location of the project site and delimitation of the study area

2.1.1 Administrative and geographical location

The project site is located in the port area of Douala. The estuary port covers an area of 1000 hectares, 600 of which are in operation, and is geographically located at latitude 04°03'5 north and longitude 09°41'8.

Administratively, the study area is located in the Douala 1 Sub-Division, Wouri Division, Littoral Region of Cameroon.

Douala 1 Sub-Division is bounded to the east by the Douala II Sub-Division and to the north by the Banya River, which separates the Douala I Sub-Division from the Douala V Sub-Division.

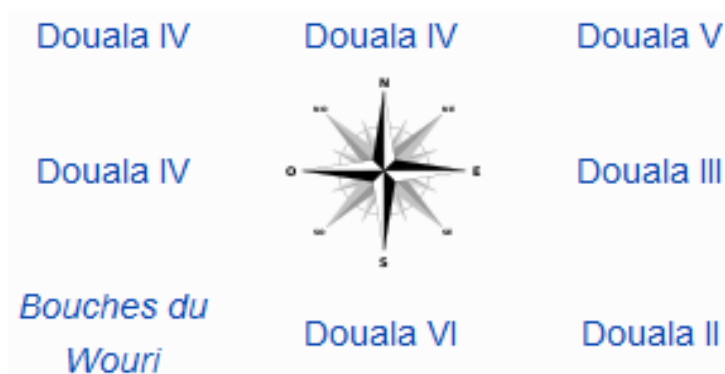


Figure 1: Sub-Divisions bordering Douala 1

2.1.2 Delineation of the project site and the zone of influence

The project site is located in the Essengue Quarter of Bell Paramount Chiefdom. Around this Quarter, there are the following quarters : Youpwé, the Bonandjo, Bonadoumbé, Koumassi, Bonapriso, old airport and the Bois de Singe quarter.

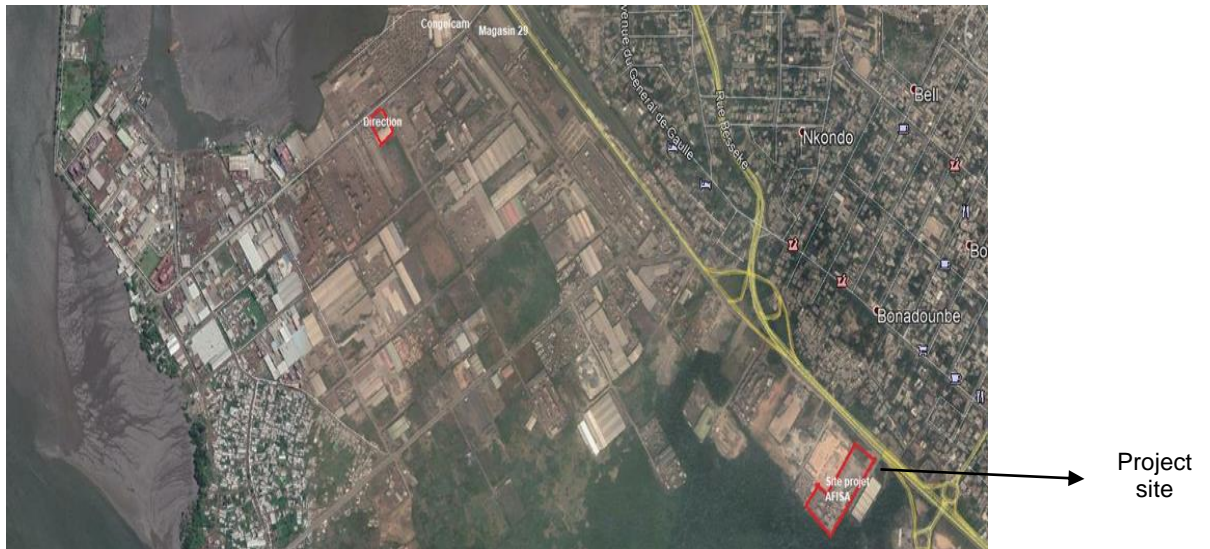


Figure 2: Location of the project site

2.2. Physical environment

2.2.1. Climate

Douala is located in the climatic regime of the northern coastal zone. The city is subject to a coastal equatorial climate, with two annual seasons, one hot and the other humid, represented as follows

- A dry season that runs from November to March ;
- A rainy season from March to November.

The study area as defined in the previous paragraph belongs to the equatorial Cameroonian climate, characterised by a more or less constant temperature of around 26° and very abundant rainfall (reaching 4,016 mm in Douala in 260 rainy days per year), particularly during the rainy season from June to October. The peak monsoon season is in July, August and September.

The average annual relative humidity is 83%. The average annual temperature is 26.4°C and varies very little.

2.2.1.1. Precipitation

An average of 4,000 mm of rain falls per year. There is an average of 180 rainy days per year, almost all of which are spread over nine months. December, January and February are the dry season months. In the rainy season, the maximum rainfall is 786 mm in August, 749 mm in July and 649 mm in September (see Figure 4 below). Some results of statistical analysis of daily rainfall in the oceanic regions of Cameroon are presented in figure below.

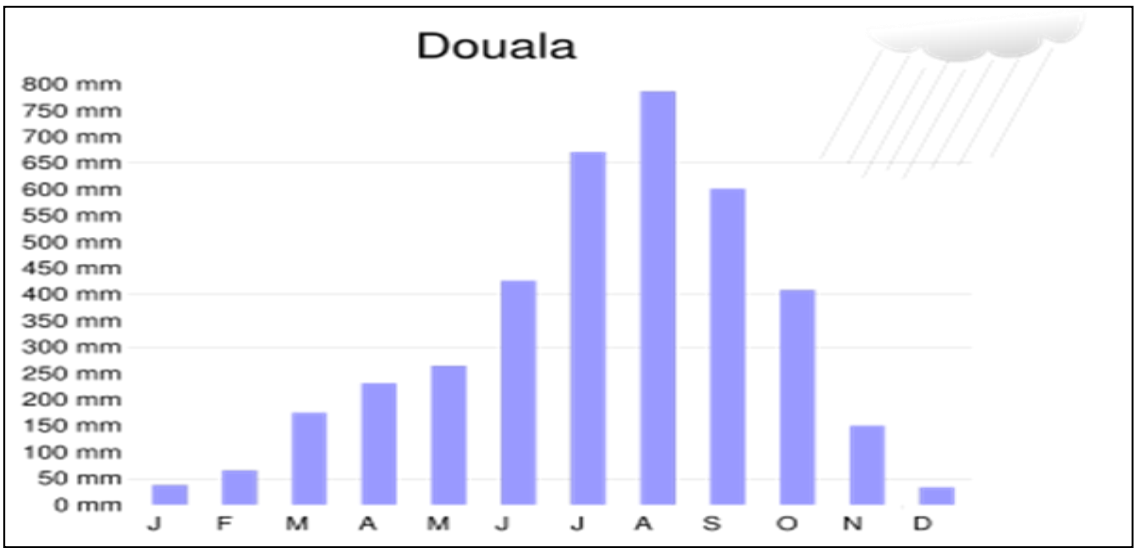


Figure 3: Rainfall in Douala (PDU, 2012)

2.2.1.2. Temperatures

Average temperatures vary little over the year and the temperature range is around 2.4°C. The maximum temperatures are reached in February (27.6°C) and the minimum in July (24.8°C).

The degree of humidity decreases somewhat as one moves away from the coast; the night temperature is about the same as the day temperature. Close to the equator, night and day are roughly equivalent in Douala throughout the year, with sunset at around 6pm. The figure below shows the temperature curve for Douala.

Courbe de température à Douala

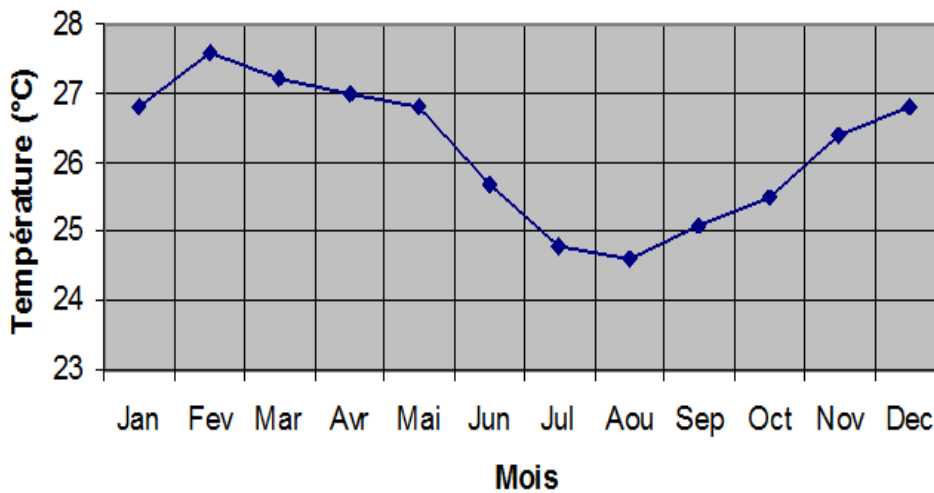


Figure 4: Temperature in Douala (PDU, 2012)

2.2.1.3. Relative humidity

The relative humidity in the city of Douala is high and varies between 79% in February and 88% in August, reflecting the high water vapour content of the atmosphere. These values can drop in the dry season to values between 50 and 60%.

2.2.1.4. Air masses

The air masses usually blow in a south-westerly direction. They are warm and humid and correspond to the propagation direction of the monsoon. The speed ranges from 0.5m/s to 1m/s at 6 am and from 2.5m/s to 3m/s at 12 pm.

2.2.1.5. Atmospheric humidity

It is very high. The saturation level is reached in the wet season.

2.2.1.6. Wind speed

The parameters considered in the wind study are the direction and strength of the wind, as these parameters play an important role in the dispersion of dust and gases associated with the operation of the sawmill. Overall, the study area, like Douala in general, is dominated by calm winds, sweeping across the study area in a north-south direction.

2.2.2. Soils

The study area is located on a coastal zone dominated by sedimentary formations. It has hydromorphic soils, which are subject to excess water. The figure below gives a representation of different soil zones.

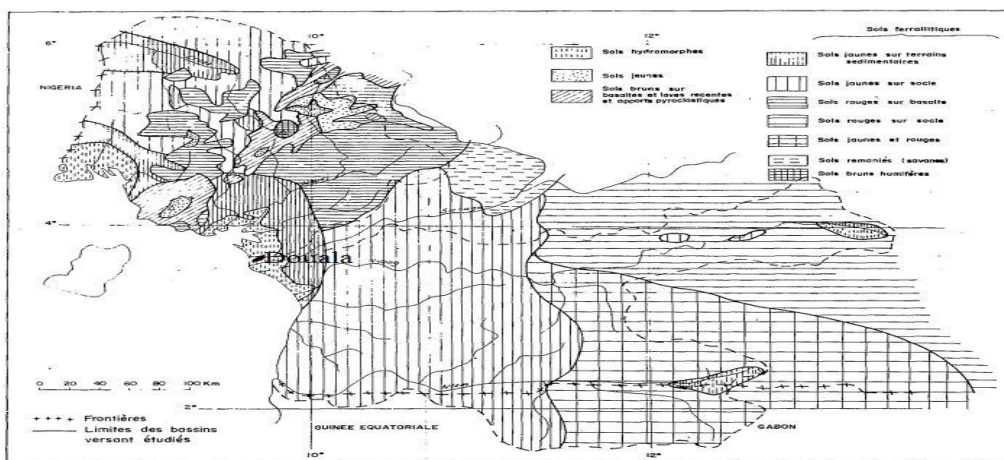


Figure 5: Soilology of the Douala region (Olivry, 1986)

In places it is dominated by sandy-clay and sandy-clay formations and consists of :

- Lowlands formed by more or less consolidated recent alluvial deposits which have a good capacity to retain water ;
- Plateaus and sedimentary hills formed by recent, poorly consolidated alluvium.

These geological formations have a pedagogical profile which shows more or less clayey sands over a large thickness, quartz gravels alternating with variegated sandy clays. They have a low humus layer and consequently have a low agricultural potential.

2.2.3. Geomorphology of the site

The Douala basin is located on the edge of the Gulf of Guinea between latitudes 3°00' and 4°30' North and longitudes 9°20' and 10°20' East. It covers an area of 7,000 km² and is bordered by two sub-basins: the Kribi-Campo sub-basin in the south and the Rio Del Rey sub-basin in the north-west (Olivry, 1986).

2.2.3.1. Stratigraphy

The stratigraphy of the Douala coastal basin shows deposits of coastal sands, black mangrove muds and fluvial alluvium. These deposits have accumulated over great thicknesses in continuity with Pliocene deposits.

The sedimentary layers are monoclinical in shape and rest on a fractured Precambrian basement with a staircase structure of unequal height (PDU, 2012).

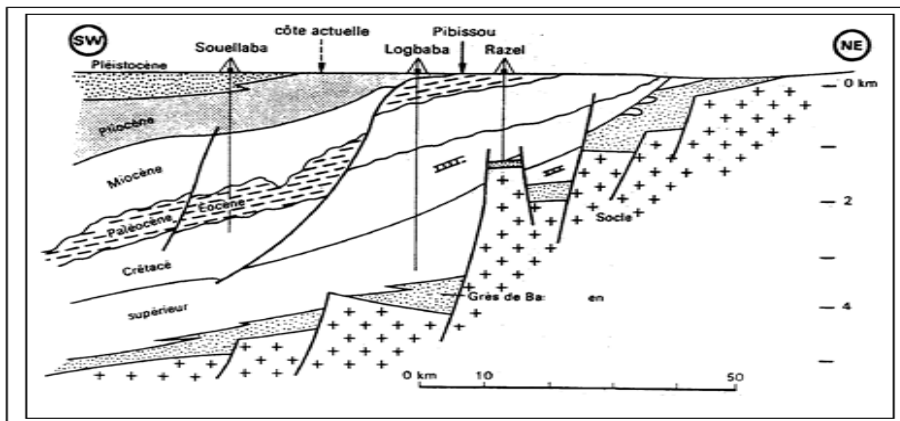


Figure 6: Structure of Douala basin (PDU, 2012)

2.2.3.2. Hydrogeological synthesis

From a hydrogeological point of view, the Douala sedimentary basin is made up of four aquifer formations of unequal importance due to their geological nature, their strength and their depth. The Douala sedimentary basin is made up of four aquifer formations that can be identified from bottom to top:

- The basic sandstones ;
- Paleocene sands;
- Mio-Pliocene sands;
- Quaternary alluvium.

The Douala sedimentary basin consists of six sedimentary formations of Albo-Aptian to Quaternary age (Olivry, 1986). These formations are presented in the form of stepped steps and are essentially composed of sand, clay and to a lesser extent gravel.

2.2.4. Hydrography

The sedimentary basin of the coastal region drains three main rivers with the following characteristics

- - The Wouri, with a NE-SW orientation and a length of 250 km;
- - The Mounjo, with a N-S orientation and a length of 150 km;
- - The Dibamba, with an E-W orientation and a length of 150 km.

With regard to the hydrographic network of the city of Douala, the Wouri is the main watercourse that drains the Douala basin. Upstream of Douala, the Wouri River drains a catchment area of 12,500 km².



Photo 1: Wouri River

It is made up of three tributaries ; Dibombe, Nkam and Makombe. These originate at altitudes of between 2,000 and 2,500m, with a very steep gradient over the first few kilometres. Over the last hundred kilometres before Douala, the slope drops to less than 0.1%. The city of Douala is also drained by numerous small streams that flow alone into the Wouri.

These are grouped into two sub-basins: the Kondi sub-basin, whose tributaries drain the northern part of the basin, and the Long Mayagui sub-basin, which waters the southern part of the basin. The values in the table below give the overall monthly distribution of freshwater inflows into the mangrove and the estuary (sinuosity of the coastline which is only covered with water at high tide) of the Wouri in billions of m³ (Olivry, 1986).

Table 1: Volume of global inputs to the Wouri estuary (Olivry, 1986)

Mois	A	M	J	J	A	S	O	N	D	J	F	M	Année
V (10^9 m^3)	1.19	1.41	2.20	3.77	5.32	6.61	5.51	2.64	1.29	0.76	0.53	0.77	32.0

Concerning groundwater, the water table in Douala is superficial. In the lower areas of Douala (Bonapriso, Nylon), the water table is 2 to 3 m deep, while in the higher areas, it is about 40 m deep.

2.2.5. Air quality

Data on **current air quality conditions in Douala** with information on the main pollutants and the levels of each. The data is presented using the standard established by the EPA Environmental Protection Agency. Main pollutant: Fine particulate matter (PM2.5). The information on the concentration of the current air pollutants is as follows: Ozone (O3 (18%)), Particulate matter **less than 2.5 microns in diameter (PM2.5 (26%))**, Particulate matter less than 10 microns in diameter (PM10 (7%)), Carbon monoxide (CO (2%)). It should be noted that the air quality data relate to the city of Douala, because no project-related activities are currently carried out on the site.

2.2.6. Noise

Noise is a vibration of the air that propagates. It can become annoying when, because of its nature, frequency or intensity, it is likely to cause excessive disturbance to people, danger, harm to health or damage to the environment. The unit of measurement for sound is the decibel (dB), which is the smallest sound pressure that can be perceived by humans. To take into account the level actually perceived by the ear, a physiological decibel called decibel A [dB(A)] is used. At present, no activities are carried out on the project site. It is therefore not possible to map the noise levels of the site.

2.2.7. Accessibility to the project site

The project site is a former warehouse of the company TRANSIMEX LOGISTICS and is located about 30 m from the national road No. 3. The road leading to the entrance of the site is therefore designed to facilitate access to the project site.



Photo 2: The entrance to the project site

2.3. Biological composition (flora and fauna) of the study area

2.3.1. Flora

The Cameroon Estuary river basins are part of the Nigeria-Cameroon-Gabon Atlantic zone, an evergreen vegetation zone. The forests found upstream of the rivers can be classified as lowland evergreen rainforest and coastal forest with *Saccoglottis gabonensis* (bidou) and *Lophira alata* (azobe).

In the floodplain of the Wouri, up to 45 km upstream of Douala, there are freshwater swamps, subject to tidal fluctuations. In places, the Wouri flows through marshy grasslands about 5 km wide, surrounded by coastal forests. The vegetation of the Wouri is characterised by alternating tropical rainforest vegetation, swamp forest vegetation and mangrove vegetation. The aquatic flora consists of water lilies and water lilies.

The forested swamp areas consist of *Oxystigma manii* (bosipi) and some *Raphia vinifera* (raffia) while the swamp meadows consist mainly of *Echinochloa pyramidalis* (borgou) and *Cyclosorus striatus* ferns and are surrounded by *Raphia hookeri* (raffia). The coastal forest on the sandy plain is characterised by the presence of *Saccoglottis* (bidou), *Lophira alata* (bongossi or azobe), *Cynometra hankei* (nkokom), *Coula* sp (ewome) and numerous trees characteristic of the Atlantic forest. The undergrowth contains *Allexis*, *Glossocalyx*, *Phyllobotryum*, and *Pierrina*.

The floristic species of the mangrove are varied and diversified. Different groups of plants are found depending on the soil category. The mangrove vegetation is grouped into 3 zones, namely

- The part of the mangrove bordering the Wouri, mainly made up of pioneer species of *Rhizophora racemosa* (red mangrove) with some *Raphia vinifera* (raffia palm) and *Avicennia nitida* (black mangrove).
- The intermediate zone, which is regularly flooded, is made up of different vegetation strata with the following structure:

- ✓ An upper stratum, composed of *Rhizophora harrisonii*, *Rhizophora mangle*, *Pandanus candelabrum*, *Raphia palma-pinus* and *Rhizophora regalis*.
- ✓ A herbaceous lower stratum, composed of *Acrostichum aureum*, *Paspalum vaginatum* and *Conocarpus erectum*
- The back zone, flooded only during very high tides, is made up of *Avicennia nitida* and *Acrostichum aureum*, which occupy the drier, landward soils, while the sector of transition to fresh water is characterised by the progressive substitution of *Rhizophora mangle*, *Pandanus* and *Raphia*. These photos below represent the mangroves.



Rhizophora harrisonii



Rhizophora regalis

Photo 3: *Rhizophora harrisonii* and *Rhizophora regalis*

2.3.2. Fauna

In the coastal zone, the following reptiles are rarely found: crocodiles (*Crocodylus cataphractus* and *C. niloticus*), monitor lizards, *Varanus niloticus*, mud turtles, and aquatic, semi-aquatic and tree snakes. Amphibians are abundant but poorly known. The aquatic fauna found in the estuary includes a number of species exploited by humans (fish, crustaceans and molluscs).

The photos below show two species from the mangrove to the banks of the Wouri.



Photo 4: Aquatic fauna

Although there are no longer any fish in the banks of the Wouri, the marine species of fish and crustaceans encountered according to fishermen in the coastal area are the genera:

Pseudolithus, Caranx, Pomadasys, Sardinella, Galeoides, Palinurus and Peneaus. The diversity of fish is very high, but the biomass of each species is low. The fish found in the estuary throughout the year are Ethmalosa, Tilapia heudeloti, Tilapia. Guineensis, Liza, Mugll, Elops, Cynoglossus as well as the juvenile stages of shrimp species of the genus Penaeus.

Table 2: Local and scientific names of some species

Scientific name	Local name
<i>Pseudolithus elongatus</i>	Bossu
<i>Pseudolithus typus</i>	Bar
<i>Palaemon hastatus</i>	Small shrimp
<i>Arius heudeloti</i>	Machoiron
<i>Galeoides decadaglus</i>	Captain
<i>Cyoglossus Spp</i>	Sole
<i>Dentex angolensis</i>	Golden head fish
<i>Lutjanus goreensis</i>	Haddock

2.4. Socio-economic and human environment

2.4.1. Demography and settlement

The city of Douala has a heterogeneous population, where not only all the ethnic groups of Cameroon cohabit, but also most of the nationals of the sub-region and even of the rest of Africa and other continents. This convergence is linked to the economic activities of this port metropolis open to the whole world. About five million people of all age groups and social conditions live here. The growth rate is said to exceed 10%. The ESSENGUE district, where the AFISA project is located, is situated in the Douala 1st district. Its population is cosmopolitan, with all of Cameroon's major ethnic groups represented. The population is cosmopolitan, and all the major ethnic groups of Cameroon are to be found there: DUALA, BASSA, EWONDO, BAFIA, BULU, BANENS, BAMILEKES, FOULBES etc.

However, the majority ethnic group is the Sawa. In addition, there are also foreigners such as Nigerians, Congolese, etc.

The traditional organisation is structured as a pyramid with a superior chief at the top of each district. The superior chief of the Douala I district is the chief of the Bell canton (His Majesty EBOUMBOU DOUALA MANGA BELL), after which come the chiefs in each village. The chief of the village or district where the project site is located is His Majesty Lobé. These chiefs as well as the superior chief are surrounded by the notables. Then come the members of the community.

2.4.2. Uses and customs

Each ethnic group maintains and practices its own customs. However, as the Sawa are in the majority in the area, the Sawa custom prevails in the habits of the inhabitants. Although each ethnic group organises its own mourning and wedding ceremonies according to its own customs, which in most cases are those of the Bantu ethnic groups.

2.4.3. Characteristics of the habitat

The buildings in the project area are of a fairly modern standard. Some areas are developed and others are not. There are two types of housing: precarious houses made of residual planks commonly called karabot and houses made of permanent materials such as cinder blocks and other cement bricks and reinforced concrete. There are also apartment buildings in the area.

2.4.4. Economic activities

Douala is the industrial city of Cameroon. Trade, industry, transport, finance and various other businesses find it a preferred environment for exchanges.

2.4.4.1. Autonomous Port of Douala

It is located some 25 km from the sea on the Wouri River. The main areas of the port and the city of Douala are located on the left bank of the Wouri. To allow ships to enter the port, an access channel is permanently dredged in the Wouri estuary. The Autonomous Port of Douala is a company that owns the first active port in Cameroon. This company is owned by the Cameroonian state. It is located in the Wouri estuary on the coastline and overlooks the Atlantic Ocean. The Port of Douala handles 95% of Cameroon's national port traffic and is the largest port in the CEMAC. It also serves the landlocked states of Chad and the Central African Republic through special agreements. As such, exports and imports from or to these countries benefit from preferential tariffs. In 2003, container activity stood at 1.2 million tonnes, or 137,624 TEU equivalent 20 feet, for a containerisation rate of 50%. In the first quarter of 2007, the autonomous port exported 520,589 tons, broken down as follows

- Cut wood: 30%;
- Timber in logs: 26%;
- Bananas: 12%; Cocoa: 8%; and
- Cocoa: 8%;
- Scrap metal: 6%;

- Cotton: 5%;
- Aluminium: 3%;
- Coffee: 2%;
- Rubber: 2%;
- Other: 6%.

In total, Cameroon exported 520,589 tonnes. This represents a year-on-year growth rate of 3%. This is very low, as exports represent only 41% of the trade balance. These photos below show the activities encountered at the port of Douala.



Photo 5 : Activities at the Autonomous Port of Douala

2.4.4.2. Other activities

In addition to the activity linked to the port of Douala, there are also industrial activities carried out by companies such as Dangoté Cement, Brasseries, UCB, and transit activities carried out by companies such as Bolloré Logistic, Maersk, GEODIS PROJECTS, TRANSIMEX etc.

Small businesses are also very present in the study area. These include stalls, drinks outlets, sand extraction units, dugout canoe manufacturing units, firewood sales points and restaurants. The motorbike taxi business is flourishing. In Essengue neighborhood, which is adjacent to the project site, there are two small markets where people buy basic necessities and many commercial establishments whose aim is to make a profit.

Some activities developed in the Douala 1 Sub-Division



Canoe manufacturing unit



Sand extraction point



Trade in firewood



Wood cuttings

Photo 6: Some economic activities carried out by the population

2.4.5. Industrial fabric around the wheat processing unit

The project site is located between two warehouses and one of the warehouses is operated by the company COCIMECAM while the other is not used. There is also another warehouse in the vicinity of the site owned by the company BATI BOIS.

2.4.6. Access to collective social services

2.4.6.1. Access to port infrastructure

The current physical state of the Port of Douala, which is satisfactory overall, is the result of successive investment programmes, one of the latest of which is the modernisation of the container terminal. On the whole, the port of Douala today offers, among others, the following possibilities

- 1000 ha of land reserve ;
- 13 sub-customs warehouses;
- 11 million tons of storage capacity;
- 02 long-term storage areas;
- 20 km of railways connected to the Transcameroon Railway, which links Douala to Ngaoundéré (North Cameroon) with a road extension to Chad and CAR;
- 20km of paved road network connected to the hinterland;
- Various facilities for specialised traffic (containers, wood, fishing, oil, fruit, etc.).

2.4.6.2. Access to health care and hospitals

Public and private health infrastructures are numerous and spread throughout the districts. There are a few hospitals (the military garrison hospital, the Muna Memorial Clinic and the Muna annex) which are a stone's throw from the project site. The Gaulle clinic, the Essengue medical and social centre and the airport clinic are also located in the project area.

2.4.6.3. Access to other infrastructures

In addition to the health infrastructure, the project area has several public and public schools, several public and private secondary schools (high schools and colleges), namely the Dogon school, the Rimballes school, the Afro-American school (Enko Bonanjo Intl School), Joss high school, Dominique Savio college, etc. We also note the presence of pharmacies (de Gaulle pharmacy, St Nicolas pharmacy and Joss pharmacy), hotels (Sawa, Rabingha, Onomo hotel, Ibis hotel and Starland hotel) and places of relaxation (Aquarius narina 2000, last colonial counter, Isiland, Douala mangroves, Gambas rustic restaurant, liner etc.), telecommunications infrastructures (CAMTEL, MTN, Orange, Nextte) and as a place of worship we have the Evangelical Church of Cameroon annexed to Essengue.

2.4.6.4. Access to drinking water and electricity

The study area is supplied with water by the CAMWATER network and with electricity by ENEO.

2.4.6.5. Waste management and sanitation

At present, the gutters in the project area, as a result of ageing and poor maintenance, have several cracks through which wastewater leaks into the ground and risks contaminating the groundwater. Furthermore, due to the misuse of equipment (introduction of non-biodegradable objects), insufficient or no cleaning, the buried pipes are blocked. This situation exposes the population not only to flooding in the event of heavy rains but also to numerous diseases whose germs are carried by this wastewater. Regarding waste management, household waste is managed by the company HYSACAM, which ensures collection and treatment. Industrial waste is managed by approved companies (BOCOM, SECA etc.).

CHAPTER III. PROJECT DESCRIPTION

The AFISA project consists of the production and operation of a wheat flour production unit with a capacity of 1000 tonnes per day. The wheat needed for the production of the flour is imported from countries such as Germany, France, Canada, Ukraine and Russia. This project will create 150 direct jobs and foster partnerships with other entrepreneurs, notably for the supply of laminated bags, which are used to package the flour. The source of electrical energy used is two generators and ENEO, but the water source used is Camwater's drinking water. The project will be carried out on a site located in the industrial zone of the autonomous port of Douala. This site covers an area of about 3 hectares.

On the site, it is planned to build :

- A warehouse with a surface area of 4,400m² ;
- Four silos with a capacity of 5,000 tons each ;
- A metal production plant ;
- Two car parks (visitors and staff);
- Offices ;
- A workshop ;
- A guardhouse, a canteen ;
- A cloakroom ;
- A water tank ;
- A drinking water pumping room ;
- A weighbridge ;
- An electrical control room.

In addition to the built infrastructure, there is also a question of greening the site by creating green spaces.

3.1. Description of the current situation of the site

In the context of our study, the planned extension area is located at a distance of about 500 m from the Wouri River. It is located in the port area of the city of Douala, which is a cosmopolitan city in expansion, with a fabric of diverse activities (industrial and human) that are developing at a steady pace. The site has a soil that is strongly influenced by the climate. As a result, there are outcrops of stagnant water throughout the site. This photo below shows the presence of extensive standing water found on the site.



Photo 7: Stagnant water found on the site

It is also colonized by human action and disappearing vegetation.

The presence of containers belonging to the TRANSIMEX company can be noted, on either side of the site, two warehouses can be observed, one of which belongs to the COCIMECAM company and the other warehouse is still unoccupied. The photo below shows some of the containers found on the site.



Photo 8: Containers present on the project site

Due to its advanced urbanisation, the site located in the port area has almost no original vegetation of the coastal region. This vegetation is usually characterized by the predominance of certain large trees such as *Saccoglottis*, *Lophira alata* and *Cynometra hankei*.

On the site, the presence of herbaceous plants such as *chromonela odorata*, fruit trees such as papaya (*carica papaya*) and some raffia plants (*Raphia vinifera*) is observed. This vegetation of the site is presented by the photo below taken on the spot.



Photo 9: Vegetation present on the site

As far as catering and relaxation facilities are concerned, there is one restaurant on the site, which is said to have a back.

3.2. Description of the planned facilities

3.2.1. Construction phase

3.2.1.1. Development works

The development works will be based on :

- Weeding, stump removal and site clearance;
- Earthworks (cut and fill);
- Levelling and compacting of the land;

This work will be carried out by both the people who will be felling the trees and the construction and public works machinery that will be doing the earthworks and cleaning up the site. This work includes the installation of the site and the general earthworks.

Installation of the site

This section includes all the preparatory work for the start of the construction of the building.

3.2.1.2. Building construction phase

The works associated with this phase are: the preparatory works stage and the actual construction stage.

3.1.1.2.1. Construction of the buildings

The buildings will be constructed according to the rules of the art of construction. These are

- The administrative building
- The factory building.

The buildings will be constructed in strict accordance with the architect's layout plan. The construction of the buildings will be carried out in two main families of work: the structural work

and the secondary work. The shell is the construction of the structural elements of the building. In this first large family of works, we find :

– **The foundations**

The ground is dug where the foundations will be laid after the building has been laid. Steel reinforcements are placed in the excavations and the concrete is poured. The combination of steel reinforcement and concrete results in a reinforced concrete foundation.

– **Masonry**

The walls are made of concrete blocks (often called breeze blocks). They are assembled with mortar (a mixture of sand, cement and water). The mortar is made with a concrete mixer. Working platforms are installed and allow the workers to work at height.

Before or after the walls are built, a reinforced concrete slab is laid on the ground floor, which can be covered with a floor covering when the work is finished.

– **The roof structure**

The roof is composed of two main parts: the framework and the roofing. The metal framework is used to support the roofing (sheets or tiles).

The finishing work is the work of fitting out the interior of the building after the walls and the framework have been erected. These works are among others :

- Plumbing work ;
- Electrical installation work ;
- Finishing work (plastering, tiling, painting, exterior plastering, etc.);
- Carpentry work (exterior and interior, installation of locks, etc.)

Installation and assembly of machinery and equipment

After construction, the following will be required

- Transport the equipment and machinery to the construction site,
- Installing the machinery and equipment,
- Test the functionality and reliability,
- Commissioning the units.

Equipment used

To ensure the operation of the facilities and the production of wheat flour, the mill will use as equipment

- Two generators with a capacity of 1000 KA each ;
- A boiler :
- 04 silos (5000 tons per silo) made of galvanized steel sheets ;

- Silos (100 tons per silo)
- Electrical installations (transformer stations, cables, electrical cabinets etc.)
- Water installations (a water tank and a hydraulic pump)
- Two lines of mills (500t per mill) consisting of roller mills and stainless steel rollers
- Bagging machines ;
- Service and delivery vehicles ;


Conical bottom silos

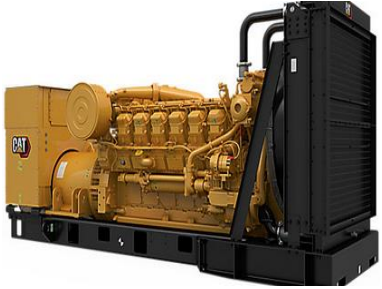





It is generally smaller in diameter than flat-bottomed silos and has a maximum height of 12 metres and a capacity of 3450 cubic metres. The conical bottom silo is assigned to many industrial applications. It allows the storage of fragile products, which can be affected in an unloading process. This type of silo requires a special construction. The bottom is constructed differently from the flat-bottomed silo, in order to reduce its weight, which allows the bottom to be raised above the ground. In this way, the stored product is isolated from the ground, which prevents moisture from entering and preserves the product. The emphasis is also on ventilation. It is used in this project for the storage of wheat grains.

Mills

A mill is a machine for grinding, originally with one or more millstones, mainly harvested cereal grains into a more or less coarse powder or flour. The grinding is done by a crushing and friction action: it opens the grain and scrapes the husk. The slapper, another cylinder device, reduces the semolina to flour. The crushed grains are thus transformed into coarse flour, which is expelled, by centrifugal force, outside the millstones, directly onto the floor.

Table 3: Equipment used

Name/brand	Characteristic	models
Food storage silos	Conical shape Height: 5-12 m Volume: 3650 m ³ Mass : 5000 tons	

Generators	<p>Type: CAT Power: 1000 kVa Rotation speed 1500 rpm Tank capacity 1000 Liters Frequency: 50 Hz Optional automatic start Low fuel consumption</p>	
Hydraulic pump	<p>Flygt brand Q: 25 m³/h H: 37 mCE</p>	
water tank	<p>Raised tanks Made of reinforced concrete Pump-fed Thickness of the water level 3-6 m Height 2 - 3m</p>	
bagging machines	<p>Capacity: 25- 50 Kg Self-closing bag clamps Very strong welded frame in epoxy painted steel All parts in contact with the product are in stainless steel</p>	
Mill	<p>Grinder for whole wheat flour 400 kg/h coarse and 250 kg/h fine Throughput : 50 to 400 kg/h</p>	
Principle of the optical sorter	<p>Annual volume: 30 t/year Operation: 4 black and white cameras detect the seeds to be 72 blowers remove unwanted seeds Equipped with dust and oil separator, dehumidifier and antibacterial filter</p>	

After the project engineering phase and the actual installation of all the infrastructure (access

roads, tracks, various networks, water, electricity, telecommunications, buildings, etc.), ancillary equipment and personnel, the various objectives pursued by AFISA will be implemented through the services provided during the operating phase.

3.2.2. Operation phase

- The operation of the built infrastructure will function as a group of diversified services oriented towards

- Wheat flour production
- Handling and logistics ;
- Transport of products by truck
- Storage and warehousing ;
- Loading ;

To do this, AFISA has :

- Land transport equipment (trucks);
- A fleet of lorries with various equipment and tools necessary for the activity of several trades (mechanics, pneumatic, lubrication, etc.)
- Warehouses for the storage of food products.

The figure below shows these activities in the best possible light.

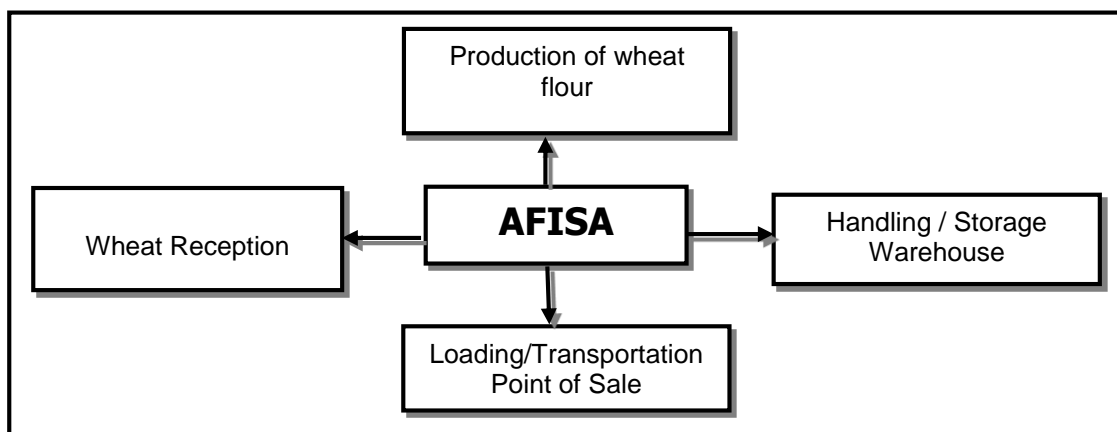


Figure 7: Different activities carried out during operation

The process used by AFISA takes up the traditional methods of preserving, through sophisticated means, the culture and history of wheat milling. This process is based on the following phases :

3.2.1.1. Reception of raw materials

The raw material is received by road using bulk lorries, and the quantity of wheat is checked on a weighbridge with a capacity of 80 tonnes located at the entrance to the mill. The wheat is received in several stages.

These stages are as follows :

- The unloading of the wheat received at the port into trucks, using two different methods, namely unloading by crane and by suction.
- The arrival of the durum wheat at the mills,
- Weighing of the wheat, the trucks pass through the weighbridge where the quantity received is weighed and then poured into a 100T/h reception hopper. The latter is covered by a 25 mm steel grid located between the mill and the storage silos to retain large impurities such as stones, wood, straw, etc. The hopper is protected by a roof against the weather and is able to accommodate a full 30 tonne truck.
- The wheat is transported to the storage silos by means of conveyors and bucket lifts. The lifts (mechanical conveyors), transport the wheat to the pre-cleaning section, then it either goes to the storage silos with a capacity of 10,000 quintals x 8 or to the mixing cells.

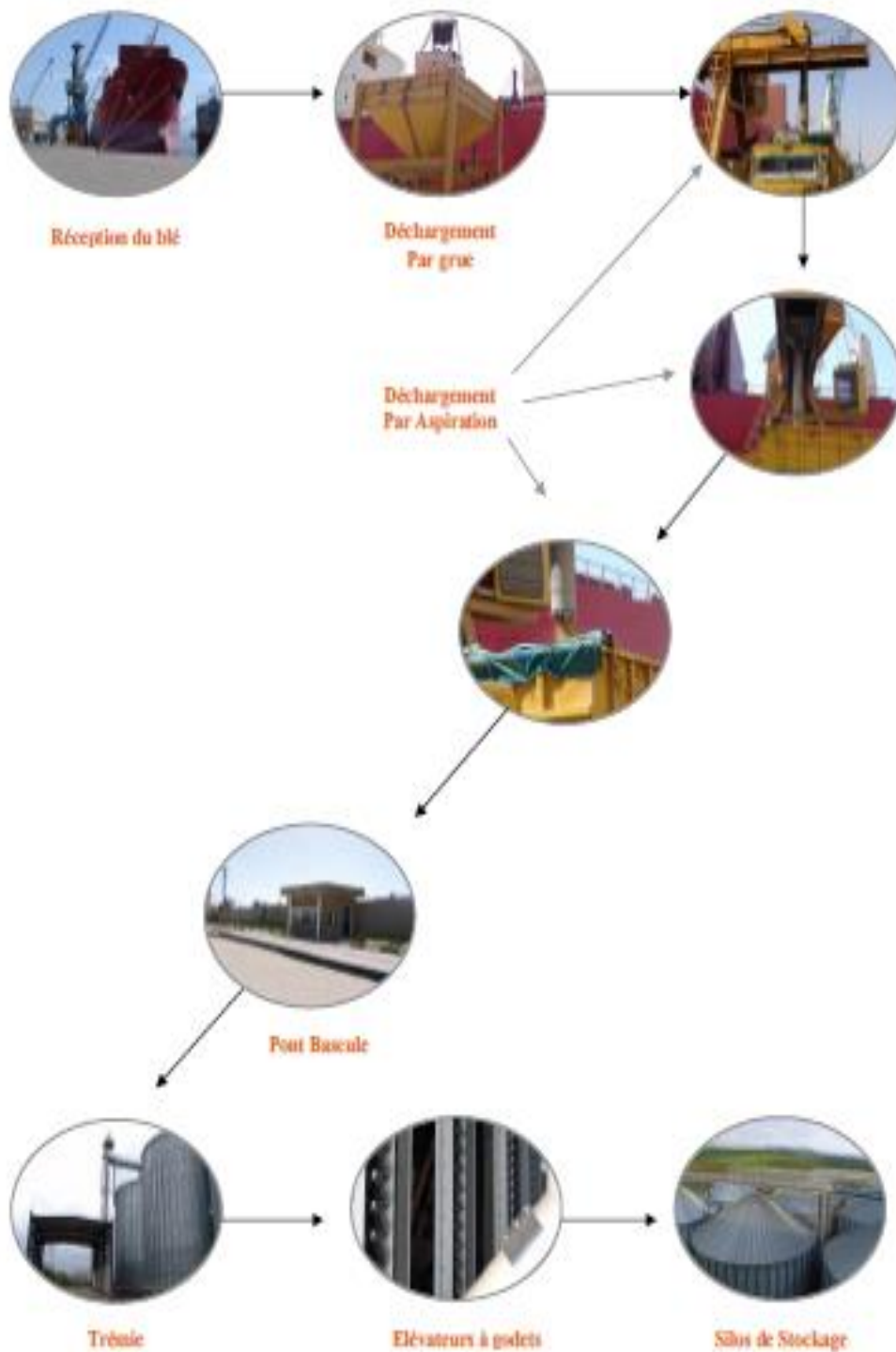


Figure 8: Different stages of wheat reception

3.2.1.2. Pre-cleaning

Pre-cleaning has an important role to play in the preservation of the grain. The purpose of this operation is to eliminate large impurities and some of the dust and fine waste in the wheat received. This stage is very important for the preparation of wheat for cleaning, it includes the following equipment

- A receiving hopper that removes the large waste, with a chain conveyor linked by a bucket lift ;

- A magnetic separator ;
- Two separator-cleaners, hoovers.

After unloading in the reception hopper, the wheat is taken over by a chain conveyor, which takes it to the bucket lift, then the wheat deviates to the distributor, which distributes the wheat to the waiting cells or directly to the pre-cleaning operation. The wheat in the pre-cleaning stage passes through several equipments :

3.2.1.3. Magnetic separator

Also known as a magnet, it has a very simple role: it eliminates the particles and ferrous elements that may be present in the wheat. It is placed at the head of the cleaning circuit to avoid and limit the risks and damage that can be caused by sparks in an atmosphere full of dust, thus limiting the risks of explosions.

The magnetic separator is also placed before the arrival of the wheat at the first mill to ensure the elimination of ferrous particles from the wheat during the milling process.

After this equipment, the wheat is distributed to two cleaning-aspirator separators.

3.2.1.4. Separator-cleaner-aspirator (S.N.A)

After the magnet, the wheat goes to the two separators that carry out the cleaning operation, which have a capacity of 50 T/h. The cleaning-aspirator separator is described as follows

- Product inlet: an iron pipe fixed directly to the frame by a frame is connected to the piping with a ring to the sieve holder by means of a flexible rubber sleeve.
- Distribution device : its role is to distribute the product uniformly along the entire length of the sieve.
- Sieve holder frame: it is provided with an oscillating movement, imparted by the camshaft, the counterweights ensure the stability of the machine containing the guides for the alignment of the product collection sieves.
- Sieves: there are two types:
 - An upper sieve with large perforations of about 6 mm in diameter, obliquely shaped, the sieve allows the wheat to pass through and rejects the large waste.
 - A lower sieve with small perforations of about 2 mm, it rejects the wheat and lets fine waste such as sand pass through... etc.
- Separation chamber: it is divided into channels for an efficient cleaning of the product along the length of the machine, it is used to clean thanks to the suction at this level.

There are three types of waste :

- Light waste is sucked up and removed by suction ;
- Coarse waste and sand removed by sieves ;
- Ferrous waste eliminated by the magnet.

After the wheat has passed through the two separator-cleaner-aspirator the next equipment is the tarare :

3.2.1.5. Tarare

This is a piece of equipment that is inserted in the pre-cleaning section as well as in the cleaning section, and is used to eliminate the lightest impurities such as wheat. The product is introduced into a vibrating drawer at the lower rear part of the machine. The air flow adjustment is very important in order to be sure to remove a maximum of impurities which are collected in the internal chamber of the machine and precipitated and then extracted with the help of a screw.

In this section, after the pre-cleaning operation, the wheat is taken back by means of the solenoid valves above and below either to the silos and mixing cells or to the first cleaning and conditioning section

3.2.1.6. Cleaning process

During the pre-cleaning operation, separations are rather superficial, aiming mainly at removing the bulk of dust and impurities, even after this operation the wheat still contains impurities. The grain may also be contaminated by insects or rodent excrement. The grains are covered with dust and dirt, and the percentage of impurities is normally between 1 and 3%. This is why the first cleaning and conditioning stage is necessary.

The first cleaning starts from the dosing extractors of the dirty wheat mixing cells. Leaving the mixing cells, the wheat is transported by an auger to the bucket lift which transports it to the fourth floor, then it falls into an auger which is conveyed to a magnet in order to eliminate metallic waste, the wheat is weighed by a 10T/h scale. Once the wheat is weighed, it passes through the separator cleaner aspirator which is combined with a suction channel.

The raw material then passes through a de-stoner, a brush de-stoner and a suction channel. With the help of a lift the good wheat is transported to the automatic humidifier and continues its way to the wetting screw (inclined) with two solenoid valves the wheat is distributed to three first conditioning cells for a resting time of 24 hours. For this stage (first cleaning and first conditioning) a set of equipment is provided.

3.2.1.7. Magnetic separator

This is a machine that fits into the wheat cleaning diagram, its function is to eliminate and retain metal pieces (washers, screws, nails, etc.), with the aim of avoiding machine breakages or even explosions.

In fact, a ferrous body that passes through the machines can overheat and, in contact with the dust/sound/germ of the grain, can cause an explosion.

The separation of these materials is done by magnet separators which are placed at different points in the cleaning section: in particular, immediately after the check weigher, before the grain cleaners, and before the grain is sent to the mill.

3.2.1.8. Cleaning and suction separator

This equipment works on the principle of sieving, exploiting the phenomenon of differences in particle size, which consists of separating impurities whose size is smaller (sand, plant parasites, plants, fodder cereals) and larger (different cereals, beans, straw, coarse impurities, etc.) than that of the wheat grain.

This device consists of two slightly inclined sieves with a back and forth movement, completed by a strong suction to remove bubbles, dust and other light impurities.

- The main sieve: whose mesh openings are 6 mm in diameter, allowing the wheat to pass through and rejecting waste larger than wheat.
- The sand sieve: with a mesh size of 2 mm in diameter, it allows fine impurities to pass through and rejects wheat.

3.2.1.9. Stoner

This is a piece of equipment that serves to continuously separate stones and materials whose shape and dimensions may be those of wheat but which are of a different specific weight. It is a completely closed machine working in depression (the pressure of the de-stoner is lower than the atmospheric pressure). It is essentially made up of a metal construction and an inclined work surface, which is composed of a frame on which a sorting plate made of metal fabric with interchangeable serial meshes is fixed.

Due to the oscillating movement and the air flow sucked in by the fan, which reaches the plate through the suction channel on the suction hood, the air flow passes through the product from the bottom to the top; the light fraction is thus on the top and the heavy impurities are on the bottom (contact with the sieve). The lower layer, where the stones are also located, flows upwards, the de-stoned product is carried by air cushions slowly to the product outlet at the bottom.

The adjustment of this machine is done as follows:

- The frequency of the vibrations and their amplitudes must be adjusted;
- The perforations of the frame plate must be selected;
- The suspension effect of the air flowing through the wheat must be adjusted;
- The inclination of the working surfaces must be adjusted.

3.2.1.10. Sorting battery

These are sorters with a honeycomb jacket, whose job is to exploit differences in shape and size. They are made of a cylindrical steel sheet with cells on its inner surface.

- Round grain sorter (TGR): worked with 5.5 mm cells, its role is to extract round grains and refuse wheat grains and long grains;
- Long grain sorter (TGL): worked with alveoli of about 10 mm, the role of the TGL is to extract the wheat and refuse the long grains;
- Round grain sorter: it is fed by the round grains extracted from the TGR, the role of the latter is to separate the wheat assembled with the round grains.

3.2.1.11. Brush hulling

After the sorting stage, the wheat undergoes the brushing (scrubbing) treatment, the purpose of which is to remove and loosen the soil and dust that may adhere to the surface of the wheat. It also removes the wheat's beard and infesting grains. It also ensures the cleaning of the furrow. This machine is of all-metal construction and is divided into two horizontally arranged parts and includes a beater rotor with rotary motion.

3.2.1.12. Suction channel

The purpose of this machine is to separate grain, husk particles and light impurities. It consists of the following main components :

- A feeder with a longitudinal vibrating motor (feed box);
- Adjustable rear walls ;
- In the suction channel, the feeder consists of a box with a freely oscillating feeder shoe, which is suspended on rubber blocks (to avoid friction) and springs (to adjust the height between the shoes).
- The vibrator motor drives the shoe and makes it vibrate horizontally, simultaneously and subsequently to the product weight. The discharge head opens sufficiently to obtain an even veil of product coming out horizontally over the whole width of the channel.
- The handwheel adjusts the air flow and controls the movement of the upper part of the back wall and another handwheel controls the lower part of the back wall.

3.2.1.13. Conditioning steps

After the wheat has been freed from a high proportion of impurities, it is transported by lift to the automatic humidifier and then to the (inclined) wetting screw for a further step, which is conditioning.

The term conditioning commonly means a treatment of the grain by a combination of moisture plus resting time of the wet grain. The purpose of which is to modify their physical characteristics and to facilitate their reduction to flour as well as to allow the mechanical operations of the mill to be as efficient as possible.

The purpose of conditioning is therefore to

- To soften the husks so that they do not break into fine particles during the grinding phase ;
- To soften the kernel so that it breaks up during the grinding process ;
- Facilitate the separation of the shells thanks to the rapid diffusion of water ;
- To reduce energy expenditure as dry milled wheat consumes very high energy ;
- To obtain a good quality finished product ;

The addition of water is done in an automatic humidifier which ensures the good distribution of water in a batch of wheat then it passes in a wetting screw whose purpose is to continue the humidification operation.

Conditioning is done in two stages :

First conditioning and then resting in the three cells for 24 hours, the quality of water needed for the wheat depends on its nature and initial humidity as well as the humidity of the desired flour. This is why we use the automatic drier where it is enough to check the time calibration, then a damping screw. At this point, 2/3 of the quantity of water is added using the following formula:

$$X = Q (H_f - H_i) / (100 H_f)$$

X : the quantity of water added / weighed;

H_f: final moisture content;

H_i: initial moisture;

Q : wheat flow in kg/h to be conditioned

Second conditioning then resting in the two cells for 12 hours, in this stage with the help of the dosers which are at the level of the cells of the first conditioning. The wheat is transported to another wetting screw by an auger and a bucket lift in order to add 1/3 of water and then the wheat is transported to the rest cells.

3.2.1.14. Second cleaning

The second cleaning is done by two machines :

A brush : the product enters through the inlet port or is immediately in contact with the rotor beaters that start to agitate it and drag it towards the outlet during the whole journey, the product undergoes a beating action caused by the beaters. A rubbing action in contact with the mantle collects all the waste passed through the mantle itself.

An optical sorter : Principle of optical sorting

1. Loading hopper
2. Vibrating feeder plate
3. Inclined chute
4. Full colour RGB camera

5. Additional NIR and/or InGaAs cameras
6. Ejectors
7. Compliant product discharge hopper
8. Waste discharge hopper.

3.2.1.15. Soft wheat milling sections

General

The conditioned wheat is transported to the first pair of milling rollers where the gradual separation of the kernel from the husks begins.

The purpose of milling is to open the grain, to detach as much of the albumen as possible from the wheat kernel shell and to gradually reduce the practically pure kernel to a finished product.

Wheat milling can be summarized in two phases:

- Separating the floury kernel from the bran and germ, this phase is carried out during grinding
- Reducing this kernel to a fine granule that can be classified as flour that meets the standards and needs of consumers, this phase is carried out during the converting and cracking process.

The milling operation is carried out by a series of equipment, each of which has a specific role, such as: cylinder mills for milling, crushing and converting, and planichters for separating the different products according to their size. The sasseurs for the separation of the different products according to their densities.

Where the effect of these equipments is completed by detachers and bran brushes. The milling of soft wheat allows the extraction of the flour and the products.

3.1.2.15.1. Main milling operations

This phase is the most important in the milling process because it directly influences the quality and yield of the finished product. It consists of detaching the endosperm from the husk in the form of a large particle, avoiding breaking the bran.

The aim of this phase is :

- Fragment the wheat grain to facilitate extraction of the kernel ;
- To achieve the best separation between the kernel and the husks ;

Blasting

This operation is carried out by means of sieves placed in the planichter compartments. Its purpose is to classify the products coming from the crushing, converting and reducing machines according to the dimensions of the different particles, and it is carried out on a moving sieving surface.

Drying

This is also done with the help of planichter compartments with superimposed sieves. It is an operation that consists of completing the sifting and completely eliminating the flour that is mixed with the fine and final semolina. The extraction consists of the flour. While the reject is sent to the sifters.

Characteristics of the plansifter

The plansifter is essentially a series of sieves which are arranged in compartments 3 to 4, each of which can contain 26 or even 27 sieves. In Molinos-Granit we have 3 compartments with 26 sieves, the sieving action is exerted by a rotating movement parallel to the ground.

Sieving

This is an operation that serves in particular to classify the grits according to their density, so it is the intermediary between the crushing and the first phase of reduction of the slag products.

Characteristics of a mill

It is a piece of equipment whose function is to classify the grinding particles according to their density and granulation, which allows for increased extraction of flour with a low ash content. There are two factors that influence this operation : suction and the movement of the sieves.

Disaggregation

This is carried out with finely fluted rollers, the aim of which is to free as much of the floury kernel adhering to the fragments of the husks as possible and to obtain the maximum amount of pure flour. In fact, it is an operation that completes the milling process, which runs parallel to it.

Cracking

This operation is carried out on machines with smooth cylinders followed by detachers. It is used to progressively reduce the products of the grinding and sifting process into fine particles, thus producing very clean grains that are transformed into flour during the conversion process, while the rejects from the clacking process constitute the remoulding process.

Converting

It is the final operation of the reduction which consists in reducing the grains and the finely ground and crushed particles in order to extract the maximum amount of flour, its quality and quantity depend a lot on the perfection of this process because the greatest quantity of flour extracted in the milling is done in the conversion phase, about 40 to 45%. The conversion is done with the help of the smooth cylinders followed by the detachers.

Bran cleaning

This is an operation that consists of reducing as much as possible the quantity of kernels adhering to the inside of the husks. It is carried out by bran brushes that are fed by the head reject of the last mills.

1) The bran brush

It is incorporated in the milling diagram, it is used to clean the bran or the adherent envelopes of the flour particles, this machine is positioned in the milling line at the exit of the planisher, its operation is as follows: the product arrives at the top level of the machine and then, with the help of a screw, it is taken to a centrifugal disc which distributes the product over the periphery. It also serves to slow down the arrival and allows a homogeneous distribution of the product in the working space, the product advances thanks to beaters fixed on the axis which project the product against the mantle which separates the flour from the bran by the shock.

2) The vibratory finisher

Its purpose is to treat the product coming from the filter and the bran brushes to extract the flour, its operating principle is similar to that of the bran brush with a change concerning :

- The dimensions of the perforations ;
- The design of the machine ;
- The nature of the product entering the equipment.

C3) The filter

It filters and recovers the fine particles carried in suspension by the pneumatic transport air or by the air from the suction systems.

It is practically used in a suction system or in a delivery system, its operating principle is based on two phases :

- The filtering phase : at this stage the dusty air enters at the bottom of the filter and is distributed around the filter bags, the light particles (flour, dust, etc.) remain stuck to the surface of the bag. On the other hand, the light and heavy particles fall into a discharge hopper at the bottom. The purified filtered air exits at the top to the purified air chamber and is then discharged into the atmosphere.
- The degumming phase: where the cleaning air arrives in a compressed air tank fed by a compressor, it creates a higher pressure in the sleeves than the one outside, the effect of the higher internal pressure is to :
 - Cause a radical cushioning of the sleeve ;
 - Passing clean air through the filter bag by loosening the light particles, which are accumulated on the outside and which fall at the filter outlet by passing through a lock that prevents the air from reaching it.

Flour safety stage

This stage is carried out by a small plansifter called a safety plansifter, which serves to remove foreign particles, which can be found in the flour mass after storage, such as metallic elements that can be released by milling equipment or certain coarse particles during the wear of the flour sieves as well as the recovery of certain insect fragments.

3.1.2.15.2. Nature of the milling products

Flour: This consists of very fine wheat kernel particles resulting from its reduction

Bread flour: which is designated for bread making;

Superior flour: which is used in biscuit making, etc.

Finots and grains : they come from different passages of rollers, they are similar dressed products,

Issues: represent the particles and fragments of the envelopes of the grains, they are distinguished from the grains by the sounds and the remouldings;

Bran: consists of the envelopes of the grain, there are two kinds of bran: coarse bran and fine bran;

Remoulding: these are mixtures of more or less finely ground envelopes, there are: white remoulding and bis remoulding.

3.1.2.15.3. Silage

The wholemeal flour is a mixture of the flours that come from grinding, slaking and converting, the various flours are led to the so-called flour chambers.

3.1.2.15.4. Maturation of the flours

Maturation is a term that encompasses the succession of a phenomenon that allows a physical or biological system to reach a complete development, for the flours it is about the various transformations that will bring them but not to their qualitative optimum at least to a level such that their use will not pose any particular problem to the users.

3.1.2.15.5. Bagging

At the end of the milling cycle, the finished product is stored in flour chambers with a capacity of 240 tonnes. At their exit, the finished product passes through scales of different weights : 1kg, 5kg, 25kg for the higher kevel flours. 25kg, 50kg for bread flours.



Figure 9: Finished products (25 kg and 50 kg bags of flour)

Storage of finished products

Flour storage: after the bagging operation, the product is either stored in a large capacity 150 ton shed, or it is transported directly to the various sales outlets or is transported by trucks to the unit's customers.

Bran storage : the bran produced is a finished product other than flour, such as fine bran and coarse bran, remoulded, mixed in pipes and transported to bran chambers, extracted from the storage cells and loaded into trucks.

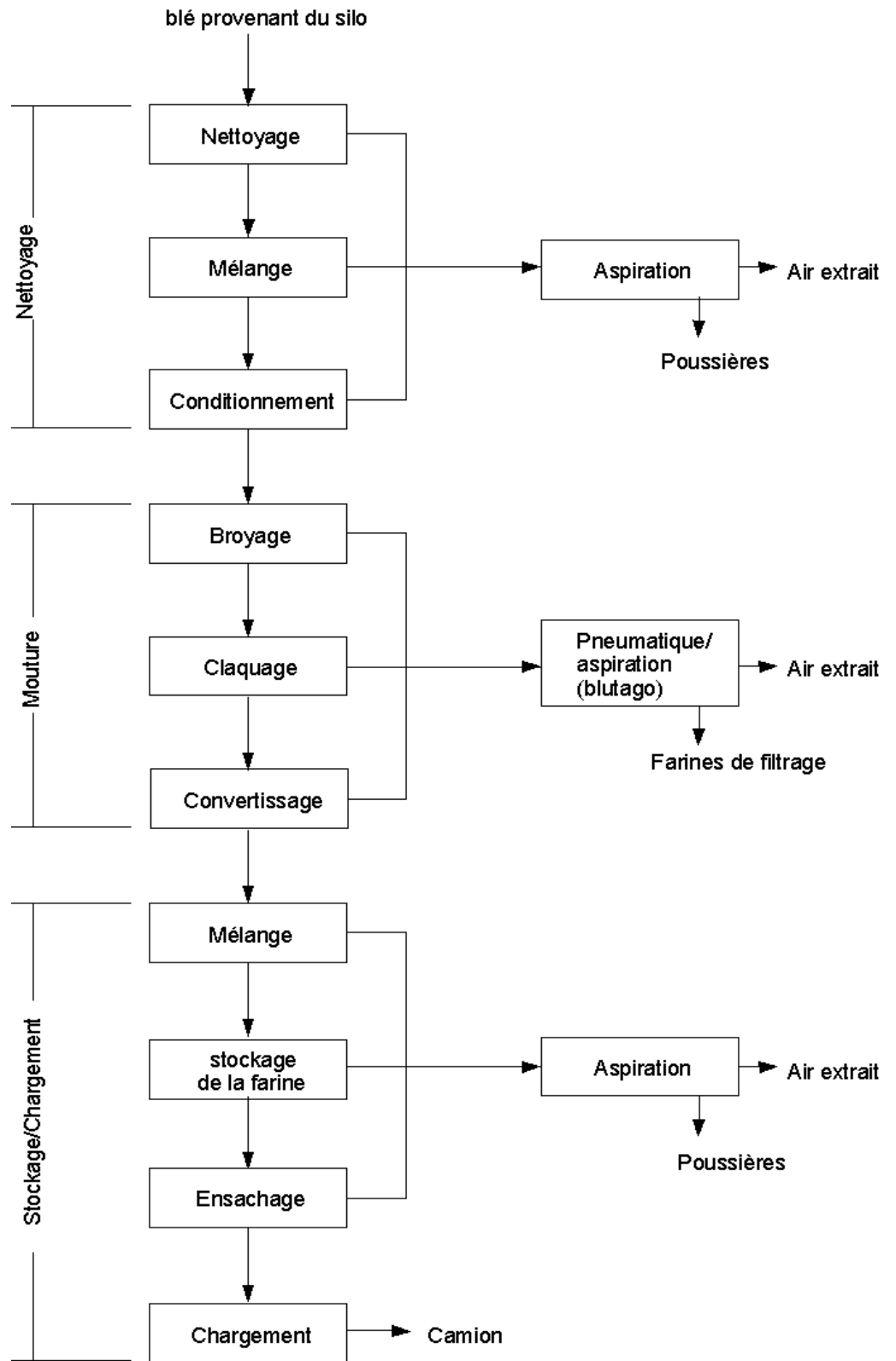


Figure 10: Operating diagram of a wheat mill

3.2.3. Abandonment and closure phase

In case of abandonment of the project or closure of the facilities by the promoter, the following actions will be considered

- Administrative formalities ;
- Dismantling and transporting the equipment
- Liquidation of assets ;
- Transfer to a third party or takeover by another operator on the site;
- Restoration of the site (general clean-up);
- -Stopping the semolina production activities.

CHAPTER IV. REPORT OF THE FIELD MISSION

In accordance with the provisions of Decree No. 2013/0171 / PM of 14 February 2013 setting out the modalities for carrying out the Environmental and Social Impact Assessment, the study of the project to build and operate a flour mill was marked by a field mission phase, which enabled the involvement of the various stakeholders, most especially the people of the Essengue village.

In the framework of collective and individual meetings, the study team had the opportunity to review with the people concerned, the tangible negative and positive impacts of the environmental components of the project and the measures that will be implemented to control the negative impacts.

These meetings enabled the people concerned to gain a better understanding of the activities of the planned project and its impacts, to express their concerns and expectations regarding the project. They also made it possible to gather relevant data on the environment (human, socio-economic, physical, biological, etc.) to be taken into account in the study and to consider, with the participants, corrective or compensatory measures adapted to the local context.

The objective is to

- Complete the identification of the project's impacts with the stakeholders;
- To involve interested parties in the study work;
- Gather relevant information to be taken into account in the conduct of the study.

This consisted of information gathering meetings and consultations with administrative and traditional authorities and local people. This section of the report presents the process and results of the consultation.

4.1. Surveys and data collection

Site visit, had to do with collecting relevant information from resource persons (Council,, Divisional delegates,Paramount chief, village chiefs local populations) on the following data:

Physical characteristics ;

Characteristics of the activity;

Map and plan of the study area;

Recognition of the surrounding environment (population, etc.);

Regulatory texts and constraints;

Social components of the area.

4.2. Results of the field visits

4.2.1. Preparatory meetings for the meeting with the populations

As part of the preparatory phase of the public consultations, six visits were made with the following objectives - The second stage was devoted to raising awareness and providing information about the project through meetings and exchanges with the stakeholders, followed by the submission of descriptive memos and letters dated 19 and 25 August 2021 for the sectoral representatives, the mayor's office and the village chief, and from the 20, 21 and 25 October 2021 for the paramount chief through his permanent secretariat.

The date and place of the individual and collective (public) consultations were communicated to all parties. They took places along side the different sectoral groups from 6 to 10 September 2021 and on the 29 October with the local population, the elites, the village chief and their notability.

4.2.2. Individual Meeting and Public Consultation

Individual meetings of stakeholders in Douala

From September 06 to 10, 2021, BET experts made a field trip, the objective of which was to collect the opinions of sectors and some authorities. Equipped with an opinion collection sheet, the experts visited the various offices of the administrations concerned, met the departmental delegates and collected the sheets on which the opinions issued are recorded (see appendix).

Public consultation

On the 29 October 2021, the public consultation on the Environmental and Social Impact Assessment of the project to build and operate a flour mill was held at the Bell paramount chiefdom. The attendance list attached to the report and minutes of this meeting are evocative.

The agenda included

- Welcome address;
- Presentation of the legal framework for ESIA;
- Presentation of the project;
- Presentation of the project and its activities;
- Presentation of the study work and environmental aspects;
- Intervention of participants (questions and answers);
- Summary of interventions ;
- Closing

The consultation meeting began at 1.50 p.m. with the opening words of the head of the family, Mr DINA BEBE, who welcomed all the participants, followed by a short prayer. A moderator was appointed in the person of Mr NDOUMBE BOLANGA to lead the proceedings. The latter immediately took the floor and unfolded the above agenda. At the outset, he gave the floor to the designated office for a word. BET welcomed all the participants and presented the purpose of the day's meeting while apologizing for the delay in starting the work.

After these words, the presentation of the legal framework was given by BET. Taking the floor, Mr. KABEYENE highlighted the legal texts elaborated on this subject. He first mentioned the preamble of the constitution which gives the right to every citizen to have a healthy environment. Cameroon has adopted the regulations governing environmental management, the 96 framework law whose article 17 recommends the carrying out of an Environmental and Social Impact study for any development project, equipment or installation before its implementation in order to assess the direct and indirect impacts on the natural environment and article 72 which speaks of the participation of the population, the implementation decree No 2013/0170/PM of 14 February 2013 setting the modalities for carrying out Environmental Impact studies and order 00001/2016 of 08 February 2016 setting the different categories of operations whose implementation is subject to an Environmental and Social impact study. There are different types of studies according to the regulation, namely ESIA, EIESS, ESA and NIE.

Following the legal framework, the project was described by Mr. BELL MAHOUBE, HSE Manager, of AFISA FOOD Industry S.A. company According to him, AFISA is a subsidiary of the GROUP TRANS AFRICA GENERAL TRADING specialized in the production of wheat flour. Created in 2015, AFISA currently has two production plants located in the Littoral and Adamaoua regions, precisely in Douala and Ngaoundéré. AFISA's mission is to continuously create value and contribute to the well-being of the population by providing them with a wide range of high quality wheat flour that meets the industrial standards in force. To achieve this, AFISA aims to increase its production capacity by building a large factory to meet this need. The wheat used mainly at AFISA is imported and comes from European countries and Russia. There are two types of wheat, namely soft wheat and sweet wheat, which have high proportions of nutritional value. Imported wheat arrives by ship and is stored in silos and warehouses. This wheat is then cleaned to remove impurities before milling, and the processed wheat is packaged. The company works in close collaboration with MINSANTÉ and MINCOMMERCE, which monitor the grain to ensure that the nutritional values of the wheat and food standards are respected. Flour produced is used to make bread, doughnuts and pasta. The various products on the market resulting from wheat processing (Mama makala, Baker's Choice, Africana, Primo.). As the project is an industrial unit, it also needs an authorization to set up and operate.

Since a development project cannot be carried out without secondary effects on the surrounding environment, the impacts presented below should be considered: GES CONSULTING's presentation of the project's activities, which are divided into three phases:

- Development phase (site installation, weed control, traffic intensity, dust emissions, development).

- Construction phase: (noise, risk of accidents and incidents, gas emissions, construction waste, mixing of populations, risk of conflict, management of plastic waste by approved structures, job creation),
- Operation/production phase (increase in the tax base, supply of the local market, risk of equipment malfunction).

Mr BOLLANGA NDOUMBE, the moderator of the meeting, took the floor and invited participants to ask useful and important questions and not to dwell on what does not build. Participants' questions and concerns centred on the following points:

- Why is the public consultation held before the project is carried out and not after?
- Need for frank collaboration with AFISA, recruitment of competent people, favouring and training local labour for the engineering work.
- The packaging and weight of the flour?
- Where will the waste from the dehulling of the wheat be deposited?
- Need for more concrete assurances regarding the recruitment of local people;
- The absence of administrative representatives at the meeting.
- Populations' attribution of value to the chiefdom. Did you come with the agreement of the PAD or the chiefdom?
- Need the recruitment company be national to respect sociological components;
- The 1996 framework law defines the axes of the ESIA: at what level is the ESIA situated?
- Does the company have a corporate social responsibility component?
- The materialization and formalization of a platform between AFISA and the community
- As the role of the architect is to design the plans and not to carry out the construction work, what is the contribution of local architects to this project?
- Has AFISA planned any social actions that could benefit the village due to its installation ?

The following answers were given

- The legislator did not provide for public consultation after the ESIA has been carried out. The consultation takes place before as it is an integral part of the ESIA report. The public consultation aims to inform, collect relevant information to be taken into account in the conduct of the ESIA and to complete the identification of the impacts of the company's activities on the environmental and social components; this work must be done in community.
- With regard to the recruitment of local labour, this is a fundamental concern; the legislator has provided for this in texts. There are categories of workers, from workers to engineers. The positions to be filled will be posted at the chiefdom where they can be consulted by local residents. Local residents should also take advantage of the tools made available to them in order to track down the companies established in their area. From construction to operation, the activities will follow one another and recruitment will be based on demand.
- Packaging will be done in bags of 50kgs, 25kgs and 5kgs.
- The activity itself does not produce any waste as such. The husk from the wheat is sold as bran to feed sellers. As for waste water, there is not really any. Office waste is collected by the HYSACAM company for processing against a receipt of traceability (manifest).
- Depending on the situation and the context that arises, several consultation approaches can be used provided that stakeholders are consulted.
- The ESIA is in its preliminary phase, which is why we are consulting stakeholders
- AFISA integrates the sociological component in the recruitment of its workforce;
- The populations are called upon to define their own concerns through their chief, it is necessary to work in close collaboration with the village chief;
- For the construction of such a project, the applicant architect is often required to have a background of experience;
- AFISA is a privately owned company and provides as much social assistance as possible while taking precautions to avoid exposure.
- There is no position for a corporate social relation, the company is national and does some work on behalf of the communities, for this to happen there must be the community leaders (chiefs) must be dynamic

The populations expressed some grievances, namely

- Recruitment of local residents;

- Creation of a platform for open collaboration between the company and the community;
- Posting of vacancies at the chiefdom
- Assistance with existing infrastructure and social works

The discussion session were concluded by NDOUMBE BOLLANGA who handed over to BET for the final word. An appreciative word was given to the participants for their presence and active participation in the work.

Number of participants: 35 people

4.3. Summary of opinions collected

The opinions of the resource persons interviewed are set out in the following table.

Table 4 : Summary of the opinions of resource persons

Function / phone	Function / phone	Observations / summary
TONYE Lavoisier	Sworn Communal Staff of Doual I Council 671 324 096	Relevant socio-economic project that integrates the components. Promote access to employment for the local population, contribute to the improvement of basic social services, protect the immediate environment and contribute to the expansion of the commune's tax base
SOSSO Aurélie Ep. MANGAGUEMABE	Divisional Delegate of trade 655 080 887	Project of proven importance in terms of food needs. The fear is that the tension between the decision-makers and AFISA in relation to the price to be paid by households may be accentuated ; Consideration should be given to preserving the peace and quiet not only of local residents but also of employees in terms of dust and noise pollution. Consider in the near future the substitution of imported raw materials by our local products. Consideration should be given to preserving the peace and quiet not only of local residents but also of employees in terms of dust and noise pollution. Consider in the near future the substitution of imported raw materials by our local products.
TCHAPTCHET Epse EKANGO	DD MINMIDT Wouri	Quality project that will certainly reduce the unemployment rate Take into account the specific safety measures corresponding to the immediate environment.

		<p>To have an authorization to set up and operate</p> <p>Have a hazard study and an emergency plan</p> <p>Implement all recommended safety measures</p>
<p>EWOMBE KALLA Ep ATANGANA</p>	<p>Regional Labour and Social Security Inspector No. 5</p>	<p>Project with potential for job creation</p> <p>Project presenting risks that could affect health; fear of a lack of respect for labour rules and social security conditions.</p> <p>Registering staff with the CNPS</p> <p>Obtaining the mandatory legal documents on labour matters</p> <p>Have a functional CHS immediately after opening</p> <p>Collaborate with the MINTSS for support.</p>

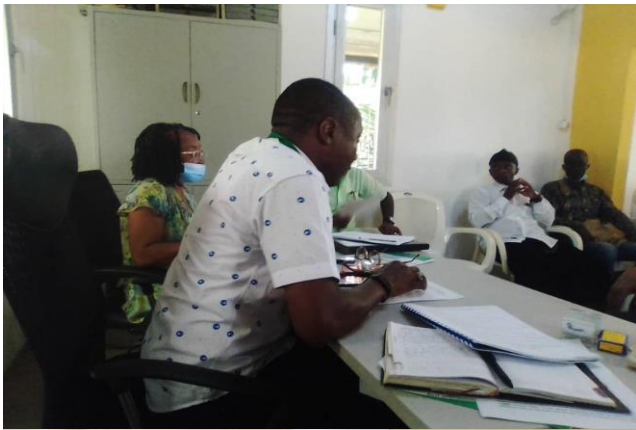


Photo 10: View of the participants in the public consultation

CHAPTER V. INVENTORY AND DESCRIPTION OF SOCIAL AND ENVIRONMENTAL IMPACTS

5.1. Methodology for analyzing the potential impacts of the project

The methodology used to assess environmental impacts is based on previous assessment experience, on the use of data collected during preliminary investigations (technical data on the installations, interviews and discussions with the promoter, with the local population, etc.) carried out by the consultant, and on the use of grids and tables established by the World Bank and commonly used for environmental impact assessments. The method used to identify the impacts was based on a cross-referencing of the components of the receiving environment with the activities carried out in relation to the project, using the identification or interaction matrix. This made it possible to highlight the interactions between the project activities and the relevant components of the environment likely to be affected by the activity concerned.

5.2. Tools and criteria for impact identification and assessment

The tools used are the simplified checklist, the interaction or identification matrix, the public consultation report and the Leopold matrix. The simplified checklist was used to identify the biophysical and human components of the environment likely to be affected on the one hand and the project activities on the other.

The identification matrix summarizes these interactions. In effect, this matrix is a two-dimensional table, used to identify the interactions between project activities on one axis and environmental elements on another axis. The "entries" in the boxes highlight the severity of the impacts or other characteristics of the impacts. This matrix has the advantage of allowing a double reading of the activities/effects of a project and certain components of the environment. It highlights the multiple causes of a given impact. The disadvantage is that it only allows an analysis of direct impacts. The table below illustrates the interaction matrix developed for this project.

Table 5 : Impact identification matrix

CONSTITUENT ELEMENTS OF THE ENVIRONMENT	BIOPHYSICAL										HUMAN											
	Air			Water			Soil			Biotope			Natural resources	Socio Economic aspects			Living environment			Heritage and Infrastructure		
Main criteria of impact assessment	Climate and ozone layer	Atmosphere		surface water	Underground water		Soil	Underground	Underground	Aquatic	Land			Conflicts	Local economy / jobs	Health / Safety	Noise	Smells	Landscape quality	Cultural and Archaeological patrimony	Material and real estate assets	Public facilities and infrastructure
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
Establishment phase (installation of the processing unit)	A	X	X			X	X	X					X	X	X	X			X	X	X	
Recruitment of labour	1											X										
Acquisition and transport of processing plant equipment	2		X			X	X	X				X	X	X		X		X		X	X	
Installation of processing plant equipment	3		X			X	X	X				X	X	X		X		X		X	X	

5.2.1. Impacts Identification

The identification of impacts aim at describing the relationships between the project and the impacts and refers to criteria and methods that are as objective as possible. These criteria include: nature, intensity, extent, duration, frequency, uncertainty and probability.

Impacts characterisation criteria

In order to characterise the impacts, i.e. to give them a rating that should lead to an assessment of their absolute or relative importance, seven criteria will be used in this study: scope, duration, intensity, occurrence, commutativity or interaction, reversibility, and value of the impact.

The extent or scope of the impact

This gives an idea of the spatial dimension of the impact. The factor considered is the proportion of the project's impact area; the scope can be regional, local or point. It is regional when the disturbance of the component studied goes beyond the Coastal region, whereas it is local when the disturbance is limited to the direct impact area of the project. It is punctual when the disturbance is localized to the immediate perimeter of the works.

Spatial scale or duration of impact

The duration of the impact indicates the manifestation of the impact in time. Three classes will be distinguished: short term (ST): when the disturbance is well circumscribed in time and stops with the end of the activity causing the impact, medium term (MT): when the impact may persist for one year after the end of the works, long term (LT): when the disturbance goes beyond one year after the end of the works.

Intensity or magnitude of impact

The intensity of the impact defines the degree of disturbance of the environment, which is a function of the degree of sensitivity or vulnerability of the component studied. This parameter is characterised by three classes:

1. **Strong:** the activity significantly alters or enhances one or more environmental components, calling into question their integrity or considerably diminishing their use, characteristics or quality;
2. **Medium:** the activity significantly affects the integrity of the component or its use without compromising its sustainability;
3. **Low:** the activity alters or enhances one or more environmental components in an inconspicuous way, without significantly changing their use, characteristic or quality.

Occurrence or probability of occurrence

The occurrence or probability of occurrence of the impact expresses the chances that an impact will occur. The impact can thus be certain (Cer) or probable (Pro).

Commutativity or interaction

The impact of an element by the project may be influenced by another project or activity taking place in the study area; or the project may amplify an existing impact. Thus an impact will be cumulative or not, in other words its interaction will be positive or not.

Reversibility

Reversibility is the possibility for an affected element of the environment to return to its initial state even over time. Two classes have been selected: Reversible (Re) to indicate that the affected environmental element is likely to return to its initial state and Irreversible (Ir) to indicate that the affected environmental element is no longer likely to return to its initial state.

Value

Value is the importance given to the affected component. It can be legal, scientific, economic, socio-cultural or related to the availability of the component under study. Three classes of value are distinguished: Highly valued (Hv) when more than two valuation criteria can be attributed to the element under consideration; Valued (V) when at least one valuation criterion is attributed to the element under consideration; Non-valued (Nv) when the element under consideration has no valuation criteria. The table below shows the qualification and symbol used for each parameter.

Table 6: Qualification and symbolism of characterization parameters

Parameters		Qualification and symbols
1	Scope or extent	- Regional (R) - Local (L) - National (N)
2	Duration	- Short term (Ct) - Medium term (Mt) - Long term (Lt)
3	Intensity	- High (H) - Medium (M) - low (L)
4	Occurrence	- Certain (Cer) - Probable (Pro)
5	Commutativity / Interaction	- Yes - No
6	Value	- Highly Valued (Hv) - Valued (V) - Not valued (Nv)
7	Réversibility	- Reversible (Re) - Irreversible (Ir)

5.2.2. Impact Assessment criteria

The methodological approach used to assess potential impacts is adapted to the methods recommended by the World Bank (World Bank, 1991), the Canadian Environmental

Assessment Agency (1994) and national ESIA regulations. It is essentially based on an assessment of the significance of the environmental impact, based on the identification of the sources of impact and their level of exposure (duration, extent and intensity). The purpose of the impact assessment will be to assign an absolute or relative significance to the impacts in order to determine the order of priority according to which the impacts should be mitigated or compensated.

Absolute importance

This will be assessed using Martin Fecteau's standard methodology. This method allows for the combination of three parameters, namely intensity, duration and extent, to determine the absolute significance of the impact as major, medium or minor. The Fecteau method respects the following principles:

1. Each parameter used to determine significance has the same weight;
2. If the values of two parameters have the same severity level, the corresponding value at that level is assigned regardless of the severity level of the third criterion;
3. If the values of the three parameters are different, it is given the value of average importance.

The table below shows the criteria for assessing the absolute significance of impacts.

Table 7: Absolute Impact Significance matrice

Intensity	Scope	Duration	Absolute importance
Strong	Regional	Long term	Major
		Midium term	Major
		short term	Major
	Local	Long term	Major
		Midium term	Average
		Short term	Average
	Punctual	Long term	Major
		Midium term	Average
		Short term	Minor
Average	Regional	Long term	Major
		Midium term	Average
		Short term	Average
	Local	Long term	Average
		Midium term	Average
		Short term	Average
	Punctual	Long term	Average
		Midium term	Average
		Short term	Minor
low	Regional	Long term	Major
		Midium term	Average
		Shorttt term	Minor
	Local	Long term	Average

		Midium term	Average
		Short term	Minor
	Punctual	Long term	Minor
		Moyenne	Minor
		Court terme	Minor

Relative significance

This will be determined by adding to the absolute significance all the other parameters: reversibility, occurrence, value of the affected component and the cumulative nature of the impact. When three of these four parameters are verified, the absolute significance of the impact will be increased, and when three of the four relativity parameters are not verified, the absolute significance will be reduced. If only two of the four relativity parameters are verified or not, the relative importance will be the same as the absolute importance.

Environmental measures will be proposed on the basis of relative importance. After application of these measures, a residual impact will remain. Finally, the overall assessment of the project on the environment will be obtained on the basis of the residual impacts.

5.2.3. Impact classification

Impacts can then be classified as

- **Direct impact:** expresses a cause and effect relationship between a project component and an element of the environment;
- **Indirect impact:** results from a direct impact and follows it in a chain of consequences;
- **Cumulative impact:** the result of a combination of impacts generated by the same project or by several projects in time (past, present or future) and space;
- **Residual impact:** impact remaining after the application of a mitigation measure.

5.3. Identification of environmental and social impacts

5.3.1. Valued Environmental Components

The identification of the Valued Environmental Components (VECs) of this project is based on two main sources: the general description of the environment and the information on communications and relations with the environment, and the description of the project, which allows the identification of the activities that cause impacts. The description of the environment and the project is based on existing documentation (impact study reports on the area, project

report). The description of the environment provides a general picture of the main components of the receiving environment.

In the context of this project, the valued components of the environment are

Physical component: Air

Human components: Socio-economic, health and well-being.

5.3.2. Project activities and inputs causing impacts-

The activities causing impact-for each project phase are listed in the table below.

Table 8: Activities causing impacts

Project phase	Activities causing impacts
<p>Establishment phase (Installation of the processing unit)</p>	<ul style="list-style-type: none"> ✓ Recruitment of skilled and unskilled labour ✓ Acquisition and transport of processing plant equipment ✓ Installation of processing plant equipment- Testing of machines
<p>Production phase (Transformation of wheat into flour)</p>	<ul style="list-style-type: none"> ✓ Receiving the wheat ✓ First cleaning ✓ Milling ✓ Second cleaning ✓ Wheat resting ✓ Blutage ✓ Adding the ingredients ✓ Incorporation of ingredients ✓ Conditioning ✓ Operation of the generator ✓ Storage ✓ Delivery ✓ Plant maintenance ✓ Vehicle traffic ✓ Waste management and diverse emissions
<p>Decommissioning phase (Dismantling of installations)</p>	<ul style="list-style-type: none"> ✓ Stopping semolina production activities; ✓ General cleaning of the flour mill; ✓ Dismantling and transport of equipment; ✓ Rehabilitation of the site.

5.4. Environmental and social impacts during construction, operation and decommissioning

The impacts according to the project activities and phases are presented in the table below

Table 9: Impacts according to project activities and phases

CONSTRUCTION PHASE		
Project phase	Activities causing impacts	Impacts
Establishment phase (Installation of the processing unit)	Recruitment of skilled and unskilled labour	<ul style="list-style-type: none"> ✓ Increase in household income ✓ Job creation ✓ Increase in local economy
	Installation of processing plant equipment	<ul style="list-style-type: none"> ✓ Risk of accident ✓ Noise pollution
	Functional testing of machines	<ul style="list-style-type: none"> ✓ Risk of accident ✓ Noise pollution
	Acquisition and transport of processing plant equipment	<ul style="list-style-type: none"> ✓ Risk of accident ✓ Noise pollution ✓ Degradation of air quality by gases
OPERATION PHASE		
Project phase	Activities causing impacts	Impacts
Production phase (transformation of wheat into flour)	Wheat reception	<ul style="list-style-type: none"> ✓ Risk of accidents ✓ Risk of spillage ✓ Risk of fire
	First cleaning	<ul style="list-style-type: none"> ✓ Noise pollution
	Milling Grinding Second cleaning Wheat resting Blasting Addition of ingredients Incorporation of ingredients Conditioning	<ul style="list-style-type: none"> ✓ Risk of explosion ✓ Risk of fire ✓ Noise pollution ✓ Risk of accidents ✓ Degradation of air quality (presence of flour particles in the air) ✓ Equipment malfunction
	Operation of the generator	<ul style="list-style-type: none"> ✓ Fire risk ✓ Soil pollution by hydrocarbons (accidental petrol spill) ✓ Degradation of air quality (CO2 emissions and noise)
	Storage	<ul style="list-style-type: none"> ✓ Risk of spillage ✓ Risk of explosion
	Delivery Vehicle traffic	<ul style="list-style-type: none"> ✓ Noise pollution ✓ Risk of accidents ✓ Degradation of air quality by exhaust gases
	Maintenance of facilities	<ul style="list-style-type: none"> ✓ Wastewater production
	Waste Management	<ul style="list-style-type: none"> ✓ Production of solid waste (debris from packaging bags, sounds, office waste etc.) ✓ Visual and olfactory nuisance

DISMANTLING PHASE		
Project phase	Activities causing impact	Impacts
Decommissioning phase (Dismantling of the installations)	Stopping the production of semolina	Loss of employment
	General cleaning of the mill	Waste water production
	Dismantling and transport of equipment	Risk of accidents Production of solid waste Noise pollution Degradation of air quality
	Site rehabilitation	Waste production Visual and olfactory nuisance

5.5. Description and assessment of project impacts

5.5.1. Construction phase impact

C1. Impact related to the degradation of air quality by dust and exhaust fumes

The transport of materials and personnel by trucks will undoubtedly cause dust to be raised if the work is carried out during the dry season. In addition, the exhaust fumes from the machinery (generator, transport vehicle) are also a source of pollution. Air quality is affected by the effects of several activities of the same project which will accumulate (cumulative impact) and may become significant. The impact on air quality is negative in nature, direct, short-lived, of medium intensity and local in extent. These criteria give the impact a medium absolute significance. It is certain to occur, reversible and non-valued. It is therefore assessed as being of **medium relative importance**.

C.2. Impact related to noise

The activities that cause noise pollution will be: procurement and transport of processing plant equipment, testing and operation of machinery, installation of processing plant equipment. Noise can lead to occupational diseases or accidents. The generation of noise and vibrations related to the operation of the equipment constitutes a direct negative impact of medium duration, as the noise nuisance will last for the duration of the project. The occurrence of this impact is certain; however, the noise level will be restored very quickly once the work is completed, hence its reversible nature. The impact is occasional. This impact is of high intensity. Protection against noise pollution is valued by the State (Article 60 aliéνας 1, 2 and 3 of the Framework Law on Environmental Management). The evaluation criteria allow us to say that the absolute importance of this impact is medium. The same applies to the **relative importance**, which is judged to be **medium**.

C.3. Impact related to increased income for local populations

The existence of new construction sites automatically leads to the development of small businesses (mobile restaurants, pubs, stalls) around the site. These second-hand sellers find a

lucrative activity and will thus increase their income during the construction period. This direct impact is positive in nature, of medium intensity, short duration (just the time of the works) and local in scope. Following this characterisation, the impact is deemed to be of medium absolute importance. It is certain to occur and is assessed as an impact of **medium relative importance**.

C.4 Impact related to job creation

Socially, the creation of a large number of jobs will, among other things, reduce the social divide between the poor and the rich, and the families whose members will be hired will experience an improvement in their living conditions during the project. The unskilled workers should be recruited from the local population, even if this work is temporary, it will allow some families to increase their income. This direct impact is positive in nature, strong in intensity, long-lasting (just the time of the works) and national in scope. Following this characterisation, the impact is judged to be of medium absolute importance. After the addition of the occurrence characterised as certain and highly valued, it is assessed as an impact of **major relative importance**.

C.5 Impact related to the risk of personal injury and material accidents

Many of the project operations (storage, wheat reception) present risks of accidents. These are : the acquisition and transport of the processing plant equipment, the installation of the processing plant equipment, and the testing of the machines. The events that can cause accidents are :

- Tripping, bumping or other disruption of movement
- Collapsing and falling objects
- Falling from height;
- Noise nuisance;
- Vehicle traffic;
- Electrification;
- Mechanical handling;
- Falling equipment.

Accidents can also be caused by mishandling of equipment, which can result in personal injury, some of which can be fatal. This impact is of probable occurrence and direct interaction, as it is caused directly by the project activities. It is long term, the victim may be disabled for life. Its intensity has been judged as high when considering that accidents can lead to severe disabilities. It will occur within the construction site, therefore the scope has been judged to be local. This impact is of medium absolute and **relative importance**.

C.6 Impact related to health and safety at work

During the construction phase, it is important to emphasise the risks of accidents (work accidents, traffic accidents) that may occur with the movement of vehicles and machinery on the site. Dust emissions, exhaust gases, lubricants and various types of waste may cause health risks (respiratory illnesses, asthma, eye diseases) and nuisances (odours and visual pollution) in the immediate vicinity of the site.

The exposure of affected personnel to the intense noise of machinery and engines could lead to negative effects on hearing, psychosomatic illnesses and nervousness.

The presence of foreign personnel, workers, in the affected communities and the subsequent mixing with the populations living near the site could favour the spread of communicable diseases, particularly HIV/AIDS and the spread of COVID 19. This impact is negative, indirect, long term, local in scope, high in intensity, likely to occur, irreversible, highly valued and of major absolute significance. Therefore, the ***relative importance of this impact*** is considered ***major***.

5.5.2. Impacts during the operational phase

E.1 Impact related to the degradation of air quality

During the operation phase of the project, a certain number of activities may alter the quality of the ambient air. These include the handling of machinery and the handling of raw materials (wheat reception). The air could be polluted by gases from transport vehicles (vehicle traffic). Emissions of dust and other fine particles (wheat particles) are unavoidable during vehicle movements, especially during the dry season and also during the processing of wheat into flour. Air pollution is a direct negative impact, of medium intensity, of long duration, as it will last as long as the company operates. This impact of certain occurrence is local in scope as the dust will be produced just in the project area. The air element that is affected is highly valued insofar as the framework law on environmental management in its article 21 insists on the preservation and protection of the atmosphere. In accordance with the evaluation criteria, the absolute importance of this impact has been assessed as medium. The same applies to the ***relative importance, which was assessed as medium***.

E.2 Impact related to the production of solid and liquid waste (waste oil, grease, hydrocarbons)

During its operation, the company will produce solid waste (office waste, electronic waste, household waste) and liquid effluents (liquids from the cleaning and maintenance of machinery). On the operation site, the machinery uses petrol and diesel as engine power sources. In addition, the generators that run on fuel are lubricated with oil and grease. This

impact is negative, direct, long-lasting, punctual and of high intensity. It is assessed as being of major absolute significance. It is likely to occur, not valued, reversible and assessed as being of **major relative importance**.

E.3 Impact related to the risk of road accidents due to increased traffic

The presence of distribution vehicles to supply the points of sale will certainly cause an increase in traffic. This increase in traffic can cause numerous road accidents. This impact is negative, long-lasting, local and intense. This impact is of major absolute importance. This impact is likely to occur, not valued and irreversible. It is considered to be of **major relative importance**.

E.4 Impact related to the risk of injury

During this phase, accidents may occur during the use of equipment or in the event of spillage of wheat at reception. These accidents can result in cuts, more or less serious fractures due to the fall of an employee, an instrument, a shock or poor handling of the equipment. This impact is negative, direct, of long duration, of punctual extent, of high intensity, of probable occurrence, irreversible/reversible and of major **absolute and relative importance**.

E.5. Impact related to the risk of explosion

Activities such as the storage of wheat and flour, transport, handling of equipment, the use of the generator, the operation of equipment (mills, cylinder equipment, pre-cleaning and cleaning etc) are likely to cause explosions. This impact is negative, direct, of long duration, of punctual extent, of high intensity, of probable occurrence, reversible and of major **absolute and relative importance**.

E.6 Impact related to fire risk

During operation, energy resources such as diesel and petrol are used to ensure the operation of the generator set or the transport vehicles. However, although useful, mishandling of these resources can cause a fire. This impact is negative, long-lasting, indirect, one-off, high intensity, likely to occur, reversible and of **medium relative importance**.

E.7 Impact related to noise pollution

During the operational phase, the noise emitted by vehicle engines and equipment vibrations (generator, boiler, bagging machine) could be a source of noise nuisance for local residents. The basis for the analysis of noise levels and associated effects is twofold, namely the literature and Order No. 039/MTPS/IMT. The literature, in particular the book entitled "Noise, 1982 edition" presents the effects of prolonged exposure to different noise levels as follows

- 00 to 50dB: light noise;

- 50 to 70dB: annoying noises;
- 70 to 90dB: tiring noises;
- 90 to 120dB: dangerous noises;
- 120dB: unbearable noise;

The analysis also drew on Order No. 039/MTPS/IMT of 26 November 1984 laying down general health and safety measures in the workplace and specifying that the noise level in the vicinity of a workstation must not exceed 85 decibels (dB). Noise nuisance is a negative, direct impact of medium duration, punctual extent and medium intensity. These criteria give the impact a medium absolute importance. It is certain to occur, reversible and not valued. It is therefore assessed as being of ***medium relative importance***.

E.8. Impact related to odour nuisance

The operation of the fuel-powered machines and generators will probably emit odours. However, these odours are not significant and would not be harmful to employees. They are therefore negligible. The olfactory nuisance is a negative, direct, medium-term, one-off, low-intensity, certain and reversible impact. These criteria give the ***impact a low absolute and relative importance***.

E.9 Impact of equipment failure

During the operation of the company, the workers could face a breakdown of one of the machines, creating a malfunction in the whole system. This could result in several material and even human damages. This impact is direct, negative in nature, short-lived, one-off and of low intensity. This impact is considered to be of medium absolute importance. It is likely to occur, not valued and reversible. It is considered to be of **minor relative importance**.

E.10 Impact related to the risk of interaction with other industries in the area

The project site is close to a shop owned by the company COCIMENCAM.

The project activities can seriously impact this warehouse if during the execution of the tasks a fire occurs and it is not quickly controlled. This impact is direct, negative in nature, long-lasting, one-off and of high intensity. This impact is considered to be of medium absolute importance. It is likely to occur, not valued and reversible. It is considered to be of **medium relative importance**.

E.11. Analysis of the cumulative impacts of the project

In the vicinity of the project site, there are warehouses for the storage of products belonging to companies. The transport activities could be amplified as a result of the use of the road by all these companies. This could increase the risk of accidents, noise pollution and degradation of the road. These impacts are of a negative nature, direct, long term, local in extent, high intensity, certain to occur, irreversible/reversible and of **major absolute and relative significance**.

5.5.3. Impacts during decommissioning phase

F 1 : Risk of environmental pollution

The objective of the dismantling and clean-up operations of the production plant installation will be to bring the installation to a state of decontamination compatible with the industrial reuse of the buildings. If this objective is not achieved at all points of the installation, the risk of environmental pollution or contamination of future users is high. This impact is negative, direct, of long duration, of punctual extent, of medium intensity, of probable occurrence and reversible. All of these characterisation criteria give the impact a **relative absolute importance that is considered to be medium**.

F 2 : Impact related to job losses

When the company closes, employees will lose their jobs. They will either have to manage to find another job or become self-employed. The loss of jobs causes a lot of stress and financial difficulties for both the former employees and their families. The impact is negative, direct, long-lasting, one-off, of medium intensity, likely to occur and reversible. All of these characterisation criteria give the **impact a relative absolute significance** that is considered to be **medium**.

F 3: Impact related to the production of solid and liquid waste

The dismantling of installations is a harsh process whose objective is to decontaminate an industrial site, equipment, buildings and vehicles.

The work carried out during the dismantling phase of the installations is :

- Dismantling the internal structures of the premises.

- Dismantling of the general auxiliary circuits.
- Dismantling the equipment in the technical rooms.
- Dismantling the liquid effluent tanks.
- Dismantling of handling equipment.

The dismantling of installations is likely to produce liquid and solid waste.

The solid waste is the pieces of equipment and office waste and the liquid waste is the liquid from the emptying and cleaning of the tanks. This impact is direct, negative in nature, of high intensity, long duration and regional in scope. Following this characterisation, the impact is deemed to be of major absolute importance. It is of probable occurrence and highly valued and assessed as an impact of **major relative importance**.

F 4: Impact related to the degradation of air quality

During the closure of the company, activities such as the dismantling and transport of equipment may alter the quality of the ambient air. The noise emitted during the dismantling of the equipment will disturb the air quality and the air could also be polluted by gases emanating from the transport vehicles (vehicle traffic). The degradation of air quality is a direct negative impact, of medium intensity, of short duration, reversible and unvalued. This impact, which is certain to occur, is of a one-off nature. In accordance with the assessment criteria, the absolute significance of this impact has been assessed as **minor**.

Table 10: Project impact assessment matrix

SSScopeENVIRONMENTAL ELEMENTS		SOURCES OF IMPACT	code	IMPACTS	CHARACTERISATION PARAMETER								ASSESSMENT			
					Nature	Interaction	Duration	Scope	Intensity	Absolute importance	Occurrence	Reversibility	Cumulative	Value	relative importance	Significance
CONSTRUCTION PHASE																
Physical environment	Air	Gas emission, Dust	C.1	Degradation of air quality by dust and exhaust fumes	-	D	st	L	Av	Av	C	Rev	Yes	Nv	Me	Yes
Human environment		Recruiting the workforce	C.2	Noise pollution	-	D	st	P	Av	Av	C	Rev	No	Nv	Me	Yes
		Installation of plant equipment	C.3	Increased income for local people	+	In	st	L	Av	Av	C	Ir	Yes	Hv	Me	Yes
		Testing the operation of machines	C.4	Job creation	+	D	Lt	R	Av	Ma	C	Ir	No	Hv	Maj	Yes
			C.5	Risk of physical injury	-	D	Lt	P	L	Av	L	Ir	No	Nv	Me	Yes
			C.6	Occupational health and safety risk	-	D	Lt	L	L	Ma	L	Ir	No	Hv	Maj	Yes

		code	IMPACTS	CHARACTERISATION PARAMETER	ASSESSMENT
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ENVIRONMENTAL ELEMENTS		SOURCES OF IMPACT		OPERATION PHASE													
				Nature	Interaction	Duration	Scope	Intensity	Absolute importance	Occurrence	Reversibilities	Cumulative	Value	Relative importance	Significance		
Physical environment	Air	Dust emission, gas emission and boiler smoke	E.1	Degradation of air quality	-	D	Lt	L	Av	Av	C	Rev	Yes	Hv	Me	Yes	
Human environment	Accident	Operation of production units	E.2	Generation of liquid solid waste	-	D	Lt	P	St	Av	L	Rev	No	Nv	Me	Yes	
		Operation of facilities	E.3.	Risk of road accidents due to increased traffic	-	In	Lt	L	St	Maj	L	Ir	No	Nv	Maj	Yes	
	E.4.		Accident to persons and property on the operating site	-	D	Lt	P	St	Av	L	Ir	No	Nv	Me	Yes		
	E.5		Risk of explosion	-	D	Lt	P	St	Maj	L	Rev	No	Nv	Maj	Yes		
	E.6.		Risk of fire	-	In	Lt	P	St	Av	L	Rev	No	Nv	Me	Yes		
	Employment	Operation of facilities	E.7	Noise pollution	-	D	Mt	P	Av	Av	C	Rev	No	Nv	Me	Yes	
			E.8	Olfactory pollution	-	D	Mt	P	Wk	Min	C	Rev	No	Nv	Min	No	
			E.9.	Risk of equipment failure	-	D	Lt	P	St	Min	L	Rev	No	Nv	Min	Yes	
			E.10	Risk of interaction with other industries	-	D	Lt	P	St	Av	L	Rev	No	Nv	Me	Yes	
			E.11	Cumulative impact (road accident, noise pollution)	-	D	Lt	L	St	Maj	C	Rev/Ir	Yes	Nv	Maj	Yes	

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IMPACTS

CHARACTERISATION PARAMETER

ASSESSMENT

ENVIRONMENTAL ELEMENTS	SOURCES OF IMPACT				Nature	Interaction	Duration	Scope	Intensity	Absolute importance	Occurrence	Reversibilities	Cumulative	Value	Relative importance	Significance
CLOSURE AND DISMANTLING STAGE																
Human Environment	Closure and dismantling	Dismantling Cleaning of the site	F.1	Risk of environmental pollution or contamination of people	-	D	Lt	P	Av	Av	L		Non	Nv	Av	Yes
		Stopping production activities	F 2	Job losses	-	D	Lt	P	Av	Av	C	Rev	Non	Hv	Av	yes
		Dismantling and dismantling of equipment Cleaning up the site	F 3	Waste generation	-	D	Lt	R	St	Maj	L		Non	Hv	Maj	Yes
		Rehabilitation of the site	F 4	Degradation of air quality	-	D	St	P	Av	Min	C	Rev	Non	Nv	Min	No

Legend

Nature	Interaction	Duration	Scope	Intensity	Occurrence	Reversibility	Importance	Value
+ (positive) - (negative)	D (direct) I (indirect)	Sh (Short term) Lt (Long term) Av (Average)	P (Punctual) L (Local) R (Regional)	St (Strong) Wk (Weak) Av (Average)	L (ILikely) C (certain)	Rev (reversible) Ir (irreversible)	Min (minor) Maj(Major) Av (Average)	Nv (not valued) Hv (highly valued)

5.6. Summary of the different impacts and risks of the project

After the identification, description and evaluation of the impacts (construction, operation and decommissioning phase), it was noted that some impacts are significant (major or medium importance) and others are not significant (minor importance). This section summarises the significant negative and positive impacts and proposes mitigation measures for negative impacts and improvement measures for positive impacts.

Table 11: Summary of project impacts and risks

CONSTRUCTION PHASE			
Environmental components	Negative and positive impacts/risk	Criteria	Assessment
Air	Degradation of air quality	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Likely • Medium
Human	Noise pollution	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Certain • Medium
	Risk of injury	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Certain • Medium
Human	Increased income for local people	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Likely • Medium
	Creation of temporary jobs	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Certain • Medium
	Occupational health and safety risk	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local

		<ul style="list-style-type: none"> • Occurrence • Importance 	<ul style="list-style-type: none"> • Certain • Medium
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OPERATION PHASE			
Components of the environment	Negative and positive impacts/risk	Criteria	Assessment
Air	Degradation of air quality	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Certain • Medium
Human	Solid and liquid waste generation	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Certain • Medium
	Risk of road accidents	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Likely • Medium
	Risk of physical injury	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Likely • Medium
	Risk of explosion	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Local • Likely • Medium
	Risk of fire	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Indirect • Negative • Long • Strong • Punctual • Likely • Medium

OPERATION PHASE			
Components of the environment	Negative and positive impacts/risk	Criteria	Assessment
Human	Noise pollution	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Average • Medium • Punctual • Certain • Medium
	Olfactory pollution	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Low • Medium • Punctual • Certain • Minor
	Risk of equipment failure	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • short • Strong • Punctual • Likely • Mnor
	Risk of interaction with other industries	<ul style="list-style-type: none"> • Interaction • - Nature • - Duration • - Intensity • - Scope • - Occurrence • - Importance 	<ul style="list-style-type: none"> • Direct • Negative • Long • Strong • Punctual • Likely • Medium
	Cumulative impacts	<ul style="list-style-type: none"> • Interaction • - Nature • - Duration • - Intensity • - Scope • - Occurrence • - Importance 	<ul style="list-style-type: none"> • Direct • Négative • Long • Strong • Punctual • Likely • Medium

CLOSURE AND DISMANTLING PHASE			
Component	Negative and positive impacts/risk	Criteria	Assessment
Human	Risk of environmental pollution or contamination of people	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Long • Medium • Punctual • Likely • Medium
	Lost of job	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Long • Medium • Punctual • Certain • Medium
	Waste generation	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Long • Strong • Regional • Likely • Major
	Degradation of air quality	<ul style="list-style-type: none"> • Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance 	<ul style="list-style-type: none"> • Direct • Negative • Short • Medium • Punctual • Certain • Minor

5.7. Mitigation and improvement measures for project impacts

The following tables list the significant impacts and propose mitigation and/or enhancement measures.

Table 12: Measures in the construction phase

Impacts	Mitigation or improvement measures
Noise pollution and air quality degradation	Permanent maintenance of vehicles and other equipment
	Use low-noise machinery and equipment
	Equip workers at risk with helmets and/or earplugs
Waste generation	Recycle and recover construction waste
	Set up a special waste storage area
	Have hazardous waste removed by authorised specialist services
	Equip the site with bins according to the nature of the waste
Health and safety risk	Organise STI/AIDS screening sessions for workers
	Provide workers with clean water and soap for hand washing
	Provide workers with hydro-alcoholic gels to disinfect their hands
	Recruit a doctor and an occupational nurse
	Raise awareness among staff about compliance with barrier measures (COVID 19)
	Take out health insurance for employees
	Take care of HIV-positive workers
Deterioration of employee health	Conducting quarterly medical check-ups for employees
	Insure staff
	Have a health care agreement
Job creation	Give priority to local people with equal skills; ;
	Prioritise local companies as service providers
	Have contractors publish the conditions of recruitment of employees
	Affiliation of staff with the CNPS
	Paying appropriately for services
	Respecting the terms of the contracts signed with the employees

Table 13: Measures in the operational phase

Impacts	Mitigation or improvement measures
Risk of personal injury and material damage	Recruiting a permanent HSSE (Health, Safety, Environment) team
	Implement and manage an HSSE management system
	Have an infirmary for first aid and occupational medicine
Degradation of air quality and gaseous emissions	Analyse every 6 months the gaseous emissions of the equipment (boilers, generators, ...) and record the data
	Provide filters and air cleaners in confined spaces
	Ensure the maintenance of the equipment and management of the induced effects
Waste production and odour/visual nuisance	Have hazardous waste removed by an approved facility and traceable (manifest)
	Set up a special waste storage area
	Recycle or recover biodegradable waste
Risk of fire	Build sand traps or water tanks
	Train staff in fire safety measures
	Equip the site with fire extinguishers and RIA
Risk of accidents due to increased traffic	Raise awareness of good driving behaviour among staff. .
	Train and recruit qualified drivers
Noise pollution	Maintain the equipment on a permanent basis
	Delineate noise zones (noise mapping)
	Equip workers with anti-noise helmets and earplugs
Risk of equipment malfunction	Carrying out maintenance of equipment
	Checking lifting, gas and steam equipment
Risk of explosion	Carry out regular maintenance of machines and equipment
	Recruit an HSE manager
	Conduct a hazard assessment and draw emergency plan

Table 14: Measures in the closure and decommissioning phase

Impacts	Mitigation or improvement measures
Risk of environmental pollution	Carry out an environmental audit of the closure of the unit
	Inspect the facilities
	Restore the site
	Have waste and hazardous substances removed for treatment by authorised facilities
	Empty, clean and rinse liquid effluent circuits and tanks
Loss of jobs	Discuss with MINTSS and the trade unions the conditions of liquidation of employees' rights
	Pay employee entitlements
Generation of hazardous waste	Arrange waste storage areas by nature
	Have the waste from the dismantling of the installations treated by approved companies.

CHAPTER VI. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This chapter presents the simple environmental and social management plan of the project. It is illustrated by the tables according to each phase. These tables include potential impacts, corrective actions, specific objectives, the person responsible, the source of funding, the cost of the operation, the timeframe for completion and objectively verifiable indicators.

6.1. Environmental and social management plan

The Environmental and Social Management Plan (ESMP) is implemented during all phases of the project: development, construction, operation and closure. All of this is in response to identified environmental impacts and risks.

The tables on the following pages represent the plan developed as part of this study. They highlight the following points :

- Potential impacts ;
- Mitigation and/or enhancement measures;
- Specific objectives of the measure;
- Implementer responsible ;
- Responsible for monitoring;
- Source of funding ;
- Amount in 10³ FCFA ;
- Timeframe for implementation ;
- Objectively verifiable indicators.

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Table 15: Environmental and Social Management Plan for the development and construction phase

Potential impacts	Mitigation measures	Specific objectives	Responsible for implementation	Responsible for monitoring	Funding	Amount (10 ³ FCFA)	Time frame	Objectively verifiable indicators
CONSTRUCTION PHASE								
Risk of noise and air pollution	Continuously carry out technical inspections and revisions of vehicles and machinery	Avoid Airr l pollution	Construction company	CDS ESMP Consulting Engineer	AFISA.S.A	Adhoc	2022-2023	Site report
Risk of personal and material accidents on the site	Draw up and implement an HSSE plan for the site	Site security	Construction company	CDS ESMP Consulting Engineer	AFISA.S.A	Adhoc	2022-2023	Presence of an HSSE plan
	Put up vertical and horizontal signs at work sites	Site security	Construction company	CDS ESMP MINSANTE	AFISA.S.A	Adhoc	2022-2023	Presence of signage
	Recruit a permanent HSSE manager to the site	Ensure the safety of employees	Construction company	CDS ESMP	AFISA.S.A	5 00	2022-2023	Site organisation chart
	Equip staff with PPE and ensure its use	Avoiding accidents	Construction company	CDS ESMP	AFISA.S.A	5 000	2022-2023	Presence of PPE
	Set up a first-aid infirmary	Provide first aid to employees	Construction company	CDS ESMP	AFISA.S.A	Ad hoc	2022-2023	Presence of infirmary
Waste generation	Ensuring environmentally friendly management of construction waste	Avoid pollution	Construction company	CDS ESMP	AFISA.S.A	/	2022-2023	Presence of waste
	Equip the site with waste bins according to their nature	Avoid pollution	Construction company	CDS ESMP	AFISA.S.A	2 000	2022-2023	Presence of bins
	Have hazardous waste removed by authorised specialist services	Ensure cleanliness on the site	Construction company	CDS ESMP	AFISA.S.A	/	2022-2023	Presence of partnership agreements
Job creation	Give priority to recruiting local people with the same skills	Avoid frustration	Construction company	CDS ESMP	AFISA.S.A	/	2022-2023	Workers' testimonies
	Registering staff with the CNPS	Avoid frustration	Construction company	MINTSS	AFISA.S.A	/	2022-2023	Workers' testimonies
Total ESMP estimate for the development and construction phase						7 500 000	2022-2023	

Table 16 : Environmental and social management plan - operational phase

Potential impacts	Mitigation measures	Specific objectives	Responsible for implementation	Responsible for monitoring	Funding	Amount (10 ³ FCFA)	Time frame	Objectively verifiable indicators
OPERATIONAL PHASE								
Risk of personal injury and material damage	Recruit a permanent QHSSE Environmental Manager	Take QHSSE into account	AFISA.S.A	CDS ESMP	AFISA.S.A	400	2022-2026	Company organisation chart
	Set up and manage a QHSSE management system	QHSSE management	AFISA.S.A	Consulting Engineer	AFISA.S.A	/	2022-2026	QHSSE report
	Recruit a nurse and an occupational physician	Ensure the health of staff	AFISA.S.A	CDS ESMP MINSANTE	AFISA.S.A	Ad hoc	2022-2026	Health report
Degradation of air quality and gaseous emissions	Analyse gas emissions from equipment (boilers, generators, etc.) every 6 months and record the data	Reduce gas emissions	AFISA.S.A	CDS ESMP	AFISA.S.A	600	2022-2026	QHSSE report
	Ensure the maintenance of the equipment and management of the induced effects	Reduce the risk of air pollution	AFISA.S.A	CDS ESMP	AFISA.S.A	/	2022-2026	Method service report
Waste production and odour/visual nuisance	Put in place waste bins and have hazardous waste removed by an approved structure and have traceability	Avoid pollution of the natural environment	AFISA.S.A	CDS ESMP	AFISA.S.A	2 500	2022-2026	Manifestos ; Environmental permits
	Set up a special waste storage area	Limit the impact area	AFISA.S.A	CDS ESMP	AFISA.S.A	/	2022-2026	Waste management report
	Remove biodegradable waste from the site by burying it	Avoid pollution	AFISA.S.A	CDS ESMP	AFISA.S.A	/	2022-2026	Waste management report
Job creation	Recruit local residents with equal competence	Avoid frustration	AFISA.S.A	CDS ESMP	AFISA.S.A	Ad hoc	2022-2026	Recruitment report
Risk of fire	Train staff in fire safety measures	Reduce the risk of fire	AFISA.S.A	CDS ESMP	AFISA.S.A	5 000	2022-2026	Training report
	Equip the site with fire extinguishers and RIA	Ensure protection	AFISA.S.A	CDS ESMP	AFISA.S.A	Ad hoc	2022-2026	Presence of fire extinguishers and RIA
Noise nuisance	Maintain the equipment permanently	Reduce noise	AFISA.S.A	CDS ESMP	AFISA.S.A	Ad hoc	2022-2026	HSE report
	Delimit noise pollution zones (noise mapping)	Reduce noise	AFISA.S.A	CDS ESMP	AFISA.S.A	Ad hoc	2022-2026	Noise mapping report

	Equip workers with anti-noise helmets and earplugs	Protect staff	AFISA.S.A	CDS ESMP	AFISA.S.A	1 000	2022-2026	Number of staff equipped with PPE
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Potential impacts	Mitigation measures	Specific objectives	Responsible for implementation	Responsible for monitoring	Funding	Amount (10 ³ FCFA)	Time frame	Objectively verifiable indicators
Occupational health and safety risk	Organise STI/AIDS screening sessions	Reduce infections	AFISA.S.A	DD Health District	AFISA.S.A	4 000	2022-2026	Medical visit report
	Take care of HIV-positive employees	Reduce mortality	AFISA.S.A	DD Health District	AFISA.S.A	/	2022-2026	Medical visit report
	Provide clean water and soap to workers	Limit the spread of VIDCO 19	AFISA.S.A	DD Health District	AFISA.S.A	500	2022-2026	Medical visit report
	Educate workers on barrier measures	Limit the spread of COVID 19	AFISA.S.A	DD Health District	AFISA.S.A	Adhoc	2022-2026	Medical visit report
	Recruit a doctor and a nurse	Ensuring staff health	AFISA.S.A	CDS ESMP MINSANTE	AFISA.S.A	Ad hoc	2022-2026	Health report
Risk of malfunctioning of any part of the plant system	Create and equip a maintenance department	Good facility management	AFISA.S.A	CDS ESMP	AFISA.S.A	Adhoc	2022-2026	Organization chart
	Maintain the equipment	Plan maintenance	AFISA.S.A	CDS ESMP	AFISA.S.A	/	2022-2026	Data report
	Checking gas and steam equipment	Quality assurance of materials	MINMITD	CDS ESMP	AFISA.S.A	500	2022-2026	Test certificates
	Checking lifting equipment		MINMITD	CDS ESMP	AFISA.S.A	500	2022-2026	Test certificates
Risk of explosion	Conducting a hazard survey	Ensuring employee safety	MINMITD	CDS ESMP	AFISA.S.A	Adhoc	2022-2026	Certificates of compliance
	Carrying out machine maintenance		MINMITD	CDS ESMP	AFISA.S.A	Adhoc	2022-2026	MINMITD Report
Total ESMP estimate for the operational phase			15 000 000 FCFA				2022-2026	

Table 17: Environmental and social management plan - closure phase

Potential impacts	Mitigation measures	Specific objectives	Responsible for implementation	Responsible for monitoring	Funding	Amount (10 ³ FCFA)	Time frame	Objectively verifiable indicators
CLOSURE PHASE AND DISMANTLING								
Generation of hazardous waste	Conducting an environmental audit of the closure of the unit	Reducing impacts	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure	Closure audit report
	Inspection of the facilities	Environmental review	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure	Inspection report
	Restore the site	Environmental remediation	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure	Works report
	Have waste and hazardous substances removed for treatment by authorised facilities	Avoiding pollution	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure	HSSE report
	Drain, clean and flush liquid effluent circuits and tanks	Avoiding pollution	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure	HSSE report
Loss of jobs	Discuss with MINTSS and the unions the conditions for the liquidation of employees' rights	Administrative process	AFISA.S.A	MINTSS	AFISA.S.A	For remembrance	Year of closure	Tripartite agreement
	Pay employees' rights	Avoiding frustration	AFISA.S.A	MINTSS	AFISA.S.A	For remembrance	Year of closure	Tripartite agreement
Risk of environmental pollution	Arrange the waste storage areas by type	Avoiding pollution	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure	HSSE report
	Have the waste from the dismantling of the installation treated by the companies in charge of the ecological management of each type of waste;	Avoiding pollution of the natural environment	AFISA.S.A	CDS PESMP	AFISA.S.A	For remembrance	Year of closure e	Contract Destruction report
Total ESMP estimate for the closure phase			For remembrance				Year of closure e	

6.2. Environmental monitoring and follow-up programme

Environmental and social monitoring and follow-up are important activities that should not be overlooked in the environmental and social management plan. These activities help to :

- Ensure that mitigation measures are effectively implemented ;
- Identify the presence of unforeseen impacts ;
- See if the environmental protection measures implemented are effective and/or if corrective measures can be taken.

In the framework of this project, a monitoring plan should be put in place during the phases (development, construction, operation and closure).

Monitoring will be carried out on the basis of :

- The content of the semi-annual reports prepared by the construction company, including the report on preventive and mitigation measures as well as the Environmental and Social Management Plan;

According to the regulations, these reports are transmitted every 6 months to the Divisional Committee for Monitoring the ESMP and to MINEPDED

- Specific conditions included in the environmental authorisation documents issued by the State ;

- Clauses relating to the protection of the environment which must be included in the contractual documents.

Post-work monitoring includes :

- Inspections ;
- Visual observations ;
- Surveys ;
- Analysis ;

The environmental monitoring that will be carried out aims to verify :

- The effectiveness of the measures proposed in the Environmental and Social Impact Assessment report, including mitigation measures ;
- The conditions laid down in the various legal and regulatory instruments ;
- The commitments of the project owner and the project manager ;
- The requirements of other laws and regulations relating to public health and hygiene, management of the living environment, protection of the environment, natural resources and sensitive or fragile areas.

The main **objectively verifiable indicators** that will be used to monitor impacts will be the number of

- Accident cases ;
- Reports of environmental and social actions implemented
- Testimonies of beneficiaries and/or impact victims;
- People recruited.

The monitoring of the implementation of the environmental measures contained in the ESMP will be ensured by the Sub-Department of Environmental Impact Assessments of MINEPDED, which will define the details in accordance with Articles 27, 28 and 29 of Decree 2013/0171/PM of 14/02/2013. In addition, the works companies, AFISA S.A. and the administrations concerned will monitor the implementation of the ESIA and ESMP.

Monitoring and follow-up must be carried out at several levels of responsibility. The company carrying out the work and its subcontractors, and more specifically the people in charge of environmental issues in these companies, must keep a register of the measures implemented, which must be in accordance with the QHSSE policy of AFISA S.A.

Copies of this register must be sent to AFISA S.A., the independent environmental expert and to the ministries and agencies responsible for supervision. The following table contains important elements of this plan, especially during and after the works.

Table 18: Environmental and social monitoring plan

Activities	Affected component	Impact	Timeline monitoring and follow-up	Institutions/ Actors/	Indicators / means of verification
construction	Water	Risk of water quality disturbance	3 years	MINEE MINEPDED	Inspections Visual observations Registered complaints Reports of operations
	Sol, air,	Risk of air pollution, soil erosion	3 years	MINEPDED MINTP COMMUNE	Inspections Complaints registered Reports of operations Victims' testimonies
	Human	Employment	3 years	MINEPDED MINTSS MINAS	Inspections Recruitment reports Testimonies of workers List of the village chief
	Human environment	Risk of accidents during construction	3 years	MINMIDT MINEPDED MINAS MINSANTE	Inspections Report of the operations Victims' testimonies
Operation	Human environment		After work completion	MINEPDED MINAS MINSANTE	Visual observations Report of operations Victims' testimonies

CONCLUSION AND RECOMMENDATIONS

The project to build and operate the AFISA S.A. flour mill is an initiative aimed at satisfying households with foodstuffs such as wheat flour. The promoter of the project, concerned about the protection of the environment and the respect of regulations, requested the services of GES consulting to carry out a detailed environmental and Social Impact Assessment of its project.

In order to carry out the study, the consultancy firm carried out reconnaissance visits to the site, collected data from the authorities, and exchanged views with the stakeholders through public and individual consultations. The following tools were used during the study: the interaction matrix, the Assessment grid, the Leopold matrix, Google Earth, individual consultation sheets, data collection sheets and the checklist.

After data analysis, the consultancy wrote the detailed Environmental and Social Impact Assessment report for the construction and operation of the integrated farm.

The study shows that the project has some negative and positive impacts on the environment.

The impacts identified among others are:

- The risk of accidents ;
- Waste production ;
- Health and safety risk at work ;
- The degradation of air quality ;
- Loss of jobs in the event of closure of the mill;
- Job creation
- Increasing the local and national economy.

Although there are many negative impacts, most of these can be mitigated to an environmentally acceptable level. Therefore, to mitigate the effects of these negative impacts, mitigation measures have been proposed. These measures are

- Equip personnel with PPE and ensure their use ;
- Continuously carry out technical inspections and revisions of vehicles and machinery ;
- Have hazardous waste removed by specialized services ;
- Recruiting a doctor and a nurse for work;
- Raise awareness of STIs/AIDS among workers and the population ;
- Sensitise workers on COVID 19 ;
- Analyse every 6 months the gaseous emissions of the equipment ;
- Set up a special waste storage area;

- Respect the clauses of the contracts signed with the workers ;
- Recruit local people with equal skills as a priority.

These mitigation measures can only be implemented through the implementation of an Environmental and Social Management Plan (ESMP). The latter consists of a summary of the environmental and social measures recommended. For each of the proposed measures, it specifies the objectives, the various tasks to be carried out, the actors responsible for implementation, the location where the action will be carried out, the appropriate period for implementation, the objectively verifiable monitoring indicators and the actors for monitoring the effectiveness of the measure.

The approximate total cost for the implementation of the ESMP is **twenty-two million five hundred thousand CFA francs (22, 500,000 FCFA)**.

Finally, the study shows that the project is environmentally and socially viable. Because the impacts identified are for the most part controllable in view of the mitigation measures recommended and the cost necessary for their implementation. It also proposes that these mitigation measures be integrated into the contracts of the companies and transcribed, according to their nature, into the specifications of each of the main actors in the project.

This study concludes with recommendations to AFISA.S. A, which are formulated as follows:

R1: Recruit young people from the Essengue locality;

R2: Create a platform between the company and the community through the local chief;

R3: Take charge of the accidents recorded during the construction and operation phase of the company;

R4: Carry out a hazard study during operation.

BIOBLOGRAPHICAL REVIEW

Anonymous, Monography illustrating the DOUALA 1 Municipality

André P ; Delisle C.E ; Revéret J-P (2010). L'évaluation des impacts sur l'Environnement, 3eme édition processus, acteurs et pratique. Presses Internationales Polytechniques, Canada, 385P

BAD,2000, Procédures en matière d'étude environnementale relatives aux Opérations du secteur privé de la Banque Africaine de Développement

IAIA, 1999, Principles of Environmental Impact Assessment Bests Practices.

International Standard Organisation, 1996. Systèmes de management Environnemental – Lignes directrices générales concernant les principes. Norme Européenne - norme française NF EN ISO 14001. AFNOR Paris- France

ISIGE, 2000, Entreprise et développement durable, Cours Formation. Fontainebleau, France

Office National pour l'Environnement 1996, Directives générales pour une étude d'impact sur l'environnement. Madagascar

RECYCONSULT, 2007, L'analyse environnementale, note de Cours de Formation SME. Lyon- France

Rapport d'étude d'impact environnemental et social du projet de lotissement de terrains sur les berges du Wouri coté Deido arrondissement de Douala 1er

SDV-SAGA (DTI), 2007, Manuel des procédures HSE. 2^{ème} édition. Juillet 2007. Douala Cameroun

TEKEU J.C., 2004, Rapport sur la Pratique des Etudes d'Impact Environnementaux (EIE) au Cameroun.
Préparé pour la Commission Economique pour l'Afrique de Nations Unies. MINEP.
Yaoundé- Cameroun

Site internet consulté

<https://fr.tutiempo.net/qualite-de-lair/douala.html>

https://fr.wikipedia.org/wiki/Douala_1

<http://www.pad.cm/site/a-propos/infrastructures-portuaires/>

ANNEXES

- List of experts
- Letter of approval of the terms of reference ;
- Terms of reference ;
- Minutes of the public consultation;
- Ground plan

ANNEX 1: LIST OF EXPERTS

N°	Name	Qualification	Post
1	TANGA DJEUTA Marcel	Agro-Rural Engineering Engineer	Head of mission
2	ENANGUE BOSSAMBO M. Flore Epse BELL	Civil Engineering Engineer Msc in Environment	Deputy Head of Mission
3	MATENE Clarice	Master in Natural Resources Management	Ecologist
4	EYOUM PRISO Doris Alpha	Degree in Private Law	Lawyer
5	Natacha LONDJI	Master	Environmentalist
6	KABEYENE Patrick	Master in Public Law	Expert Sociologist

ANNEX 2: LETTER OF APPROVAL OF THE TERMS OF REFERENCE

REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie

MINISTRE DE L'ENVIRONNEMENT,
DE LA PROTECTION DE LA NATURE
ET DU DEVELOPPEMENT DURABLE

CABINET DU MINISTRE

10121
N° /L/MINEPDED/CAB/CST

V/Réf : N°08/07-21/FD/DG/ AFISA du 08 juillet 2021



REPUBLIC OF CAMEROON
Peace - Work - Fatherland

MINISTRY OF ENVIRONMENT,
PROTECTION OF NATURE AND
SUSTAINABLE DEVELOPMENT

MINISTER'S CABINET

Yaoundé, le 18 AUG 2021

LE MINISTRE

A Monsieur le Directeur Général
d'Afisa Food Industry

BP : 15303 ; Tel : 655 41 44 12

DOUALA

Objet : Termes de référence de l'étude d'impact
environnemental et social sommaire de votre projet de
construction et d'exploitation d'une minoterie dans la zone
portuaire de Douala, Arrondissement de Douala 1er,
Département du Wouri, Région du Littoral.

Monsieur le Directeur Général,

J'ai l'honneur d'accuser réception de votre correspondance ci-dessus
référéncée, me transmettant les termes de référence de l'étude d'impact
environnemental et social sommaire votre projet de construction et d'exploitation
d'une minoterie dans la zone portuaire de Douala, Arrondissement de Douala 1er,
Département du Wouri, Région du Littoral.

L'examen desdits termes de référence a suscité l'observation selon laquelle le
programme des consultations publiques devra être revu afin de respecter le délai
d'information des parties prenantes tel que stipulé à l'article 20 (1) du décret
n°2013/0171/PM du 14 février 2013 fixant les modalités de réalisation des études
d'impact environnemental et social.

Moyennant la prise en compte de l'observation ci-dessus formulée, vos termes
de référence reçoivent mon approbation. Les termes de référence ainsi approuvés
tiennent lieu de prescriptions du cahier de charges stipulées à l'article 17 alinéa 1 de
la Loi n°96/12 du 05 août 1996 portant loi cadre relative à la gestion de
l'environnement.

Je vous rappelle que le rapport de l'étude d'impact environnemental et social
est soumis accompagné de la version électronique sur CD-Rom en fichier PDF.

Veuillez agréer Monsieur le Directeur Général, l'assurance de ma parfaite
considération.



Le Ministre Délégué

Dr. Nana Aboubakar Djillich

ANNEX 3: TERMS OF REFERENCE

	<p>AFISA FOOD INDUSTRY S.A. 8.499x5-499 Zone Portuaire du Cameroun. Base Navale BP 15303 Douala Tél.:+237 6 55 41 44 12 E-mail : info@transafrique.cm Web-site www.transafrique.cm</p>
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**ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL
DU PROJET DE CONSTRUCTION ET EXPLOITATION
DE LA MINOTERIE D'AFISA A LA ZONE PORTUAIRE
DE DOUALA, ARRONDISSEMENT DE DOUALA 1^{ER},
DEPARTEMENT DU WOURI, REGION DU LITTORAL
CAMEROUN**

TERMES DE REFERENCE

Juin 2021

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Chapitre 2 I. INTRODUCTION

Dans le cadre de son implantation au Cameroun, AFISA a acquis deux sites d'environ 03 hectares et 01 ha à la zone portuaire de Douala, pour la construction et exploitation d'une minoterie. Le présent document constitue les termes de référence (TDR) de l'Etude d'Impact Environnemental et Social (EIES) du projet d'AFISA à Essengue, arrondissement de Douala 1^{er}, département du Wouri, Région du Littoral

Ces Termes De Référence définissent aussi bien l'objet que l'étendue de la mission qui sera confiée au consultant chargé de la réalisation de l'EIES.

Son élaboration s'inscrit en droite ligne des exigences du décret N°2013/0171/PM du 14 février 2013 fixant les modalités de réalisation des études d'impact environnemental et social, et son contenu conformément à l'arrêté 0001/MINEP du 13 février 2007 définissant le contenu général des termes de référence des études d'impact environnemental.

I.1 But des Termes De Référence (TDR)

Les présents Termes de Référence (TDR) ont pour but de guider l'étude d'impact environnemental et social préalable aux travaux de construction et d'exploitation d'une minoterie. Ils visent à prescrire les grandes lignes suivant lesquelles l'étude d'impact environnemental sera réalisée, notamment de donner au consultant un cadre de référence couvrant l'ensemble des préoccupations environnementales, socio-économiques associées à l'existence et au fonctionnement de cette ferme. Ils répondent aussi à une démarche de mise en conformité par rapport à la réglementation nationale en vigueur au Cameroun.

L'étude quant à elle vise à évaluer les incidences directes ou indirectes des activités dudit projet sur l'équilibre écologique de la zone d'implantation ou de toute la région, le cadre et la qualité de vie des populations et sur l'environnement en général afin d'assurer son insertion harmonieuse dans son milieu d'accueil.

I.2 Type de projet et ou d'Etude d'Impact à réaliser

La loi-cadre relative à la gestion de l'environnement au Cameroun, dispose en son article 17 (1) que « *le promoteur ou le maître d'ouvrage de tout projet d'aménagement, d'ouvrage, d'équipement ou d'installation qui risque, en raison de sa dimension, de sa nature ou des incidences des activités qui y sont exercées sur le*

milieu naturel, de porter atteinte à l'environnement est tenu de réaliser, selon les prescriptions du cahier des charges, une étude d'impact permettant d'évaluer les incidences directes ou indirectes dudit projet sur l'équilibre écologique de la zone d'implantation ou de toute autre région, le cadre et la qualité de vie des populations et des incidences sur l'environnement en général.» Par conséquent, ce projet est soumis à la réalisation d'une Etude d'Impact Environnemental et Social.

L'arrêté 0001/MINEPDED du 08 Février 2016 fixant les différentes catégories d'opérations dont la réalisation est soumise à une évaluation environnementale stratégique ou à une étude d'impact environnemental et social en son article 5 (IV-G-a) classe le projet d'usine de farine dans la catégorie de l'étude d'impact environnemental et social sommaire. L'étude d'impact environnemental et social sommaire a retenu notre attention.

I.3 Présentation du promoteur du projet

AFISA est une entreprise de production de la farine est basée à la zone portuaire de Douala et qui a pour ambition d'étendre ses activités.

Sa fiche d'identification est la suivante :

- Raison sociale : AFISA
- Régime social : S.A.
- N° du RCCM : RC/DLA/2018/M/4572
- N° de contribuable : M01152248434E
- Directeur Général : Monsieur DJOFANG Cyrille
- Nombre d'emplois au démarrage : 150

I.4. Nature du projet

Le projet qui fait l'objet de la présente étude est celui de la construction et de l'exploitation d'une minoterie (usine de production de farine) dans le village Essengue, zone portuaire, arrondissement de Douala 1^{er}, Département du Wouri. Il s'agit plus précisément de construire des bâtiments d'usine et d'administration, équiper les espaces techniques en machines, approvisionner en matières premières et lancer la production.

I.5 Procédures d'attribution de l'étude

L'étude d'impact environnemental et social du projet de construction et d'exploitation de l'unité d'usine, sera faite par un consultant, cabinet/ONG sélectionné par AFISA, sur la base de la liste des bureaux d'études /ONG

agréés par le Ministère de l'Environnement, de la Protection de la Nature et du Développement Durable (MINEPDED).

La procédure d'attribution du marché respectera non seulement la réglementation en vigueur au Cameroun, mais aussi les exigences des bailleurs de fonds, en matière de sélection des prestataires.

Chapitre 3 II. CONTEXTE

II.1 Contexte juridique

Au Cameroun, les unités de production sont encadrées par les lois et décrets d'applications. Nous donnons dans les lignes suivantes quelques-uns qui peuvent servir de socle pour le consultant en charge de l'EIES.

- La loi N° 96/012 du 5 août 1996 énonce en son article 17 que « Le promoteur ou le maître d'ouvrage de tout projet d'aménagement, d'ouvrage, d'équipement ou d'installation qui risque, en raison de sa dimension, de sa nature ou incidences des activités qui sont exercées sur le milieu naturel, de porter atteinte à l'environnement, est tenu de réaliser, selon les prescriptions du cahier des charges, une étude d'impact permettant d'évaluer des incidences directes ou indirectes dudit projet sur l'équilibre écologique de la zone d'implantation ou de toute autre région, le cadre et la qualité de vie des populations et des incidences sur l'environnement en général ».
- La Loi 98/015 du 14 juillet 1998 relative aux établissements classés dangereux, insalubres ou incommodes ;
- La loi n° 98/20 du 24 décembre 1998 régissant les appareils à pression de gaz et à pression de vapeur d'eau ;
- Loi n°2019/024 du 24 décembre 2019 portant Code General des Collectivités Territoriales Décentralisés ;
- Loi N°77/11 du 11 juillet 1977 portant réparation et prévention des accidents de travail et maladies professionnelles ;
- Loi N° 92/007 du 14 août 1992 portant Code du Travail. Cette loi régit les rapports entre les travailleurs et l'employeur ainsi qu'entre les apprentis placés sous leur autorité.
- Loi N° 77/11 du 13 Juillet 1977 portant réparation et prévention des accidents de travail et maladies professionnelles.

Les textes d'application des différentes lois :

- Le décret N° 2013/0171/PM du 14/02/2013 fixant les modalités de réalisation des études d'impact environnemental et social, précise les modalités d'application de la loi n° 96/012 suscitée. C'est ainsi qu'il exige le dépôt des termes de référence pour la réalisation d'une étude d'impact environnemental auprès des administrations compétentes.
- Arrêté n°0001/MINEPDED du 08 Février 2016 fixant les différentes catégories d'opérations dont la réalisation est soumise à une étude d'impact environnemental.
- Arrêté n° 001/MINEPDED/ du 15 octobre 2012 fixant les conditions d'obtention d'un permis environnemental en matière de gestion des déchets ;

- Arrêté n° 0001/MINEP du 13 février 2007 définissant le contenu général des termes de référence d'une étude d'impact environnemental ;
- Arrêté n° 0010/MINEP/ du 03 Avril 2013 portant organisation et fonctionnement des Comités Départementaux de suivi de la mise en œuvre des plans de gestion environnementale et sociale.
- Décret N° 99/818/PM du 9 Novembre 1999 fixant les modalités d'implantation et d'exploitation des établissements classés dangereux, insalubres ou incommodes.
- Décret N° 93/720/PM du 22 Novembre 1993 fixant les modalités d'application de la loi N° 90/031 du 10 Août 1990 régissant l'activité commerciale au Cameroun.
- Décret N°2015/1373/PM du 08 juin 2015 fixant les modalités d'exercice de certaines compétences transférées par l'État aux communes en matière d'environnement.

Dans le présent décret, l'État transfère aux communes les compétences suivantes en matière d'environnement :

- Le suivi et le contrôle de la gestion des déchets industriels ;
- La protection des ressources en eaux souterraines et superficielles.
- Décret N° 2011/2583/PM du 23 août 2011 Portant réglementation des nuisances sonores et olfactives.
- Décret N°2011/2583/PM DU 23 août 2011 fixant les modalités de protection de l'atmosphère.
- Décret N° 2012/2809/PM du 26 septembre 2012 fixant les conditions de tri, de collecte, de stockage, de transport, de récupération, de recyclage, de traitement et d'élimination finale des déchets.
- Décret N°2008/0737/PM du 23 avril 2008 fixant les règles de sécurité, d'hygiène et d'assainissement en matière de construction
- Décret N°2008/0740/PM du 23 avril 2008 fixant le régime des sanctions applicables aux infractions aux règles d'urbanisme.

II.2 Contexte institutionnel

Les administrations prioritairement concernées par cette étude sont :

- Le Ministère de l'Environnement, de la Protection de la Nature et du Développement Durable (MINEPDED) qui a la responsabilité d'élaborer et de planifier la politique nationale en matière de gestion de l'environnement.
- Le Ministère des Mines, de l'Industrie et du Développement Technologique

(MINMIDT)

- Le Ministère du Travail et de la Sécurité Sociale (MINTSS) ;
 - Le Ministère du Domaine, du Cadastre et des Affaires Foncières (MINDCAF) ;
 - Le Ministère du Commerce (MINCOMMERCE) ;
 - La collectivité territoriale décentralisée (Commune de Douala 1^{er})
 - Des organisations de défense de l'environnement et de la protection de la nature,
- ...

Le Consultant tiendra compte de toutes ces parties prenantes dans la planification et la tenue des consultations publiques.

II.3. Localisation administrative et géographique du site du projet

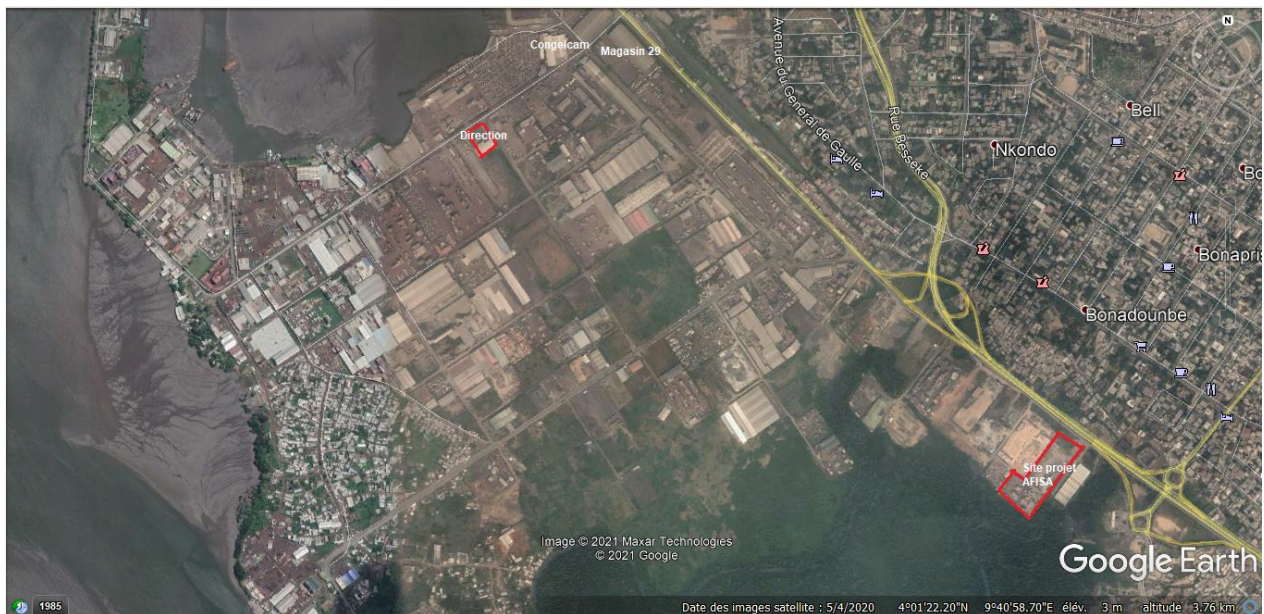


Figure 11: Localisation des sites d'AFISA à la zone portuaire

II.4. Contexte environnemental

Le projet se trouve en zone urbaine de Douala qui est une ville cosmopolite en expansion, avec un tissu d'activités diverses (industrielles et humaines) qui se développent à un rythme soutenu. Il est impératif d'évaluer et d'étudier l'impact des activités de ce projet sur cet environnement périurbain. Cette analyse sera faite au niveau des éléments qui composent l'environnement du projet à savoir :

- **Le sol** ou il sera question d'évaluer l'impact de ce projet de construction et de rénovation des installations sur la structure, la texture et la composition du sol ;

- **Les ressources en eau**, ou il sera question d'inventorier ces ressources et faire un lien avec les sources potentielles de leur contamination, pour mieux évaluer leur impact sur lesdites ressources ;
- **L'air** : pour cette composante, il sera procédé à l'inventaire des émissions (fumées, poussières), et autres matières qui seront rejetées dans l'air lors de la phase de fonctionnement du projet, pour évaluer les impacts possibles ;
- **La biodiversité** est riche et diversifiée dans le département du Wouri. Il sera procédé à l'identification de la faune et de la flore des sites choisis pour le projet se retrouve dans le quartier Essengue de Douala ;
- **La composante socioéconomique**, il sera réalisé des enquêtes lors de la phase des études, puis des consultations publiques, pour évaluer toutes les nuisances

Dans le cadre de ce travail, le consultant doit chaque fois intégrer dans l'analyse, les aspects genre, Covid-19 et le VIH SIDA en rapport avec le projet au niveau de la composante socioéconomique.

II.5. Contexte socio-économique

Le projet de AFISA va s'implanter dans la zone portuaire et particulièrement au quartier Essengue à Douala dans le département du Wouri. Même si les sites choisis sont dans la zone à activité industrielle et administrative, nous ne négligerons pas la présence d'habitations et le caractère expansif de la ville de Douala qui impose de prendre des précautions nécessaires pendant les études pour pouvoir intégrer les meilleures techniques d'atténuation des nuisances (poussières et bruits), ainsi que des pollutions sur l'environnement immédiat et sur un rayon de 100m.

Chapitre 4 III. OBJECTIF ET PORTEE DE L'ETUDE

III.1 Objectif

Le projet qui fait l'objet de la présente étude est celui de la construction et de l'exploitation d'une minoterie (usine de production de farine) dans le village Essengue, dans l'arrondissement de Douala 1^{er}. L'objectif de l'étude d'impact environnemental et social est de déterminer les impacts positifs et/ou négatifs liés à l'activité desdites unités sur l'environnement biophysique et d'atténuer, de compenser ou de minimiser les impacts négatifs et d'en bonifier les impacts positifs.

III.2 Description du projet et des activités

Le projet d'AFISA consiste en la production et à l'exploitation d'une unité de production de farine de blé d'une capacité de 1000 tonnes par jour. Le blé nécessaire pour la production de la farine est importé des pays tels que l'Allemagne, la France, Le Canada, l'Ukraine et la Russie. Ce projet va engendrer 150 emplois directs et favoriser des partenariats avec d'autres entrepreneurs, notamment pour la fourniture des sacs laminés, qui sont utilisés pour emballer la farine. La source d'énergie électrique utilisée est deux groupes électrogènes et ENEO par contre la source hydraulique utilisée est l'eau potable de la Camwater. Le projet sera réalisé sur un site situé dans la zone industrielle du port de l'arrondissement de Douala 1er. Ce site s'étend sur une superficie d'environ 3 hectares.

Sur le site, il est question de construire :

- Un magasin sur un entrepôt sur superficie de 4 400m² ;
- Quatre silos d'une capacité de 5 000 tonnes chacun;
- Une usine de production en métal;
- Deux parkings (visiteurs et personnel) ;
- Des bureaux ;
- Un atelier de travail ;
- Une guérite, une cantine ;
- Un vestiaire ;
- Un réservoir d'eau ;
- Une salle de pompage d'eau potable ;
- Un pont bascule ;
- Une salle de commande électrique.

Outre les infrastructures construites, il est aussi question de végétaliser le site en aménageant des espaces verts.

III.2.1. Phase d'aménagement et ouverture des voies d'accès

TRAVAUX D'AMÉNAGEMENT

Les travaux d'aménagement s'articuleront autour du :

- Désherbage, dessouchage et le nettoyage des sites ;
- Terrassement (déblai et remblai) ;
- Régilage et compactage du terrain ;

Ces travaux seront réalisés à la fois par les populations qui abattent les arbres et les

engins de BTP qui feront les travaux de terrassement et de nettoyage du site.
Ces travaux comprennent l'installation du chantier et les terrassements généraux.

INSTALLATION DU CHANTIER

Sont regroupés dans ce paragraphe, tous les travaux préparatoires au démarrage de la construction de l'édifice.

III.2.2. Phase de construction des bâtiments

Les travaux associés à cette phase sont : l'étape des travaux préparatoires et l'étape de construction proprement dite.

➤ Construction des Bâtiments

Les bâtiments, aux standards seront construits selon les règles de l'art du BTP. Ce sont :

- Le Bâtiment administratif
- Le Bâtiment d'usine.

Les bâtiments seront construits dans la stricte conformité du plan d'implantation de l'architecte. Toutes les dispositions précisées au mémo descriptif et sur les plans devront être respectées.

III.2.3. Installation et montage des machines et équipements

Il sera question, après les constructions de :

- Transporter les équipements et machines sur le site des constructions,
- Installer les machines et équipements,
- Tester la fonctionnalité et la fiabilité,
- Mettre en service les unités.

Equipements utilisés

Pour assurer le fonctionnement des installations et la production de la farine de blé, le promoteur vise à utiliser comme équipements :

- Deux groupes électrogènes d'une capacité de 1000 KA chacun ;
- Une chaudière :
- 04 silos (5000 tonnes par silos) en tôles d'acier galvanisés ;
- Des silos (100 tonnes par silos)
- Des installations électriques (postes de transformations, câbles, armoires électriques etc.)
- Des installations hydriques (un réservoir d'eau et une pompe hydraulique)

- Deux lignés de moulins (500t par moulin) constitués d'appareils à cylindre et des rouleaux en inox
- Des ensacheuses;
- Des véhicules de service et de livraison ;


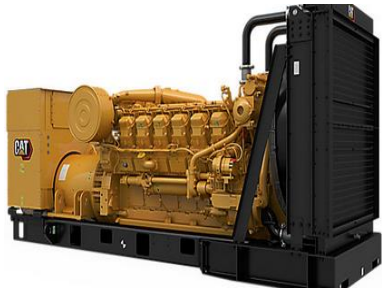


Silos à fond conique

Il a un diamètre généralement plus petit que ceux à fond plat et est d'une hauteur maximale de 12 mètres pour une capacité de 3450 mètres cubes. Le silo à fond conique est assigné à de nombreuses applications industrielles. Il permet l'entreposage de produits fragiles, pouvant être affectés dans un processus de déchargement. Ce type de silo nécessite une construction particulière. Le fond est construit différemment du silo à fond plat, afin de diminuer son poids, ce qui permet d'élever le fond par rapport au sol. Ainsi, le produit stocké est isolé du sol, ce qui empêche l'humidité d'entrer et préserve le produit. L'accent est également mis sur la ventilation. Il est utilisé dans le cadre de ce projet pour le stockage des grains de blé.

Moulins

Un moulin est une machine à moudre, à l'origine avec une ou plusieurs meules, principalement les grains de céréales récoltés afin de les transformer en poudre plus ou moins grossière ou farine. Le broyage se fait par une action d'écrasement et de friction: il ouvre le grain et gratte l'enveloppe. Le claquage, autre appareil à cylindre, va réduire les semoules en farine. Les grains broyés sont ainsi transformés en farine grossière, qui est expulsée, par la force centrifuge, à l'extérieur des meules, directement sur le plancher.

Tableau : équipements utilisés

Nom et marque	Caractéristique	modèles
Silos de stockage des aliments	Forme conique Hauteur : 5-12 m Volume : 3650 m ³ Masse : 5000 tonnes	
Groupes électrogènes	Type : CAT Puissance : 1000 kVa Vitesse de rotation 1500 tr/min Capacité du réservoir 1000 Litres Fréquence : 50 Hz Démarrage automatique en option Faible consommation de carburant	
Pompe hydraulique	Marque Flygt Q : 25 m ³ /h H : 37 mCE	
réservoir d'eau	Réservoirs surélevés En Béton armé Alimenté par pompage Épaisseur de la tranche d'eau 3-6 m hauteur 2 - 3m	

ensacheuses	<p>Capacité : 25- 50 Kg Mâchoires serre-sacs à fermeture automatique Châssis très robuste mécanosoudé en acier peint époxy Toutes les parties en contact avec le produit sont en inox</p>	
Moulin	<p>Broyeur pour la farine au blé complet 400 Kg/h grossièrement moulu et 250 kg/h finement moulu</p>	

Le procédé utilisé par AFISA reprend à son compte les méthodes traditionnelles de préservation, au travers des moyens sophistiqués, la culture et l'histoire de la mouture du blé. Ce procédé s'articule sur les phases suivantes :

III.3. RECEPTION DES MATIERES PREMIERES

Cette étape comprend le déchargement du blé réceptionné au port dans des camions, selon deux modes différents, à savoir le déchargement par grue et par aspiration.

A l'arrivée du blé dur aux moulins, les camions passent par le pont bascule où la quantité reçue sera pesée puis versée dans une trémie. Cette dernière est couverte d'une grille en acier de 25 mm d'ouverture pour retenir les grosses impuretés telles que cailloux, bois, paille, etc. La trémie est protégée par un toit contre les intempéries et en mesure de recevoir un camion entier de 30 tonnes. Ensuite, le blé est transmis vers les silos de stockage par le biais des transporteurs et des élévateurs à godets.

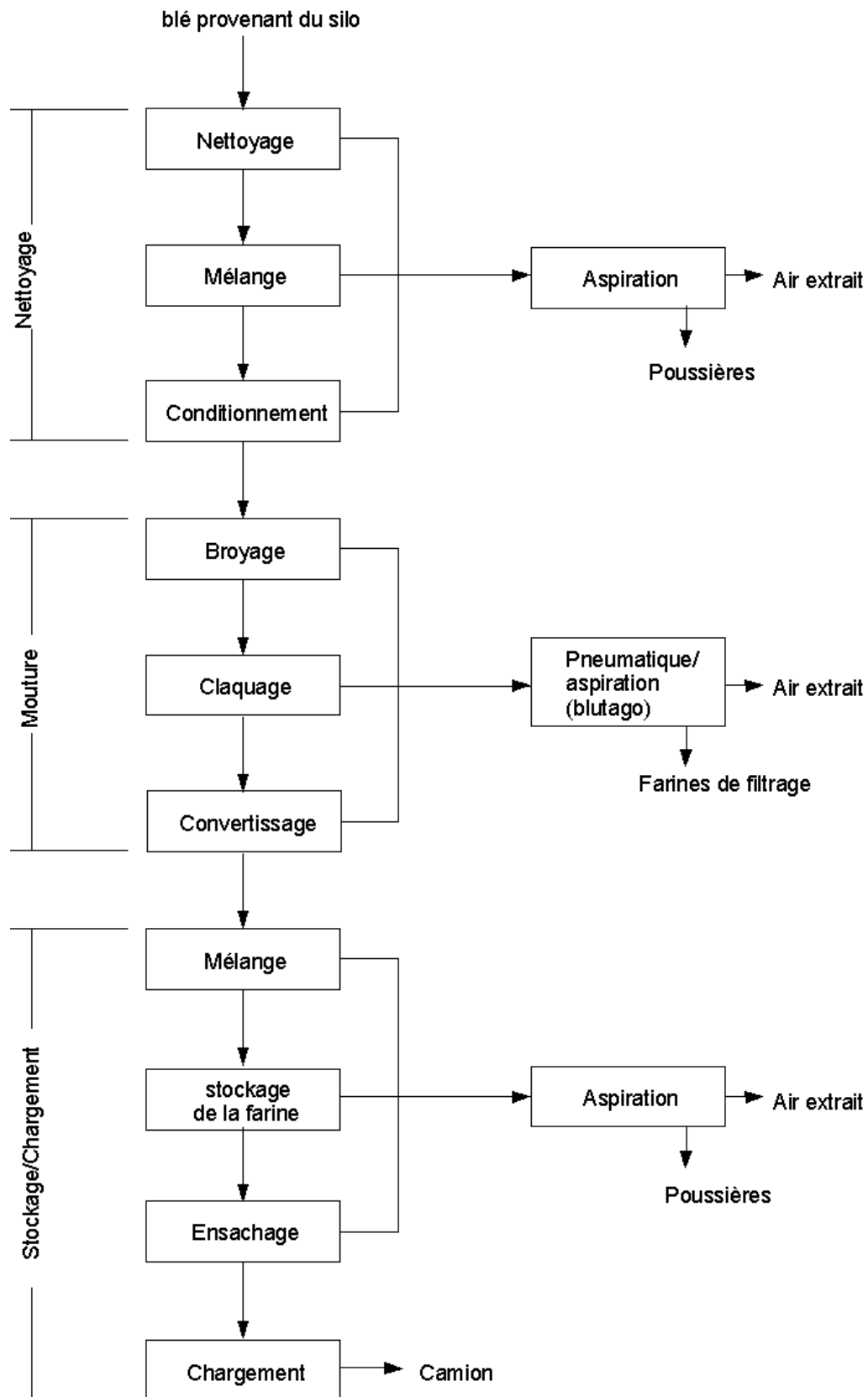


Figure 12- Schéma de fonctionnement d'une minoterie à blé

III.3.1. Réception de la matière première

La réception de la matière première se fait par voie routière à l'aide des camions en vrac, le contrôle quantitatif de blé s'effectue au niveau d'un pont bascule de capacité de 80 tonnes situé à l'entrée du moulin.

Après la pesée, le blé est dirigé vers l'une des trémies de réception de 100T/h. Cette dernière est protégée par une grille métallique pour éliminer les grands déchets, située entre le moulin et les silos de stockage.

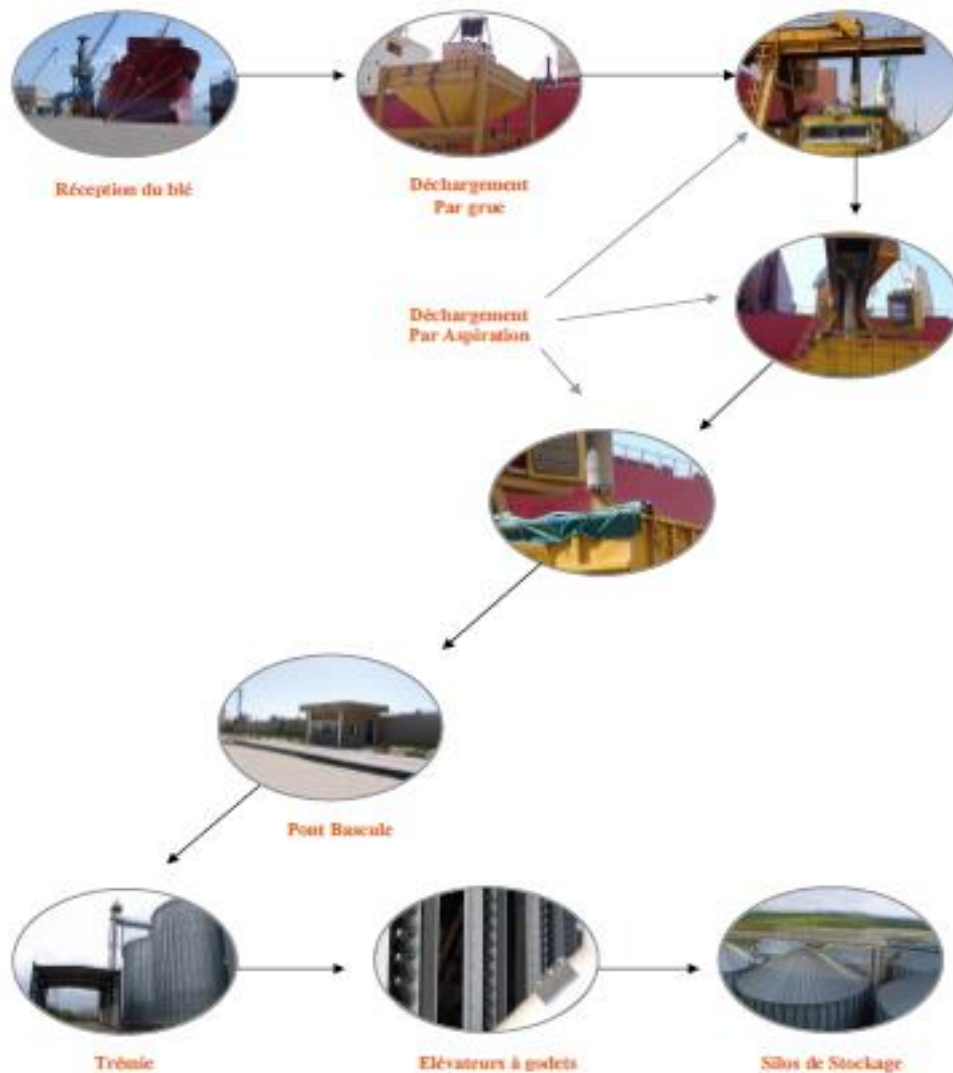
Avec des élévateurs (transporteurs mécaniques), le blé se transporte vers la section pré nettoyage, ensuite soit il se dirige vers les silos de stockage de capacité 10000 quintaux x 8 soit vers des cellules de mélange.

III.3.2. Pré nettoyage

Le pré nettoyage a un rôle important pour la conservation du grain, cette opération a pour but d'éliminer les grosses impuretés et une partie de la poussière ainsi les fins déchets dans le blé réceptionné. Cette étape est très importante pour la préparation de blé au nettoyage, elle comprend les équipements suivants :

- Une trémie de réception qui élimine les grands déchets, avec un transporteur à chaîne lié par un élévateur à godet ;
- Un séparateur magnétique ;
- Deux séparateurs nettoyeurs, aspirateurs.

Après le déchargement dans la trémie de réception, le blé est repris par un transporteur à chaîne celui-ci l'amène vers l'élévateur à godet ensuite le blé dévie vers le distributeur, ce dernier distribue le blé sur les cellules d'attente ou directement il subit l'opération de pré nettoyage.



Par la suite, le blé dans l'étape de pré nettoyage passe par plusieurs équipements :

III.3.2.a. Séparateur magnétique

Appelé aussi aimant, il a un rôle fort simple, il élimine les particules et les éléments ferreux que peut contenir les blés. On place en tête du circuit du nettoyage pour éviter et limiter les risques et les dégâts qui peuvent produire une étincelle dans une atmosphère chargée de poussières, aussi on limite les risques d'explosions.

On place le séparateur magnétique également avant l'arrivée du blé au niveau du premier broyeur pour s'assurer de l'élimination des particules ferreux de blé lors de passage en mouture.

Après cet équipement le blé se distribue sur deux séparateurs nettoyage-aspirateur.

III.3.2.b. Séparateur-nettoyage-aspirateur (S.N.A)

Après l'aimant, le blé se dirige vers les deux séparateurs qui assurent l'opération de nettoyage qui ont une capacité de 50 T/h, on décrit le séparateur nettoyeur aspirateur comme suit :

- ✓ L'entrée du produit : un tuyau en fer fixé directement sur le châssis par un bête est relié à la tuyauterie avec un anneau au centre porte tamis moyennant un manchon flexible en caoutchouc.
- ✓ Dispositif de distribution : son rôle est de distribuer uniformément le produit sur toute

la longueur du tamis.

- ✓ Cadre porte tamis : il est muni d'un mouvement oscillatoire, imprimé par l'arbre à cames les contres poids assurent la stabilité de la machine contenant les guides d'alignement des tamis de récolte produit.
- ✓ Tamis : il y a deux types :
 - Un tamis supérieur à grandes perforations d'environ 6 mm de diamètre, de forme oblique, le tamis laisse passer le blé et refuse les gros déchets.
 - Un tamis inférieur à petite perforations d'environ 2 mm, il refuse le blé et laisse passer les déchets fins tels que le sable...etc.
- ✓ Chambre de séparation : elle est divisée en canaux pour un nettoyage efficace du produit sur longueur de la machine, elle sert à nettoyer grâce à l'aspiration à ce niveau.

On aura trois types de déchets :

- Déchets légers aspirés éliminés par aspiration ;
- Déchets gros et le sable éliminés par les tamis ;
- Déchets ferreux éliminés par l'aimant.

Après le passage du blé par les deux séparateur-nettoyeur-aspirateur l'équipement qui suit est le tarare :

III.3.2.c. Tarare

C'est un équipement qui est inséré dans la section pré nettoyage ainsi dans la section nettoyage, il sert à éliminer les impuretés les plus légères que le blé. Le produit est introduit en partie inférieure arrière de la machine dans un tiroir vibrant. Le réglage de flux d'air est très important afin d'être sûr d'enlever un maximum d'impuretés qui sont récupérées dans la chambre interne de la machine et précipités puis extraites à l'aide d'une vis sans fin.

Au niveau de cette section après l'opération de pré nettoyage, le blé est repris à l'aide des électrovannes au-dessus et en dessous soit vers des silos et des cellules de mélange soit vers la section du premier nettoyage et premier conditionnement.

III.3.3. Processus de nettoyage

Durant l'opération de pré nettoyage les séparations sont plutôt superficielles visant essentiellement à enlever le plus gros lot de poussière et des impuretés, même après cette opération le blé contient encore des impuretés. La céréale peut aussi être contaminée par des insectes ou des excréments de rongeurs. En effet, les grains sont couverts de poussière et de saleté, le pourcentage d'impuretés oscille normalement entre 1 et 3%. C'est pour cela que vient l'étape du premier nettoyage et premier conditionnement.

Le premier nettoyage débute à partir des extracteurs doseur des cellules de mélanges à blé sale. En quittant des cellules de mélange, le blé est transporté par une vis sans fin vers l'élévateur à godets qui le transporte jusqu'au quatrième étage ensuite il tombe dans une vis sans fin qu'il achemine vers un aimant afin d'éliminer les déchets métalliques, le blé est pesé par une balance 10T/h. une fois que le blé est pesé, il traverse le séparateur nettoyeur aspirateur qui est combiné avec un canal d'aspiration. Par la suite la matière première traverse un épierreur puis une brosse décortiqueuse époinçonneuse puis un canal d'aspiration. A l'aide d'un élévateur le bon blé est transporté vers l'humidificateur automatique et continue son chemin vers la vis sans fin mouilleuse (inclinée) avec deux électrovannes le blé se distribue vers trois cellules de premier conditionnement pour un temps de repos de 24heures.

Pour cette étape (premier nettoyage et premier conditionnement) on prévoit un ensemble d'équipements pour la réaliser.

III.3.3.a. Séparateur magnétique

C'est une machine qui s'insère dans le diagramme de nettoyage du blé, sa fonction est l'élimination et retient les morceaux métalliques (rondelles, vis, clous, etc.), a pour but d'éviter des ruptures des machines voire des explosions.

En effet, un corps ferreux qui passe par les machines peut se surchauffer et, en contact avec la poussière/son/germe du grain, peut provoquer une explosion.

La séparation de ces matériaux se fait par des séparateurs à aimants qui sont placés à différents points de la section de nettoyage : en particulier, immédiatement après la balance de contrôle, avant les nettoyeurs à grains, et avant l'envoi du grain à la mouture.

III.3.3.b. Séparateur nettoyeur aspirateur S.N.A

Cet équipement travaille par le principe de tamisage, il exploite le phénomène des différences dimensions entre les particules qui consistent à séparer les impuretés dont les dimensions sont inférieures (sable, parasites végétaux, plantes, céréales fourragères) et supérieures (différentes céréales, haricots, paille, impuretés grossières, etc.) que le grain de blé.

Cette appareil se compose de deux tamis légèrement incliné et muni d'un mouvement de vas et viens, le tout se complète par une forte aspiration pour le débarrasser des bulles de la poussière et d'autres impuretés légères.

- Le tamis principal : dont les dimensions des ouvertures de mailles de 6 mm de diamètre, laisse passer le blé et refuser les déchets plus gros que le blé.
- Le tamis à sable : dont les dimensions des ouvertures de mailles de 2 mm de diamètre, laisse passer les impuretés fines et refuse le blé.

III.3.3.c. Epierreur

C'est un équipement qui sert à séparer d'une façon continue les pierres et les matières dont la forme et les dimensions peuvent être celles de blé mais qui sont d'un poids spécifique différent. C'est une machine entièrement fermée travaillant en dépression (la pression de l'épierreur est inférieure à la pression atmosphérique). Elle est constituée essentiellement d'une construction métallique et plan de travail incliné ce qui est composé d'un cadre sur le quelle est fixée une plaque de triage en tissus métallique à mailles série interchangeables.

Sous l'effet du mouvement oscillant et du courant d'air aspiré par le ventilateur qui parvient sur le plan par le canal d'aspiration placé sur la hotte d'aspiration, le courant d'air traverse le produit de bas en haut ; la fraction légère se trouve ainsi sur le dessus et les impuretés lourdes se disposent sur la partie inférieure (contact avec le tamis). La couche inférieure ou se trouve également les pierres s'écoulent vers le haut, le produit ainsi épierré est porté par des coussins d'air d'écoulement lentement vers la sortie de produit situé à la partie inférieure.

Le réglage de cette machine se fait comme suit :

- Il faut régler la fréquence des vibrations et leurs amplitudes ;
- Il faut choisir les perforations de la tôle du cadre ;
- Il faut régler l'effet de suspension de l'air qui traverse le blé ;
- Il faut régler l'inclinaison des plans de travail.

III.3.3.d. Batterie de triage

Ce sont des trieurs à manteau alvéolé, son travail consiste à exploiter les différences de forme et de dimension. Ils sont constitués d'une tôle en acier cylindrique comportant sur sa surface interne les alvéoles.

- Trieur à grain rond (TGR) : travaillé avec des alvéoles 5.5 mm, son rôle est d'extraire les grains ronds et refuser les grains de blé et les grains longs ;
- Trieur à grain long (TGL) : travaillé avec des alvéoles d'environ 10 mm, le rôle de TGL est d'extraire le blé et refuser les grains longs ;
- Trieur de reprise à grains ronds : il est alimenté par les grains ronds extraits du TGR, le rôle de ce dernier est de séparer le blé assemblé avec les grains ronds.

III.3.3.e. Brosse décortiqueuse épointeuse

Après l'étape du triage, le blé subit le traitement de brossage (frottement), ce traitement a pour but d'enlever et détacher la terre et la poussière qui peut adhérer à la surface du blé. Elle enlève aussi la barbe du blé et les grains infestant. Elle assure aussi le nettoyage de sillon.

Cette machine est de construction entièrement métallique constitue le manteau de tamisage, elle est subdivisée en deux parties disposées horizontalement et comprend le rotor à batteur avec mouvement de rotation.

III.3.3.f. Canal d'aspiration

Cette machine a pour rôle de séparer les céréales, les particules d'enveloppe et les impuretés légères. Elle comprend comme élément essentiel :

- Une alimentation avec moteur vibreur (caisse d'alimentation) longitudinal ;
- Parois postérieures réglables ;
- Dans le canal d'aspiration, l'alimentation se compose d'une caisse avec un patin (sabot) d'alimentation oscillant librement, il est suspendu à des blocs de

caoutchouc (pour éviter les frottements) et à des ressorts (pour régler la hauteur entre les patins).

- Le moteur vibreur commande le patin et le fait vibrer horizontalement, simultanément et par la suite du poids de produit. La fonte de vidange s'ouvre suffisamment pour obtenir un voile de produit régulier sortant horizontalement sur toute la largeur de canal.
- Le volant permet de régler le débit d'air et commande le déplacement de la partie supérieure de la paroi postérieure et un autre volant commande la partie inférieure de la paroi postérieure.

III.3.4. Etapes de conditionnement

Après avoir débarrassé le blé d'une forte teneur en proportion des impuretés, il est transporté à l'aide d'un élévateur vers l'humidificateur automatique puis vers la vis mouilleuse (inclinée) pour une nouvelle étape qui est le conditionnement.

Le terme conditionnement signifie couramment un traitement des grains par une combinaison de l'humidité plus le temps de repos des grains mouillés. Dont le but est de modifier leurs caractéristiques physiques et de faciliter leur réduction en farine aussi de permettre aux opérations mécaniques de la mouture d'être le plus efficace possible.

Donc le but de conditionnement est :

- D'assouplir les enveloppes pour ne pas qu'elle se brise en fines particules lors de la phase

de broyage ;

- Ramollir l'amande de telle sorte qu'elle se fragmente durant les processus de la mouture;
- Faciliter la séparation des enveloppes grâce à la diffusion rapide de l'eau ;
- Permettre de diminuer les dépenses énergétiques car le blé moulu sec consomme une énergie très élevée ;
- Obtenir un produit fini de bonne qualité ;
- L'addition de l'eau se fait dans un humidificateur automatique qui assure la bonne répartition de l'eau dans un lot de blé puis il passe dans une vis mouilleuse dont le but est de continuer l'opération de l'humidification.

Le conditionnement se fait en deux étapes :

- Premier conditionnement puis repos dans les trois cellules pendant 24 heures, la qualité d'eau nécessaire au blé est en fonction de sa nature et son humidité

initiale ainsi l'humidité de la farine désirée. C'est pourquoi on utilise le mouilleur automatique où il suffit de faire une vérification de l'étalonnage de temps, puis une vis mouilleuse. A ce niveau on ajoute 2/3 de la quantité d'eau en utilisant la formule suivante :

$$X = Q \frac{H_f - H_i}{100 H_f}$$

X : la quantité d'eau ajouté /pesée ;

H_f : humidité finale ;

H_i : humidité initiale ;

Q : débit de blé en kg/h à conditionner

- Deuxième conditionnement puis repos dans les deux cellules pendant 12 heures, dans cette étape à l'aide des doseurs qui se trouve au niveau des cellules du premier conditionnement. On transporte le blé vers une autre vis mouilleuse par une vis sans fin et un élévateur à godet dans le but de rajouter 1/3 d'eau puis le blé transporté vers les cellules de repos.

III.2.5. Deuxième nettoyage

Le deuxième nettoyage se fait par deux machines :

Une brosse: le produit entre par l'orifice d'entrée ou se trouve immédiatement en contact avec les batteurs de rotor qui commencent à l'agiter et à l'entraîner vers la sortie pendant tout le parcours, le produit subit une action de battage provoquée par les batteurs. Un frottement en contact avec le manteau collecte tous les déchets passés à travers le manteau même.

Un trieur optique : Principe du triage optique

1. Trémie de chargement
2. Plaque d'alimentation vibrante
3. Glissière inclinée
4. Caméras RGB Full-Colorimétrie
5. Caméras additionnelles NIR et/ou InGaAs
6. Ejecteurs
7. Trémie de déchargement du produit conforme
8. Trémie de déchargement des déchets



Figure : Principe du trieur optique

III.3.6. Sections mouture de blé tendre

III.2.6.a. Généralités

Le blé conditionné est transporté jusqu'à la première paire du cylindre de broyage où commence la séparation progressive de l'amande d'enveloppes.

Le but de la mouture est d'ouvrir le grain, de détacher la plus grande quantité possible de l'albumen de l'enveloppe du grain de blé et de réduire progressivement l'amande pratiquement pure en produit fini.

On peut résumer la mouture de blé en deux phases :

- Séparer l'amande farineuse du son et de germe, cette phase est réalisée au cours de broyage
- Réduire cette amande en granule fine qui peut être classé comme farine répondant aux normes et aux besoins des consommateurs, cette phase est réalisée au cours de convertissage et de claquage.

L'opération de la mouture se fait par série d'équipement dont chacun à un rôle spécifique tel que : les appareils à cylindre pour le broyage, claquage et convertissage et les plansichters pour la séparation des différents produits en fonction de leurs dimensions. Les sasseurs pour la séparation des différents produits selon leurs densités.

Où l'effet de ces équipements est complété par les détacheurs et les brosses à son. La mouture de blé tendre permet l'extraction de la farine et des issus.

III.3.6.b. Principales opérations de la mouture

◆ Broyage

Cette phase est la plus importante dans le processus de mouture car elle influe directement la qualité et le rendement de produit fini, c'est la première opération qui s'exerce sur un blé nettoyé et conditionné. Elle consiste à détacher l'endosperme de l'enveloppe sous une forme de particule grosse en évitant de briser le son.

Le but de cette phase est :

- Fragmenter le grain de blé pour faciliter l'extraction de l'amande ;
- Effectuer la meilleure séparation entre l'amande et les enveloppes ;

◆ Blutage

Cette opération est réalisée par des tamis disposés dans les compartiments de plansichter, son but est de classer les produits qui proviennent des appareils de broyage, de convertissage et de réduction suivant les dimensions des différentes particules, il se fait sur une surface blutante en mouvement.

◆ Séchage

Se fait aussi à l'aide des compartiments de plansichter comportant des tamis superposés, c'est une opération qui consiste à achever le blutage et éliminer complètement la farine qui se trouve mélangé aux semoules fines et finaux. L'extraction consiste en la farine. Alors que le refus est envoyé aux sasseurs.

Caractéristiques de plansichter

Le plansichter est essentiellement une série de tamis qui sont disposés en compartiments 3 à 4, chacun d'eux peut contenir 26 même 27 tamis. A Molinos-Granit nous avons 3 compartiments à 26 tamis, l'action de tamisage s'exerce par un mouvement de rotation parallèle au sol.

◆ Sassage

C'est une opération qui sert en particulier à classer les gruaux selon leur densité donc c'est

l'intermédiaire entre le broyage et la première phase de réduction de produits de claquage.

Caractéristique d'un sasseur

C'est un équipement qui a pour fonction de classer les particules de broyage selon leur densité et leur granulation qui permet d'augmenter l'extraction de farine avec une teneur basse en cendres, il y a deux facteurs qui influent sur cette opération : l'aspiration et le mouvement des tamis.

◆ Désagrégage

Il est réalisé à l'aide des appareils à cylindres finement cannelés dont l'objectif est de libérer le plus grand possible d'amande farineuse adhérente aux fragments d'enveloppes et obtenir le maximum de farine pur. En effet, c'est une opération qui complète le processus de broyage situé parallèlement à celui-ci.

◆ Claquage

Cette opération est pratiquée sur des appareils à cylindres lisses suivis de détacheurs. Il sert à réduire progressivement les produits venant du broyage et du sassage en particules fines, moyenne donc production des grains très propres qui sont transformés en farine durant le convertissage, alors que le refus de calquage constitue le remoulage bis.

◆ Convertissage

C'est l'opération finale de la réduction qui consiste à réduire les grains et les finots de broyage et claquage pour extraire le maximum de farine, sa qualité et sa quantité dépendent beaucoup de perfectionnement de ce procédé car la plus grande quantité de farine extraite dans la mouture se fait dans la phase de convertissage environ 40 à 45%, le convertissage est pratiqué à l'aide des appareils à cylindre lisses suivis des détacheurs.

◆ Curage du son

C'est une opération qui consiste à réduire au maximum la quantité d'amande adhérente sur la face intérieure des enveloppes, elle est assurée par des brosses à son alimentées par le refus de tête des derniers broyeurs.

1) La brosse à son

Elle est incorporée dans le diagramme de mouture, elle sert au curage de son ou les enveloppes adhérentes des particules de farine, cette machine se positionne dans la ligne de broyage en sortie de plansichter, son fonctionnement se fait de la façon suivante : le produit arrive en haut niveau de la machine puis à l'aide d'une vis, il est amené vers un disque centrifugeur qui distribue le produit sur la périphérie. Il sert aussi à freiner l'arrivée et permet une répartition homogène des produits dans l'espace de travail, le produit avance grâce à des batteurs fixés sur l'axe qui projettent le produit contre le manteau ce qui sépare la farine du son par le choc.

2) Le vibrofinisseur

Le vibrofinisseur a pour but de traiter le produit venant du filtre et les brosses à son pour extraire la farine, son principe de fonctionnement est analogue à celui de brosse à son avec un changement concernant :

- Les dimensions des perforations ;
- La conception de la machine ;
- La nature du produit entrant dans l'équipement.

3) Le filtre

Il a un rôle de filtrage et de récupération des particules fines portées en suspension par l'air de transport pneumatique ou par celui des installations d'aspirations.

Il est pratiquement utilisé dans un système à aspiration ou dans un système à refoulement, son principe de fonctionnement est basé sur deux phases :

- La phase de filtrage : à ce niveau l'air poussiéreux entre par le bas du filtre et se distribue autour des manches filtrantes, les particules légères (farine, poussière, ...) restent collées à la surface du manche. Par contre les particules légères plus ou moins lourdes tombent en bas dans une trémie de déchargement. L'air filtré purifié sort par le haut pour regagner la chambre d'air épuré, puis il est évacué dans l'atmosphère.
- La phase de dégommage : ou l'air de nettoyage arrive dans un réservoir à air comprimé alimenté par un compresseur, il permet dans les manches de créer une pression supérieure à celle de l'extérieur, l'effet de la plus haute pression intérieure a pour but de :
 - Provoquer un recoussement radical de la manche ;

- Passage de l'air propre à travers la manche filtrante en détachant les particules légères, qui sont accumulés à l'extérieur et qui tombent à la sortie de filtre en passant à travers une écluse qui empêche l'air d'y parvenir.

◆ **Etape de sûreté à farine**

Cette étape est réalisée par un petit plansichter appelle plansichter de sûreté qui sert à éliminer les particules étrangères, ces dernières peuvent se trouvés dans la masse de farine après le stockage comme des éléments métalliques qui peuvent être libérés par des appareils de mouture ou de certaines particules grosses lors de l'usure des tamis à farine ainsi la récupération de certains fragments d'insectes.

III.3.6.c. Nature des produits de mouture

- Farine : elle est constituée par des particules d'amande très fines de blé résultant de sa réduction, on distingue deux farines :
 - Farine panifiable : qui est désignée à la fabrication du pain ;
 - Farine supérieur : qui est désignée à la biscuiterie ...etc.
- Finots et grains : ils viennent de différents passages d'appareils à cylindres, ils sont des produits vêtus similaires ;
- Issus : représentent les particules et les fragments d'enveloppes des grains, on distingue des grains par les sons et les remoulages ;
- Son : constitué par des enveloppes du grain, on distingue deux sortes de son qui sont : son gros, son fins ;
- Remoulage : ce sont des mélanges d'enveloppes plus au moins finement broyé, on trouve : le remoulage blanc et le remoulage bis.

III.3.6.d. Ensilage

La farine entière est un mélange des farines qui provenant du broyage, claquage et convertissage, les diverses farines sont conduites vers les boisseaux appelés les chambres à farines.

III.3.6.e. Maturation des farines

La maturation est un terme qui englobe la succession d'un phénomène qui permet à un système physique ou biologique d'atteindre un complet développement, pour les farines il s'agit des diverses transformations qui les amèneront mais ce n'est à leurs

optimum qualitatif du moins à un niveau tel que leur emploi ne posera aucun problème particulier aux utilisateurs, cette évolution devra se réaliser dans un temps quelques jours à quelques semaines après la mouture.

III.3.6.f. Ensachage

En fin de cycle de mouture, le produit fini sera stocké dans les chambres à farines de capacité de 240 tonnes à leurs sorties le produit fini passe par des balances de différents poids : 1kg, 5kg, 25kg pour les farines supérieures. 25kg, 50kg pour les farines panifiables.

III.3.6.g. Stockage des produits finis

1. Stockage de la farine : après l'opération de l'ensachage, le produit sera soit stocké dans un hangar de grande capacité 150 tonnes, ou il sera transporté directement aux plusieurs points de vente soit sera transporté par des camions aux clients de l'unité.

2. Stockage de son : les sons issus sont des produits finis outre que la farine tel que le son fin et son gros, le remoulage, ils mélangent dans des canalisations et transportés vers des chambres à son, on l'extrait des cellules de stockage pour le chargement dans les camions.

III.3.7 Phase d'abandon et fermeture

En cas d'abandon du projet ou de fermeture des installations par le promoteur, les actions suivantes seront envisagées :

- Les formalités administratives ;
- Le démantèlement des équipements ;
- La liquidation des avoirs ;
- La cession à un tiers ou reprise par un autre exploitant sur le site ;
- La remise en état du site.

Les impacts de ces activités seront décrits, analysés et caractérisés par le consultant.

Chapitre 5 IV. MISSION DU CONSULTANT

IV.1 Missions assignées au consultant

Les activités prévues dans le cadre du projet pendant la phase d'aménagement et pendant la phase d'exploitation étant des sources potentielles d'impact, le consultant devra réaliser l'étude d'impact environnemental et social (EIES) du projet c'est-à-dire :

- Décrire l'état biophysique et socioéconomique initial du site ;
- Décrire les activités du projet source d'impact ;
- Identifier, caractériser et évaluer les impacts potentiels des activités du projet sur les composantes biophysiques et socioéconomiques du site et de sa zone d'influence ;
- Proposer des mesures d'atténuation ou de compensation des impacts pour une gestion écologique de l'environnement dans les phases du projet ;
- Proposer des modes et techniques de gestion adéquats des déchets dangereux ;
- Identifier les risques (accidents, explosions, incendies, risques technologiques ou techniques), liés aux activités du projet ;
- Proposer les mesures de prévention des risques et élaborer un plan d'urgence conformément à la réglementation sur les établissements classés ;
- Proposer au cas échéant un plan de compensation des personnes affectées par le projet ;
- Élaborer un plan de gestion environnementale et sociale (PGES) du projet
- Rédiger le rapport final de l'EIES dont 20 exemplaires écrits seront remis au MINEPDED avec une copie électronique sur CD-ROM.

IV.2 Méthodologie

Pour réaliser l'EIES complète, le consultant s'appuiera sur :

- la collecte des données bibliographiques ;
- la collecte des données de terrain ;
- les travaux de bureau (Identification, analyse et caractérisation des impacts) ;
- les interviews et entretiens divers ;
- l'organisation des consultations publiques.

Le consultant définira une approche méthodologique appropriée dans la conduite de l'étude.

IV.3 Description de la zone d'influence du projet

L'étude décrira de façon générale, les composantes pertinentes de l'environnement, par rapport aux enjeux et impacts du projet. L'étude couvrira les points suivants :

IV.3.1 Environnement physique

Il sera question de faire une revue des données sur la géomorphologie et la pédologie, l'hydrologie, l'hydrogéologie, le climat (pluviométrie, température, humidité, évapotranspiration, insolation, etc.), la qualité de l'air et les sources actuelles de pollution atmosphérique, la qualité de l'eau dans le milieu réception-évacuation (exutoire).

IV.3.2 Environnement biologique

Il sera question de faire une revue des données sur la flore et la faune. Les espèces rares ou menacées ainsi que les habitats sensibles le cas échéant, les sites naturels d'intérêt particulier, les espèces animales potentiellement nuisibles directement ou en tant que vecteurs de maladie devront être analysés.

IV.3.3 Environnement socio-économique et humain

Sur le plan économique, une synthèse des activités des populations sera faite notamment celles liées à la zone du projet, les activités/projets de développement prévus ou en cours de réalisation, les emplois et services, les indicateurs du bien-être. Sur le plan socioculturel, l'étude ressortira des données sur la démographie, la composition ethnique, le nombre, l'état et la localisation des implantations humaines, le mode d'utilisation de l'espace, les infrastructures socio-économiques et notamment les réseaux d'adduction en eau potable, de téléphone ou d'électricité susceptibles d'être impactés par les activités du projet, les structures communautaires, les mœurs, les coutumes, etc.

IV.3.4 Analyse des impacts prévisionnels sur l'environnement

L'identification d'impact vise à déterminer comment le projet affectera les

éléments de l'environnement aussi bien en phase de mise en place qu'en phase d'exploitation. Cette partie sera obligatoirement discutée avec toutes les parties concernées. Les différentes actions à mener comprennent :

a) Identification et évaluation des impacts

L'étude identifiera des impacts les plus significatifs. Il est recommandé à ce stade de recourir à une matrice d'identification d'impacts et à des listes de contrôle ou à toute autre méthode fiable.

b) Caractérisation

Une fois que l'étude établira qu'un impact est susceptible de se produire, elle devra le caractériser. Dans ce contexte, elle considère les impacts positifs et négatifs directs et indirects et, le cas échéant, les impacts cumulatifs en rapport avec les autres activités menées dans la zone du projet en général.

L'étude devra caractériser les différents impacts en utilisant entre autres les critères suivants :

- la nature de l'impact ;
- l'intensité ou l'ampleur de l'impact (degré de perturbation de la composition environnementale, qui est fonction de la sensibilité ou de la vulnérabilité de la composante concernée) ;
- l'interaction ;
- l'étendue de l'impact ;
- la durée de l'impact ;
- la probabilité que l'impact se produise ;
- la réversibilité.

c) Evaluation de l'importance de l'impact

Chaque impact identifié et caractérisé sera ensuite évalué. Cette évaluation permettra de déterminer le degré des atteintes des milieux concernés. Il s'agira notamment des atteintes de l'air, des eaux de surface, des eaux souterraines, des sols, de la santé et la sécurité des hommes (personnels du projet aussi bien en phase de mise en place qu'en phase d'exploitation ainsi que les populations riveraines et les usagers), etc. L'évaluation de l'importance des impacts devra être faite en utilisant une méthode avérée.

d) Mesures d'atténuation et d'évaluation des coûts

Les mesures que proposera le consultant devront être des mesures techniquement

et économiquement réalisables. Ces mesures devront s'inspirer des bonnes pratiques environnementales reconnues au niveau international.

e) Prévention, atténuation et/ou suppression

Pour les impacts négatifs, l'étude proposera les mesures environnementales adéquates pour la cause.

f) Compensation des impacts

L'étude envisagera des mesures de compensation pour les impacts résiduels après application des mesures d'atténuation.

g) Optimisation des impacts

L'étude envisagera des actions visant à optimiser les impacts positifs.

IV.4 Consultation publique

La participation du public à la réalisation de l'EIES se fera suivant la procédure des consultations publiques, telle que prescrite par l'article 20 du chapitre III du décret n° 2013/0171/PM du 14 février 2013 fixant les modalités de réalisation des études d'impact environnemental et social.

Ces consultations publiques se feront sur la base de réunions avec les autorités administratives qui se tiendront à Douala et avec les populations à la chefferie d'Essengue pendant la réalisation de l'EIES. Les consultations seront programmées par le promoteur selon l'avancement des travaux du consultant sur la base du mémoire descriptif et justificatif exposé dans les présents TDR et après l'approbation de ces derniers par le MINEPDED.

Au cours de ces consultations, les autorités et les populations riveraines seront consultées et informées (en langage simple et non technique) des impacts du projet.

Les procès-verbaux de ces réunions seront signés par les participants et feront partie intégrante du rapport final de l'EIES.

IV.5 Plan de Gestion Environnementale et Sociale (PGES)

Le rapport final de l'EIES proposera un Plan de Gestion Environnementale et Sociale (PGES) qui indiquera les impacts négatifs et la manière dont ils seront atténués. Ce plan devra être présenté sous la forme d'un tableau qui fera ressortir :

- les activités sources d'impact ;
- les composantes affectées ;
- la description des impacts identifiés ;
- les mesures d'atténuation (actions à mener) ;
- les objectifs visés par ces mesures ;
- les acteurs chargés de la mise en œuvre et du suivi ;
- le chronogramme de mise en œuvre de ces actions ;
- les indicateurs de suivi ;
- la fréquence du suivi ;
- les institutions de supervision ;
- le coût des actions.

Chapitre 6 V. ECHEANCIER DE L'ETUDE

V.1 Durée de l'étude

La durée de l'étude d'impact environnemental du projet, sera de 12 semaines soit 03 mois.

Cette durée sera comptabilisée après l'approbation des présents Termes De Référence (TDR) par le Ministère de l'Environnement, de la Protection de la Nature et du Développement Durable et à la notification de cette approbation à AFISA.

Toutefois, ce délai prendra en compte les contraintes administratives et les délais obligatoires requis pour l'organisation des consultations des parties prenantes.

V. 2 Equipe des experts

La composition de l'équipe d'experts et la durée d'intervention de chacun des membres sont laissées à l'appréciation du bureau d'études.

Toutefois, les compétences minimales suivantes sont requises dans l'équipe pour une durée maximale d'un mois à compter de la date de validation des TDR.

- Un chef de mission, Expert en Sciences de l'environnement, justifiant des

compétences et d'une bonne expérience dans la gestion participative. Il devra impérativement avoir mené au moins trois (03) études d'impact sur l'environnement ou audit environnemental d'importance comparable au Cameroun. Une justification d'au moins cinq (05) ans d'expérience générale dans le domaine des évaluations environnementales serait souhaitable ;

- Un ingénieur Génie Industriel ayant au moins cinq (05) ans d'expérience et justifiant d'une bonne expérience dans la gestion environnementale en milieu industriel ;

- Un juriste ayant une expérience en droit de l'environnement en milieu industriel ;

- Un socio-économiste ayant une expérience générale de cinq (05) ans et justifiant d'une bonne expérience dans les études d'impact environnemental et social.

Par ailleurs, l'attention du cabinet d'études sera attirée sur le fait qu'au moins la moitié du temps de prestation de chaque expert soit consacrée au travail sur le terrain.

Le cabinet d'études pourra réajuster la composition de l'équipe d'experts en tant de besoin.

Chapitre 7 VI. CONTENU DU RAPPORT DE L'EIES DU PROJET

Les travaux menés pour la réalisation de l'EIES du projet construction et exploitation d'une agro-industrie de production de farine seront restitués sous la forme d'un rapport final.

Cette partie du rapport comprendra non seulement sa structuration, mais aussi une rubrique qui présentera la remise en l'état du site exploité.

Conformément aux dispositions du décret n° 2013/171/PM du 14 février 2013 fixant les modalités de réalisation des études d'impact environnemental et Social, le contenu de cette étude comprendra :

- Le résumé de l'étude en langage simple en français et en anglais ;
- La description et l'analyse de l'état initial du site, son environnement physique, biologique, socio-économique et humain
- La description et l'analyse de tous les éléments et ressources naturels, socioculturels susceptibles d'être affectés par le projet ainsi que les raisons du choix du site ;

- La description du projet et les raisons de son choix parmi les solutions possibles ;
- La revue du cadre juridique et institutionnel pris en compte dans cette étude ;
- L'identification et l'évaluation des effets possibles de la mise en œuvre du projet sur son environnement naturel et humain ;
- L'indication des mesures prévues pour éviter, réduire ou éliminer les effets dommageables du projet sur l'environnement ;
- Le programme de sensibilisation et d'information ainsi que les procès-verbaux des réunions tenues avec les populations, les organisations non gouvernementales, les syndicats, les leaders d'opinions et autres groupes organisés concernés par le projet.
- Le plan de gestion environnementale et sociale comportant les mécanismes de surveillance du projet et son environnement et, le cas échéant, le plan de compensation ;
- Les termes de référence approuvés de l'étude ;
- Les références bibliographiques y relatives.

VI PROGRAMME DES CONSULTATIONS PUBLIQUES

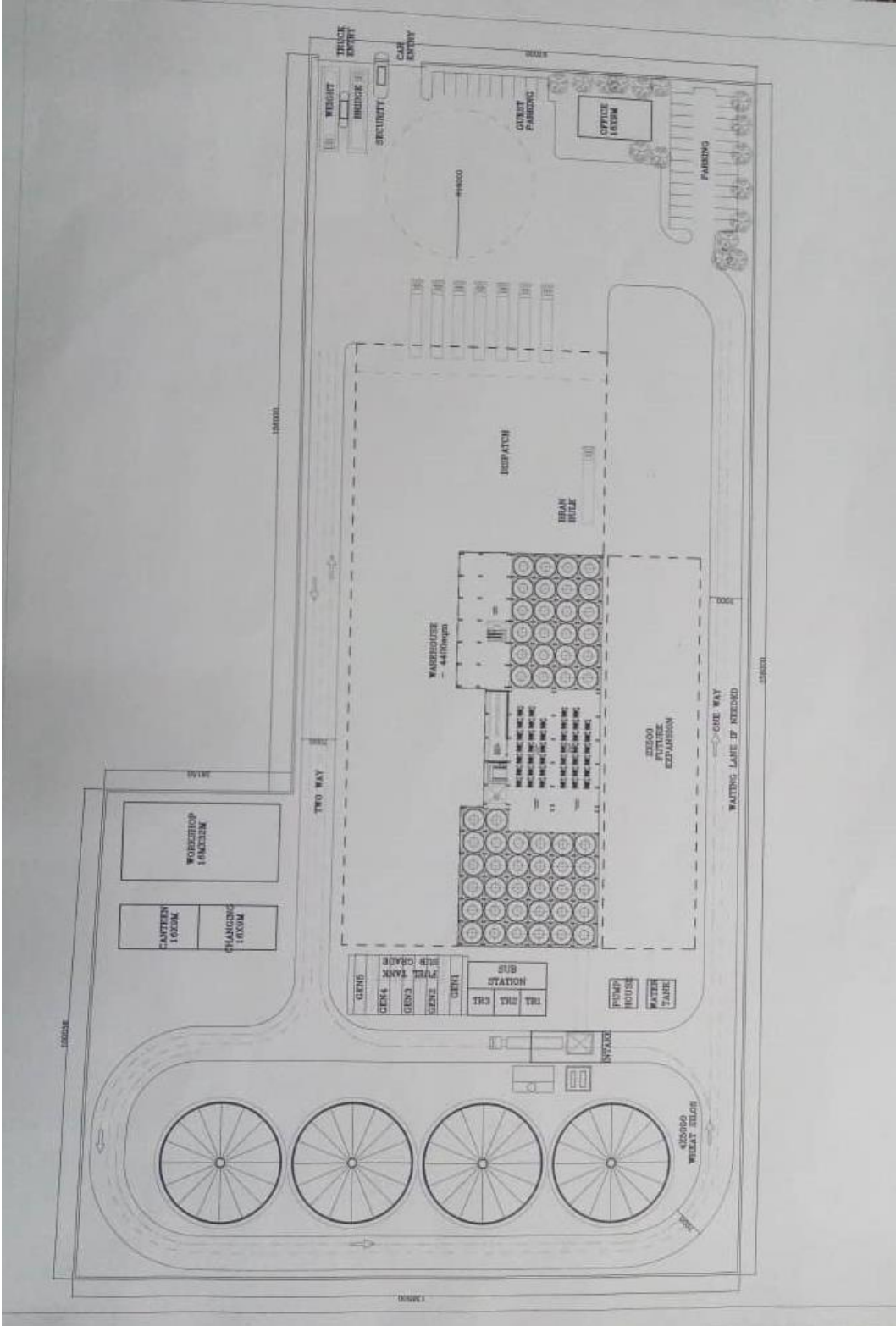
Le programme des consultations publiques sera remis aux représentants des populations environnantes de la zone du projet, aux compagnies environnantes et à tous les partenaires qui sont sur la liste, 30 jours avant la date de la première réunion de consultation publique.

Le tableau ci-dessous représente le programme sensibilisation et des réunions de consultations publiques des parties prenantes du projet.

Tableau : Calendrier Prévisionnel des consultations publiques

Date	Horaire	Objet	Acteurs ciblés	Lieu
16 au 21 Août 2021	9h - 11 h	Rencontre avec les autorités administratives	- Maire commune de Douala 1 ^{er} et conseillers municipaux - Les Délégués départementaux du MINEPDED, MINMITD, MINDCAF MINTSS et MINCOMMERCE du Wouri.	Bureaux respectifs
	13h- 16h	Rencontre avec les populations	Riverains et les populations de Essengue	Chefferie de Essengue

Termes de référence de l'étude d'impact environnemental et social du projet de construction et exploitation de la Minoterie d'AFISA à Essengue, Zone portuaire de Douala



Annex 4 : Minutes of the public consultation

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DE LA MINOTERIE D'AFISA

PROCES VERBAL DE LA REUNION DE CONSULTATION PUBLIQUE DU 29 OCTOBRE 2021 AVEC LES POPULATIONS RIVERAINES

L'an deux mille-vingt-un et le vingt-neuvième jour du mois d'octobre, s'est tenue la réunion de consultation relative à l'étude d'impact environnemental et social du projet de construction et d'exploitation d'une minoterie dans la zone portuaire.

Objectifs :

- Compléter l'identification des impacts des activités de l'entreprise sur les composantes environnementales ;
- Recueillir les informations pertinentes à prendre en compte dans la conduite de l'étude.

Participants

- Le chef de village,
- Notables,
- Populations locales,
- Promoteur
- BET

Ordre du jour

- Mot de bienvenu;
- Présentation du cadre juridique en EIES;
- Présentation du projet;
- Présentation du projet et ses activités ;
- Présentation des travaux d'étude et aspects environnementaux ;
- Intervention des participants (questions-réponses) ;
- Résumé des interventions ;
- Clôture.

La rencontre de consultation a débuté à 13h50' par le mot d'ouverture d'un chef de famille en la personne de Mr **DINA BEBE** qui a souhaité la bienvenue à tous les participants suivi d'une courte prière. Un modérateur a été désigné en la personne de M NDOUMBE BOLANGA pour conduire les travaux. Aussitôt, ce dernier a pris la parole et a déroulé l'ordre du jour ci-dessus. D'entrée de jeu, il a passé la parole au bureau d'études pour un mot.

Le BET a souhaité la bienvenue à tous les participants et a présenté l'objet de la rencontre du jour tout en présentant ses excuses pour le retard avec lequel les travaux ont commencé.

Après ce mot, place a été donnée pour la présentation du cadre juridique par le BET. Prenant la parole, M KABEYENE a mis l'accent sur des textes de loi élaborés à ce sujet. Il a d'abord mentionné le préambule de la constitution qui donne le droit à chaque citoyen d'avoir un environnement sain. Le Cameroun a adopté les règlements les lois régissant la gestion de l'environnement, la loi-cadre 96 dont l'article 17 recommande la réalisation d'une étude d'impact environnemental et social pour tout projet d'aménagement, d'équipement ou d'installation avant sa mise en œuvre en vue d'évaluer les incidences directes et indirectes sur le milieu naturel développement et l'article 72 qui parle de la participation des populations, le décret d'application N° 2013/0170/PM du 14 février 2013 fixant les modalités de réalisation des études d'impact environnemental et l'arrêté 00001/2016 du 08 février 2016 fixant les différentes catégories d'opérations dont la réalisation est soumise à une étude d'impact environnemental et social. Il existe différentes types d'études selon la réglementation à savoir l'EIES, l'EES et la NIE.

A la suite du cadre juridique, le projet a été décrit par M BELL MAHOUE responsable HSE, de la société AFISA FOOD Industry S.A. Selon lui, AFISA est une filiale du GROUP TRANS AFRIQUE GENERAL TRADING spécialisé dans la production des farines de blé. Créée en 2015, AFISA dispose à ce jour de 2 usines de production situées dans les régions du Littoral et de l'Adamaoua précisément à Douala et de Ngaoundéré. AFISA s'est donné pour mission de créer continuellement de la valeur et de contribuer au bien-être des populations en mettant à leur disposition une large gamme de farine de blé de qualité supérieure répondant aux normes industrielles en vigueur. Pour le faire, la société AFISA ambitionne l'augmentation de sa capacité de

production par la construction d'une grande usine qui pourra répondre à ce besoin. Le blé utilisé principalement à AFISA est importé et provient des pays de l'Europe et de la Russie. Il est de deux ordres ou types à savoir le blé doux et le blé tendre dont les proportions en valeurs nutritives sont importantes. Ainsi, le blé issu de l'importation arrive par bateau puis il est stocké dans les silos et magasins. Ce blé est nettoyé par la suite afin d'enlever les impuretés avant la mouture, le blé ainsi transformé est conditionné dans des emballages. L'entreprise travaille en étroite collaboration avec le MINSANTÉ et MINCOMMERCE qui veillent au grain pour le respect des valeurs nutritives du blé et des normes alimentaires. Les farines ainsi produites servent à la fabrication du pain, des beignets et des pâtes alimentaires. Les différents produits sur le marché issus de la transformation du blé (Mama makala, Choix du boulanger, Africana, Primo..). Le projet étant une unité industrielle, a également besoin d'une autorisation d'implantation et d'exploitation.

Sachant qu'un projet de développement ne peut se faire sans effets secondaires sur le milieu environnant, les impacts ci-dessous sont à considérer : La présentation des activités du projet qui se déclinent en trois phases faite par GES CONSULTING :

- Phase d'aménagement (installation du chantier, désherbage, intensité du trafic, émissions des poussières, aménagement).
- Phase de construction : (bruits, risque d'accidents et incidents, émissions des gaz, déchets BTP brassage des populations risque de conflit, Gestion des déchets plastiques par des structures agréées, création d'emplois),
- Phase d'exploitation/production (accroissement de l'assiette fiscale, approvisionnement du marché local, risque de dysfonctionnement des équipements)

M BOLLANGA NDOUMBE, le modérateur a repris la parole et a invité les participants à poser des questions utiles et importantes et non point à s'attarder sur ce qui ne construit pas.

Les questions et préoccupations des participants :

M NTOU MOUELLE : pourquoi la consultation publique se passe-t-elle avant et pas après la réalisation du projet ?

- Besoin d'une franche collaboration avec AFISA, recruter quelque soit la compétence, privilégier et former la main d'œuvre locale pour les travaux d'ingénierie.

ITONI S.P : comment se fera le conditionnement de la farine et quel en sera le grammage?

- Où seront déposés les déchets issus du décorticage du blé,
- Besoin des assurances plus concrètes en ce qui concerne le recrutement des locaux

LOBE Emmanuel : pourquoi l'absence des représentations administratives aux travaux ?

TIDIKAI : la venue de AFISA est-elle en accord avec le PAD ou la chefferie ?

LEA EYOUM : pourquoi n'y-a-t-il pas de consultation après la réalisation de l'EIES ;

ALI KOIRRE: besoin des sociétés citoyennes qui respectent les composantes sociologiques dans le recrutement des riverains;

KOUM DJEMBA : la loi-cadre définit les axes de l'EIES : à quel niveau se situe l'EIES ?

- La société a-t-elle un volet responsabilité sociétale ?

NDOUMBE BOLLANGA : souhaite que la plateforme entre la société AFISA et la communauté soit formalisée et matérialisée.

NTOU MOUELLE : le rôle de l'architecte étant de concevoir les plans et non de réaliser les travaux de construction, quel est l'apport des architectes locaux dans ce projet ?

BELHE Teclaire : Est-ce que la société AFISA a prévu des actions sociales qui pourront profiter au village du faite de son installation ?

Les réponses suivantes ont été données

- Le législateur n'a pas prévu de consultation publique après la réalisation de l'EIES. La consultation se déroule avant car elle est partie intégrante du rapport d'EIES. La consultation publique vise à informer, recueillir les informations pertinentes à prendre en compte dans la conduite de l'EIES et de compléter l'identification des impacts des activités de l'entreprise sur les composantes environnementales et sociales ; ce travail doit se faire en communauté.
- En ce qui concerne le recrutement de la main d'œuvre locale, c'est une préoccupation fondamentale; le législateur a prévu dans des textes à ce sujet. Il existe des catégories de travailleurs, des ouvriers aux ingénieurs. Les postes à pourvoir seront affichés à la chefferie où ils pourront être consultés par les riverains. Il faudrait aussi que les

riverains s'approprient des outils mis à leur disposition afin de pistonner les entreprises installées dans leur terroir. De la construction à l'exploitation, les activités se succéderont et le recrutement se fera en fonction de la demande.

- Le conditionnement se fera en sac de 50kgs, 25 kgs et 5kgs.
- L'activité en elle-même ne produit pas de déchets proprement dits. La peau issue du décortilage du blé est vendue sous forme de son aux vendeurs de provendes. Quant à l'eau usée, il n'en existe pas vraiment. Les déchets de bureau sont enlevés par la société HYSACAM pour traitement contre reçu de traçabilité (manifeste).
- En fonction de la situation et du contexte qui se présente, plusieurs approches de consultation peuvent être utilisées pourvu que les parties prenantes soient consultées.
- L'EIES est à sa phase préliminaire raison pour laquelle nous consultons les parties prenantes
- La société AFISA intègre la composante sociologique dans le recrutement de sa main d'œuvre;

- Les populations sont appelées à définir elles-mêmes leurs préoccupations par le biais de leur chef, il faut travailler en étroite collaboration avec le chef de village;
- Pour la construction d'un tel projet, il est souvent requis à l'architecte postulant un antécédent d'expérience en la matière;
- AFISA est une entreprise à capitaux privés et apporte autant que ce peut l'assistance sociale tout en prenant des précautions pour ne pas s'exposer.
- Il n'existe pas de poste de corporate social relation, l'entreprise est citoyenne et fait quelques réalisations pour le compte des communautés, pour que cela se fasse il faut une dynamique de la part des responsables des communautés (chefs)

Les populations ont émis quelques doléances à savoir :

- Le recrutement des riverains ;
- La création d'une plateforme de collaboration franche entre l'entreprise et la communauté ;
- L'affichage des postes à pourvoir à la chefferie
- L'assistance au niveau des infrastructures et œuvres sociales existantes

Le round up des échanges a été fait par NDOUMBE BOLLANGA qui a passé la parole au BET pour le mot de fin. Un mot de remerciement a été servi à l'endroit des participants pour leur présence et participation active aux travaux.

Le procès-verbal est dressé pour servir et valoir ce que de droit.

Fait à Douala, le 29 Octobre 2021

AFISA SA



ANNEX 5: ATTENDANCE SHEET

CONSULTATION PUBLIQUE DES POPULATIONS RIVERAINES DANS LE CADRE DE L'ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DETAILLÉE DU PROJET DE CONSTRUCTION ET D'EXPLOITATION D'UNE MINOTERIE A LA ZONE PORTUAIRE,

LE 29 OCTOBRE 2021

Décret No 2013/0171/PM du 14/02/2013 fixant les conditions de réalisation d'étude d'impact environnemental

FICHE DE PRESENCE

N°	Noms et prénom	Organisme/quartier	Profession	Téléphone	Visa
1	Yves Agnès Robert Emile	Bon'Essengue	Architecte	699184289	
2	LEA EYOUN EYOUS	DIKETI	Retraite (NOTABE)	69930207	
3	DINA BEBE SAMUEL	Bona Nandeng	-11-(PINF)	699 65 69 86	
4	EKWE MARTIN	BON'EKWE	Chef de famille	69988878	
5	EKWE EBENZER	DIKETI	Expert humanitaire	699919072	
6	Koum Djemba Joseph S	Bona ndoumbe	Chef de famille	697314596	
7	LOBE BELL Richard Alain	NHAKO N'EBELE	Ingenieur	699115263	
8	ISSOUM GANG GOROU	SABOS ISSOUM	Technicien	690404876	
09	ALI KOIRRE	ESSENGUE	chef massa	694009109	
10	TIOUKAI ATAPANAI	ESSENGUE	PHYSICIAN	699261834	
11	NWATSIK AKO YVES C	ESSENGUE	NOTABE	694271486	
12	NKOSSO MENDOWA	ESSENGUE	HABITANT	65793905	

N°	Noms et prénom	Organisme/quartier	Profession	Téléphone	Visa
13	GEORGES MBARPOUN GOMBE	BALI		677623121	
14	Tchakoute Aelain	ESSENGUE	Reclutero	699.18.52.82	
15	Ngambé Diez Daniel	Bali/Ananjo	Metreux	677 308059	
16	EKANDE MBELLA HENRI	BONANJO	Employeur Bureau	699-13-50-88	
17	DUMATON MIB'	ESSENGUE	Milieu PAIR	69900164	
18	LOBE LOBE EMMANUEL	ESSENGUE	BOXEUR	695773075	
19	BOGNYAMS FRANÇOIS	ESSENGUE	BOXEUR	695 532-32-68	
20	IZONI S. P. S.	ESSENGUE	Rivonnain	69408-8878	
21	Mme BELHE TECLAIRE	ESSENGUE	Affaire	696369107	
22	MUKWELLE NGALLE EMMANUEL	ESSENGUE	Cubeur	694392295	
23	Moumoufo Marie	ESSENGUE	Commerçante	693584072	
24	Agusta Eitel Notable	Notable ESSENGUE		674 49 25 55 77	
25	Ngoh Isaac dieu	Bomononjo	Juge		

N°	Noms et prénom	Organisme/quartier	Profession	Téléphone	Visa
26	NGANGIO. ADOLPHE. PASCAL	NOTABLA P.V	Magasiniste	690464934	
27	BOUBAKAY			658790835	
28	LOBE Emmanuel	CHEF QUARTIER PETIT VILLAGE (Essengue)	COMPTABLE	674438477 671887298	
29	ESSAWE EBINBE MARTIN	BALI - BOKANJO	Agent de liquidation Chambre de Commerce	67311873	
30	NDOUMBE BOLALEGA	BALI - BOKANJO	Commercial	677752158	
31	LONDSI METOPA NATACHA FLORE	BEKANDA BOULANGERIE LA PAIX		693803392 681443597	
32	MATENE NAOUSSI CLARICE	GES CONSULTING	Environnementaliste	67255558	
33	KABEYENE PATRICK N	GES CONSULTING	Consultant	698782672	
34	BELL FLORE	GES CONSULTING	Consultante	696995164	
35	PRISO DORIS	GES CONSULTING	Consultant	699504000	
36	BELL MAHOUVE	AFISA			

ANNEX 6: OPINION GATHERING FORM

FICHE DE CONSULTATION INDIVIDUELLE

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DE LA MINOTERIE D'AFISA A LA ZONE PORTUAIRE DE DOUALA ARRONDISSEMENT DE DOUALA 1^{ER}

AVIS SUR LE PROJET

Projet socio-économique pertinent qui intègre les communautés

Préoccupations/craintes relatives à la mise en œuvre du projet

Essentiellement d'ordre socio-environnementale :
 Dans le but de favoriser l'accès et l'emploi des populations riveraines, de contribuer à l'amélioration des services sociaux de base, de protéger l'environnement immédiat et de contribuer à l'éclaircissement de l'Arrière Fiscal de la Commune.

Suggestions et recommandations pour une meilleure intégration du projet dans son environnement

Nom et signature	Fonction	Téléphone
	 C. Lavoisier Conye Ingénieur TP/Spéc. Hydraulique, Assainissement, Bâtiments et Travaux Publics Master Pro en Environnement & Développement Durable.	

FICHE DE CONSULTATION INDIVIDUELLE

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DE LA MINOTERIE D'AFISA A LA ZONE PORTUAIRE DE DOUALA ARRONDISSEMENT DE DOUALA 1^{ER}

AVIS SUR LE PROJET



Projet de qualité permettra certainement la réduction du chômage et de la pauvreté

Préoccupations/craintes relatives à la mise en œuvre du projet

- Prendre en compte les mesures spécifiques de sécurité correspondant à l'environnement dans lequel vous vous trouvez.

Suggestions et recommandations pour une meilleure intégration du projet dans son environnement

- Disposer d'une autorisation d'implantation et d'exploitation
 - Disposer d'une étude des dangers et d'un plan d'urgence
 - Mettre en œuvre toutes les mesures de sécurité préconisées

Nom et signature	Fonction	Téléphone
 "HAPICHEJI EOLAI" Epse. EKANGO Ing. des Tech. Industrielle Directeur Asserments	 Délégué	

FICHE DE CONSULTATION INDIVIDUELLE

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DE LA MINOTERIE D'AFISA A LA ZONE PORTUAIRE DE DOUALA ARRONDISSEMENT DE DOUALA 1^{ER}

AVIS SUR LE PROJET

Projet porteur createur d'emplois.
Nous pensons que s'il est bien mené,
ce sera un avantage pour la cité.


Préoccupations/craintes relatives à la mise en œuvre du projet

objectivement: Concernant le personnel, le projet
présente des risques qui peuvent affecter la
santé

Nous craignons aussi une légèreté dans le
respect des règles du travail et les conditions de SST.

Suggestions et recommandations pour une meilleure intégration du projet dans son environnement

- Affilier tout le personnel à la CNPS
- Obtenir tous les documents légaux obligatoires en matière de Travail.
- Avoir un CHS fonctionnel directement après l'ouverture.
- Collaborer avec le MINTSS / DRTSSL pour l'accompagnement

Nom et signature	Fonction	Téléphone
 Evombe Nalla Elisabeth Cheffe Nkangana Administrateur du Travail et de la P.S.	Inspecteur Régional du Travail et de la Sécurité sociale MINTSS	679786247

**ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU
PROJET DE CONSTRUCTION ET D'EXPLOITATION DE LA
MINOTERIE D'AFISA A LA ZONE PORTUAIRE DE
DOUALA ARRONDISSEMENT DE DOUALA 1^{ER}**

FICHE DE CONSULTATION INDIVIDUELLE

Question 1 : Avis sur le projet

R 1 : - Il s'agit d'un projet d'une importance avérée puisque la minoterie d'AFISA se propose de s'investir dans un des produits les plus prisés en termes de besoin alimentaire. D'autre part, il contribuera à booster l'économie nationale et à favoriser la création d'emplois, gage de la baisse du taux de chômage. Vu sous cet angle, l'on ne peut que louer l'initiative prise pour la mise sur pied de ce projet d'envergure, à la dimension de ce que la Minoterie d'AFISA envisage de réaliser. Toutefois, la tendance à la fluctuation du prix de la farine de blé dans nos marchés crée souvent les conflits entre les décideurs, qui doivent préserver le bien-être des populations en leur assurant un approvisionnement de ce produit à hauteur de leur pouvoir d'achat, et les minotiers dont la tendance est au durcissement des prix de session du sac de farine de 50kg.


Question 2 : Préoccupations/craintes relatives à la mise en œuvre du projet

R 2 : - La crainte réside sur la possibilité d'accroissement de la tension entre les décideurs et AFISA par rapport au prix à déboursé par les ménages. En d'autres termes, il est question de se demander si la création d'AFISA ne viendra pas grossir le nombre de ceux qui réclament aux décideurs, la révision à la hausse des prix du produit concerné, réclamation dont la répercussion sera de nature à baisser le pouvoir d'achat du fournisseur intermédiaire qui voudra récupérer ses charges auprès du détaillant qui, par effet boule de neige, voudra récupérer les siennes auprès du consommateur final. Par ailleurs, l'émanation des poussières et des nuisances sonores devrait être prise en compte pour préserver la tranquillité non seulement du consommateur riverain, mais aussi celle des employés.

Question 3 : Suggestions et recommandations pour une meilleure intégration du projet dans son environnement

R 3 : - Afin de palier à la recrudescence des prix du produit fini causée par la hausse de sa demande, il serait opportun d'envisager, dans un futur proche, la substitution de la matière première importée par nos produits locaux tels que la farine de patate, de manioc, de plantain ou autre spéculation dont la réalisation des pains et pâtisseries émeut plus d'une personne lors des foires d'exposition des produits "Made in Cameroon".
En outre, concernant les produits concurrents de même nature, l'idéal serait d'aligner les prix des produits de la minoterie d'AFISA à un niveau inférieur à la moyenne des prix de la concurrence.

PERSONNE CONSULTÉE

NOM ET PRENOMS	FONCTION/QUALITE	CONTACT ET SIGNATURE
Madame SOSSO épouse MAGNAGUEMABE Aurélie	Délégué Départemental du Commerce	655 080 887 

ANNEX 7: GROUND PLAN

