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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE CONSTRUCTION AND OPERATION PROJECT OF WHEAT STORAGE TANK AT THE DOUALA PORT ZONE, DOUALA 1 SUBDIVISION, WOURI DIVISION, LITTORAL REGION DOUALA- CAMEROON

December 2023

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LIST OF ABREVIATIONS

AES	Environmental and social aspect
BET	Consultancy Firm
CAMTEL	Cameroon Telecommunication
CEMAC	Economic and Monetary Community of Central Africa
EIE	Environmental impact Assessment
EIES	Environmental and social impact Assessment
IST	Sexually transmitted infection
NIE	Environmental Impact Statement
CNPS	National Social Insurance Fund
CIE	Inter –Ministerial Committee
EIE	Environmental Impact Assessment
EPI	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 Extincguish system
S.A	Anonym Company
SIDA	Acquired Immunodeficiency Syndrome
VIH	Human Immunodeficiency Virus

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NON TECHNICAL SUMMARY

AFISA S.A. has decided to build and operate 16 wheat storage tank. 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 around vegetation formation consists of swampy wooded areas with species such as Oxystigna manii (bosipi) and some Raphia vinifera (raffia), the littoral forest in the sandy plain which is characterized by the presence of Saccoglotis (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 silos of 5,000 tons capacity each. This will involve building foundations to support the Silos, construction of conical metal tanks, equipment for the plumbing system for transport by coring and driving wheat into the Silos.

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 (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 (development of the local, regional and national economy; job creation).

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

- 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 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**) in construction phase and **fifteen millions CFA francs** (**15 000 000 FCFA FCFA**) in operation phase

RESUME NON TECHNIQUE

La société AFISA S.A a décidé de créer une unité de stockage du blé par la construction de 16 silos ayant une capacité de 5 000 tonnes chacun. 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 règlementation en vigueur en matière de gestion environnementale, notamment la loi 96/12 du 05 août 1996, qui exige à tout promoteur de réaliser une évaluation 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 l'unité de stockage. 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 le port autonome de Douala, situé 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 de la zone environnante au site 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 Saccoglotis (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 des silos de 5 000 tonnes. Il s'agira de construire des fondations de support des Silos, construction des cuves métalliques coniques, équipements du système de plomberie de transport par corroyage et de conduite de blé dans les Silos.

Au regard des activités du projet, une réunion de consultation publique s'est tenue avec les délégués départementaux du Wouri des sectoriels ayant un lien avec le projet, les autorités traditionnelles du Canton Bell 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, 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.

GENERAL INTRODUCTION

1. Context and justification of the project

The Promoter of the AFISA 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 as regard to the construction and operation project of a 16 storage tank with capacity of 80 000 tons. 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 Assesssment 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/0169/L/MINEPDED/CAB/CST of August 28, 2023 to carry out the Summary Environmental Impact of the project to build and operate a wheat-processing unit with a capacity of 80 000 tons, the Technical consulting firm by name GES CONSULTING Sarl approved by MINEPDED, under No. A/EIE-AE No. 0003 of 26 January 2021 undertook the mission entrusted by the promoters of the project.

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.

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3. Aims of the study

3.1. Primary 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.

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

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.

5. Présentation du promoteur du projet : 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

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.

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 survey ;
- Collection of primary and secondary data;
- Identification of impacts;
- Identification of measures;
- Consultation with Stakeholder;
- Summary of the data and production of a report, the content of which is defined by the law.

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.

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 was 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 missiontook place after the first stage of data processing and report writing. This third field mission gavel 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.

7.3. Data analysis and drafting of the 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.

- **Determining, Analysing the impact of 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.

- **Characterisation 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

- **Assessing the Significance of Impact**

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.

7.4. Validation of the draft 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 environmental certificate of compliance.

1. 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 siurces 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 28 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 appendixes.

CHAPTER.1 DESCRIPTION OF THE INITIAL STATE OF THE SITE ENVIRONMENT

1.1. Location of the project site and delineation of the study zone

1.1.1. Administrative and geographical location of the site

The construction site of storage silos is located along river Wouri, in the port area between the Douala International Terminal (DIT) base and the customs offices. The site is located between coordinates at latitude North, 4.047197° and 4.0478059° longitude East. 9.685353° et 9.686905° the altitude is 3 m.

In the administrative plan, the area is found in Douala 1 subdivision, Wouri division, Littoral region of Cameroon.

Douala I subdivision is bordered at the east by Douala II subdivision, at the north by river Mbanya separating Douala I from Douala V.

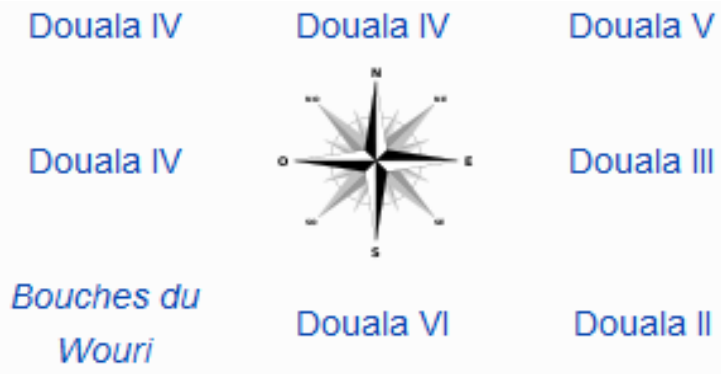


Figure 1: Subdivisions bordering Douala I

1.1.2. Delineation of the project site and the zone of influence

The project site is located within the Douala autonomous port in the Bell canton. Around this Quarter, there are the following quarters : Youpwé, Bonanjo, Bonadoumbé, Koumassi, Bonapriso, ancien aéroport and the Bois de Singe.

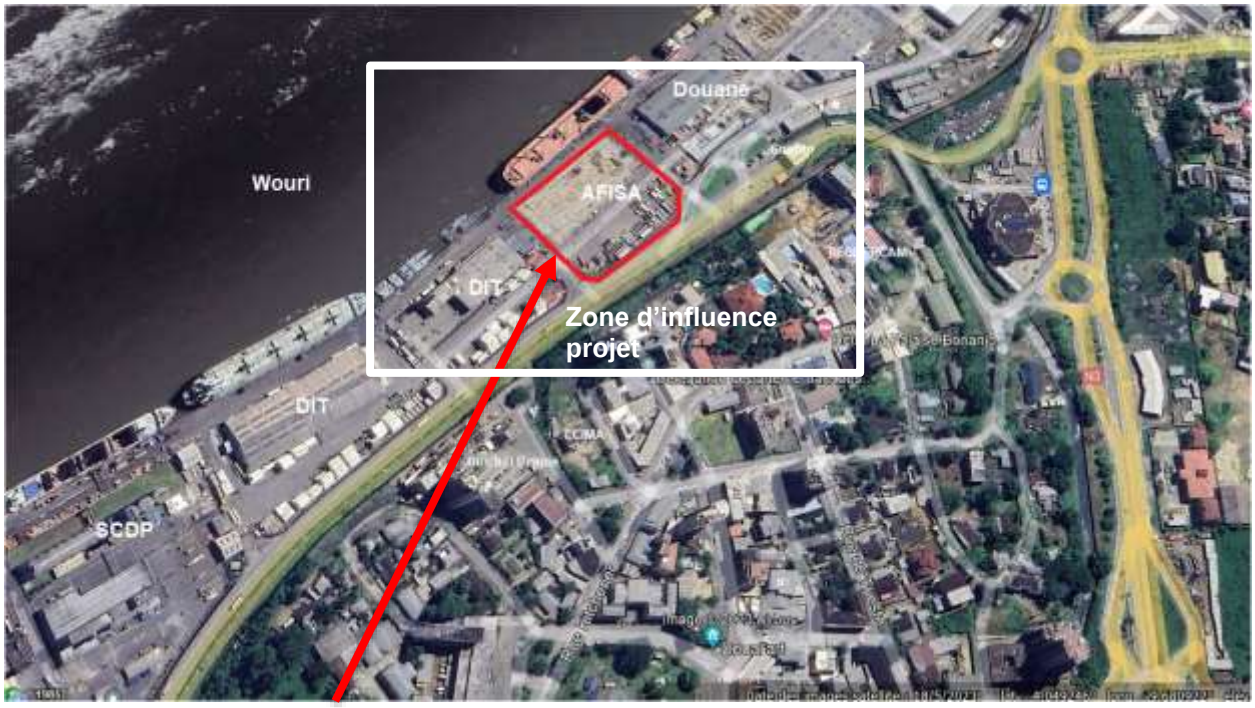


Figure 2: Location of AFISA project site

1.2. Physical environment

1.2.1. 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.

1.2.1.1. Rainfall

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.

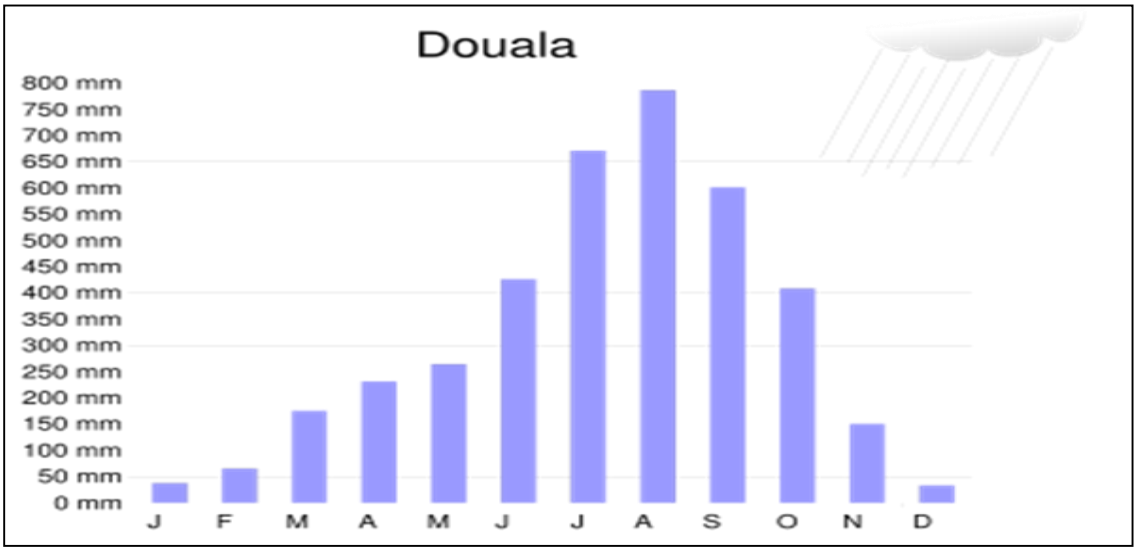


Figure 3: Rainfall in Douala (PDU, 2012)

1.2.1.2. 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

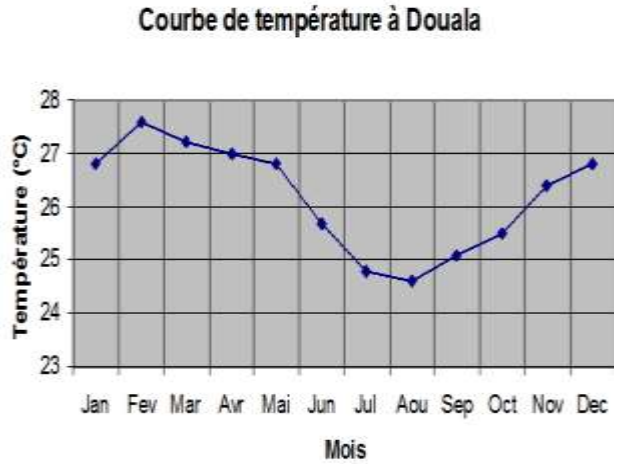


Figure 4: Temperature in Douala (PDU,2012)

1.2.1.3. 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%

1.2.1.4. 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

1.2.1.5. 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.

1.2.2. Soils

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

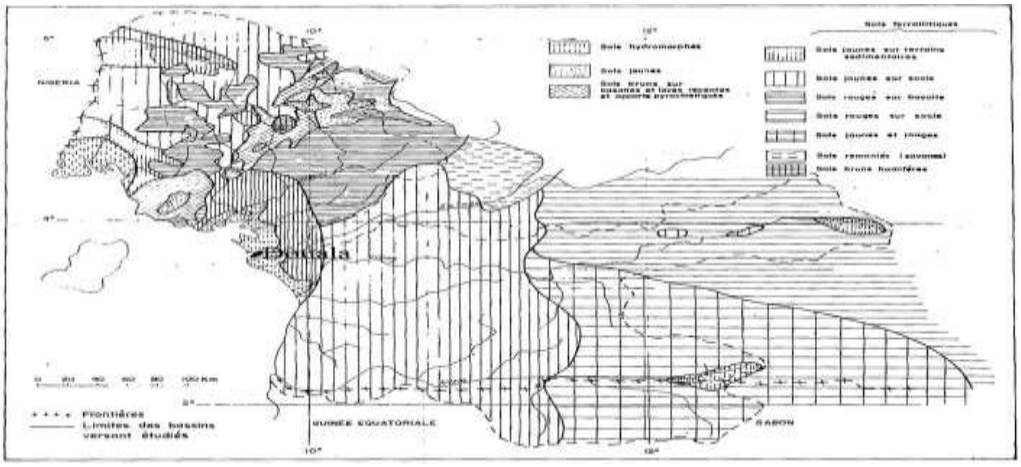


Figure 5: Pedology of Douala region (Olivry, 1986)

- 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.

1.2.3. 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).

1.2.3.1. 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 monoclinal in shape and rest on a fractured Precambrian basement with a staircase structure of unequal height (PDU, 2012).

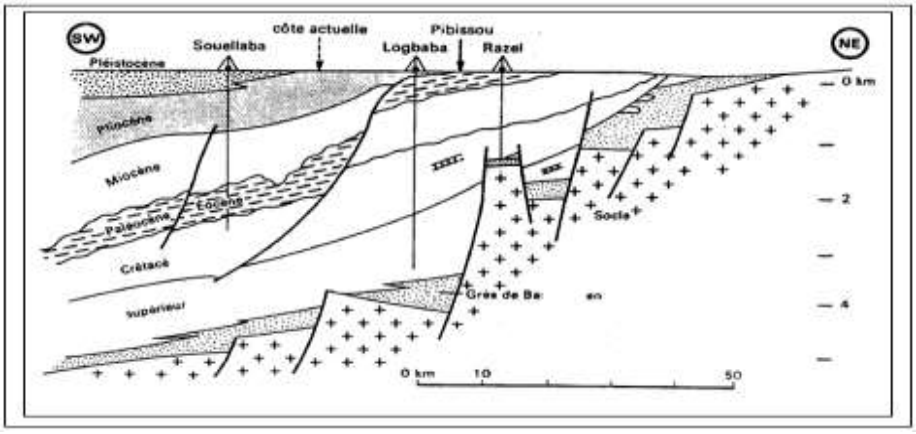


Figure 6: Structure of Douala basin (PDU, 2012)

1.2.3.2. Formation du Wouri

The Wouri formation is about 30 m thick at the mouth of the river and is dated to the Plio-Pléistocène from the appearance of marine microfauna (Olivry, 1986). The formation is formed from the products of erosion of both the paleocene peneplain and the edge of the miocène and paléocène coastline. It consists of three levels : a coarse level, a gravelly level and a sandy level with a more or less clayey or kaolinitic matrix. The table below presents the characteristics of Wouri drainage basin

Tableau 1: Characteristics of Wouri drainage basins (Olivry, 1986)

Characteristics	Wouri drainage basins	Units
Area	11 700	Km^2
Rainfall	2350	Mm
Evaporation	1000	mm
Water flow	1350	mm
Volume flowed (10^9)	16.0	m^3

1.2.3.3. 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.

1.2.3.4. 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 Moungo, 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 km^2.

Picture 1: river Wouri

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 2: Volume of total 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.

1.2.3.5. 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.

Analysis of the air quality, at the project site on October 10, 2023 produced the results shown in the table below:

Table 3: Air quality at the AFISA site

Name of the Project	Construction project of 16 Silos		
Promoter	AFISA		
Place of the project	Wharf Douala Autonomous Port zone		
GPS Location	N4.05912°, E9.69575°		
Date	10/10/2023		
Time	15h35’		
Ambient Temperature (°C)	32.4°C		
Goal	Assessing initial air quality		
PARAMETERS	**RESULTS**	**Limit Value**	
		residential industrial Zones,	**Eco Zone (MINEPDED Norms)**
Carbon monoxide (CO), (mg/m^3)	ND	400	400
Carbon Dioxide (CO_2) ($\mu g/m^3$)	0.1	5000	15000
Methane (CH_4) (ppm)	ND		
Hydrogen sulphide (H_2S) (ppm)	ND	14	14
Ammonia (NH_3) ($\mu g/m^3$)	ND	400	35
Oxygen (O_2) vol	20.9	20-22	20-22
Sulfuret Dioxide (SO_2) (vol)	ND	80	2
Nitrogen Monoxide (NO) (ppm)	ND	-	-
Nitrogen Dioxide d’azote (as NO2)(ppm)	ND	80	5

Source : GES ONSULTING, 2023

1.2.3.6. Water Quality

Analysis of surface water qualityé in the project area based on physico-chemical and biological parameters reveals the presence ofvturbid surface water. The dissolved oxygen, temperature, pH values, conductivity, DBO5, DCO and phosphat of the surface water in the area exceed those of the Water Framework Directive. These high values are due to the discharge of rapidly

degadable organic matter into aquatic environment. These results can also be justified by the high level of human activity, the presence of agricultural and urban run-off water which can bring a surplus of minerals from industrial wastewater. These results highlight the presence of surface water of poor quality.

The analysis of surface water quality de l'eau de took into account its availability in the study area. One (01) point of water was analyzed. The table below shows the parameters of this water.

Name of the Project	Construction project of 16 Silos		
Promoter	AFISA		
Place of the project	wharf Douala Autonomous Port zone		
GPS Location	N4.05912°, E9.69575°		
Date	10/10/2023		
Time	15h35'		
Ambient temperature (°C)	32.4°C		
Objective	Assessing initial quality of surface water		
PARAMETERS	**RESULTS**	**UNITS OF MEASUREMENT**	**Limite Value for treated effluents parameters Standards (MINEPDED)**
Redox Potential	158,3	mV	
Disolved Oxygen	0,05	PPm	
Temperature	26,55	°C	30
P^H	7,08	/	5,5 - 9,5
Salinity	1005	PSU	
Conductivity	20.9	$\mu S.cm^{-1}$	
Turbidity	55,8	NTU	
Chemical oxygen demand (DCO)	87,4	mg/m^3	<200
Biological oxygen demand ($DBO_{5)}$	33	mg/m^3	100
Phosphate	0,23	mg/l	10
Faecal Coliforms	8200	UFC/100ml	≤2000

1.2.3.7. 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.

1.2.3.8. Access to the project site

Located around 100 m from the entrance to the autonomous port via the former customs office, the project site is a former car park.the road leading to the site is therefore laid out in such a way as to facilitate acces to the project site.

Picture 2 : View of the project site

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

1.3.1. 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 Saccoglotis 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 Oxystigna 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 Saccoglotis (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 Acrostichlum aureum, Paspalum vaginatum and Conocarpus erectum

✓ The back zone, flooded only during very high tides, is made up of Avicennia nitida and Acrostichlum 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

Picture 3 : Rhizophora harrisonii and Rhizophora regalis

1.3.2. 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 pictures below show two species from the mangrove to the banks of the Wouri.

Picture 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 heudoloti, Tilapia. Guineensis, Liza, Mugll, Elops, Cynoglossus as well as the juvenile stages of shrimp species of the genus Penaeus.

Table 4: local and scientific name of some species

Scientific name	local name
Pseudolithus elongatus	Bossu
Pseudolithus typus	Bar
Palaemon hastatus	Small shrimp
Arius heudeloti	Machoiron
Galeoides decadaglus	Capitaine
Cyoglossus Spp	Sole
Dentex angolensis	golden head fish
Lutjanus goreensis	Eglefin

1.4. Socio-economic and human environment

1.4.1. Demography and population

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 zone where the AFISA project is located, is situated in the Douala 1st sub division. 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.

1.4.2. Uses and Costums

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.

1.4.3. Housing Characteristics

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.

1.4.4. Economic activities

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

1.4.4.1. 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, the port has a surface area of 1000 ha, 13 multi-purpose warehouses and makes 12 millions of annual transit.

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

Picture 5 : Activities in the Douala autonomous port

1.4.4.2. Douala autonomous Port (administrative entity)

The autonomous Port is a public company managing a port area, with legal personality and management autonomy vis-à-vis its supervisory authorithy.

a) History

The Douala autonomous port was split into deveral entities, autonous ports operate the port and the port authorithy which controls the ports. The Douala autonomous port is a publicly-owned company with legal personality and cinancial autonomy.
Its head office is in Douala.

b) Characteristics and activities of DAP

The main characteristics are the following :

- Annual traffic capacity 7 millions tons ;
- 26 docks on 5,5 km long ;
- Surface area 400 ha ;
- 7 specialised terminals;
- 15 warehouses ;
- 65 ha of earthwork ;
- 25 km railway ;
- 20 km de asphalted roads.

The Douala Autonomous Port is responsible for the management, promotion and marketing of Douala-Bonabéri port.

Within the boundaries of the port area, the DAP is responsible of :

- General coordination of port activities;
- Equipment works, extension, improvement, renewal, reconstruction, maintenance of the port and its outbuildings and the creation and development of industrial estates;
- Safety and policing of outbuildings and port operations;
- Management, maintenance, and renewal of infrastructures and port equipments
- Protection of port environment;
- Project management of works entrusted to specialised contractors including dredging;
- Ensuring that the service provided and the related charges are appropriate;
- Leading the port community within the Port dvisory Council.

The Douala Autonomous Port is also responsible for managing public services such as roads and other networks, buoyage and navigational aids within the port d'area:

- Public maritime domain and coastal protection;
- Public waterways ;
- Maritime signaling service;
- River navigation services and related activities in particular, flood warnings and flood defences.

It is noted that these activities can be subcontracted. They remain state services managed by the DAP in collaboration with the admijistrations concerned.

1.4.4.3. 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.

Petit businesses is also very present in the area. These include stalls, drinks outlets, sand extraction units, dugout canoe manufacturing units, firewood sales points and restaurants. The motorbike taxi business is flourishing. Bike riding is a flourishing activity.

Some activities developped in Douala I subdivision

Canoe manufacturing unit

Sand extraction point

firewood Trade

Wood cuttings

Picture 6 : some economic activities carried out by people

1.4.4.4. Industrial activities around the projet site

Le site of the project is located in the port area. There we have operating sites of economic Douala International Terminals, offices, storage warehouses of various products.

1.4.4.4.1. Access to collective social services

1.4.4.4.2. 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 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.)

1.4.4.4.3. 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.

1.4.4.4.4. 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 Rimbabelles 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.

1.4.4.4.5. Access to drinking water and electricity

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

1.4.4.4.6. 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.)

1.4.4.4.7. Classification of waste found on the site

a) Solid waste

Waste can easily be identified. Within the construction and operating project of storage silos, solid waste identified are :

✓ **Construction phase**

During the construction of ifrastructures, painting, tilling, piping, joinery, roofing and electrical installations (TGBT, cables, table) will generate all kind of waste (construction , hazardous, biodegradables et non biodegradables). These are :

- Inert waste: concrete, brics, tar-free bituminous materials, soil and stones (including spoil but excluding topsoil) ;
- No- inert waste: metals and its alloys, raw wood, papers, cartons, plastics, paints, varnish, glue, water based-sealant (not having hazardous substances), cartridges containing chemical products, plaster, food waste, green waste.

✓ **Operating Phase**

During its functioning, the company will produce solid waste. It include :

- Office waste (papers, pen, printers' ink, defective office equipment etc)
- Electronic waste (defective computers, damaged electronic devices etc.)
- Biodegradable waste (food waste, green waste)
- Solid particules (dust) in suspension on air while manipulating wheat ;
- Wheat Particules;
- Protective equipment employees : gloves, masks, etc

b) Liquid waste (construction and operation)

Liquid waste is most often used waters and hazardous or special waste.

Used waters are liqued effluents from cleaning and maintenance of equipment, offices, machines, vehicles and other equipments and hazard or special waste are discharge of waste oil, hydrocarbons, printer ink etc

1.4.4.4.8. Waste management plan

A waste management plan is a strategy used by an organisation to eliminate, reduce and prevent waste. Generated waste by the project are made of :

- Construction Phase (Construction waste)

- Inert waste: concrete, brics, tar-free bituminous materials, soil and stones (including spoil but excluding topsoil) ;
- No- inert waste: metals and its alloys, raw wood, papers, cartons, plastics, paints, varnish, glue, water based-sealant (not having hazardous substances), cartridges containing chemical products, plaster, food waste, green waste.

- Operating phase
  - Office waste : it include (newspapers, magazines, papers capsules …), cartons, cartridge, defective electric equipment, plastics bottles, cans, coffee capsules, cups etc.,
  - Miscellaneous waste : it includes plastics, food waste, products from handling operations etc.
  - Maintenance waste of machines : made of sludge from d'hydrocarbons separators (valuable), engine oil, gearboxes and synthetic lubrificants from used oil of maintenance des charriots (recyclable), lead accumulators from handling equipment batteries (valuable) and fluorescents tubes from filament bubs (recyclable) etc.
  - Liquid waste from cleaning and maintenance of facilities, equipments and rolling stock (used waters).

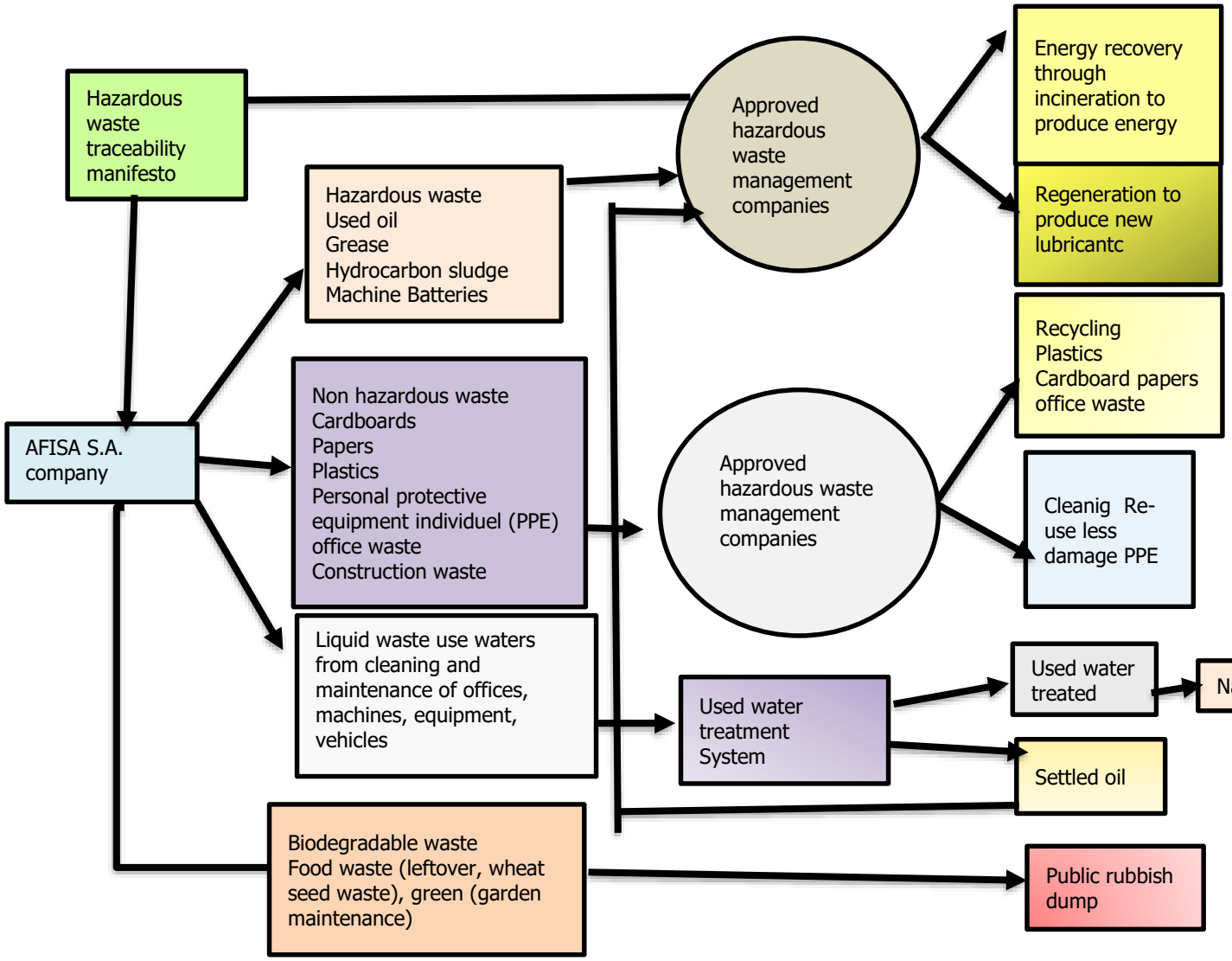


Figure 7 : simplified waste management of AFISA

Chapter.2 PROJECT DESCRIPTION

2.1. Introduction

Cereal storage units of grain are now more than ever necessary. This essentially dueto the large volumes produced, which need to be adapted to market requirement and therefore need to be stored. It is against this backdrop that AFISA want to build and operate 16 silos of a capacity of 80000 tons to store the wheat. The wheat 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 machines and equipment for the construction of silos. 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:

- Sixteen silos (16) in cylindrical shape in reinforced concrete and metal. These silos generally have juxtaposed cells of variables section and great height. At the base, it has emptying udders but closed in their superior part by floor on which the filling devices are installed.

The installation of silos involves steps :

- ✓ A reception pit F into whichbthe cereals are poured upon arrival ;
- ✓ An elevator E lifting the seeds from the pit to the upper level above the cells ;
- ✓ An upper conveying belt T conveying the seeds from their discharge from the elevator to the filling cells;
- ✓ Cells;
- ✓ an inferior conveying belt taking back the seeds from when empting the vidange cells.

The elementary diagram of a silo below

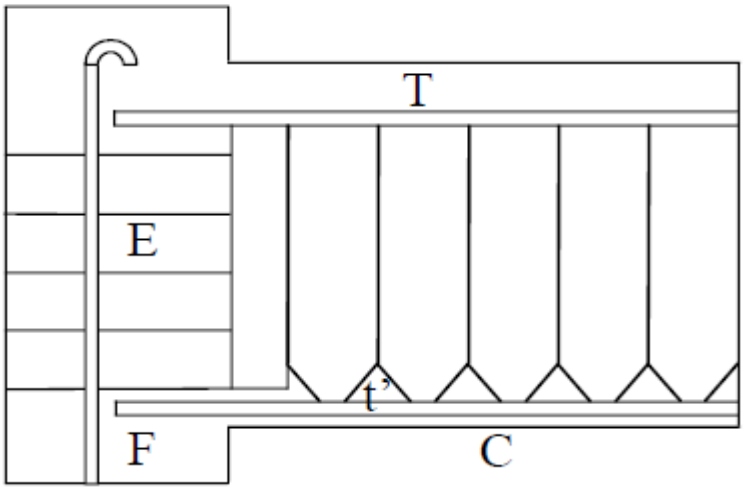


Figure 8: elementary diagram of silos

Figure 9 : view of metal Silos to build

AFISA equally intend to built on the site :

- Un warehouse for storing equipments and construction material;
- A workshop ;
- A changing room ;
- A water tank ;
- Drinking water pumping room ;
- An electrical control room.

2.2. 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

It is also colonised by human action and disappearing vegetation.

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 Cynometrahankei

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.

Picture 7 : 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.

2.2.1. Description of the planned facilities

2.2.1.1. Construction phase

2.2.1.1.1. Development works

Development works include :

- 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

2.2.1.2. Construction phase of silos

2.2.1.2.1. Construction Phase of units

Associated works at this level are : preparatory works stage and construction itself.

- Construction of silos in steps

The silos, to norms will be built according to the construction rules of art. they are :

- 8 silos of 5 tons each in phase 1 (see Blue color on the diagram)
- 4 silos of 5 tons each in phase 2 (see green color on the diagram)
- 4 silos of 5 tons each in phase 3 (see black color on the diagram)

The silos will be built in strict compliance of the architect site plan.

They are silage tanks in cylindrique form

- Layout structures
- Installation of piles and pouring of co crete abutments
- Building the bases of silos with concrete
- Assembly of metal parts
- Functionality Testing

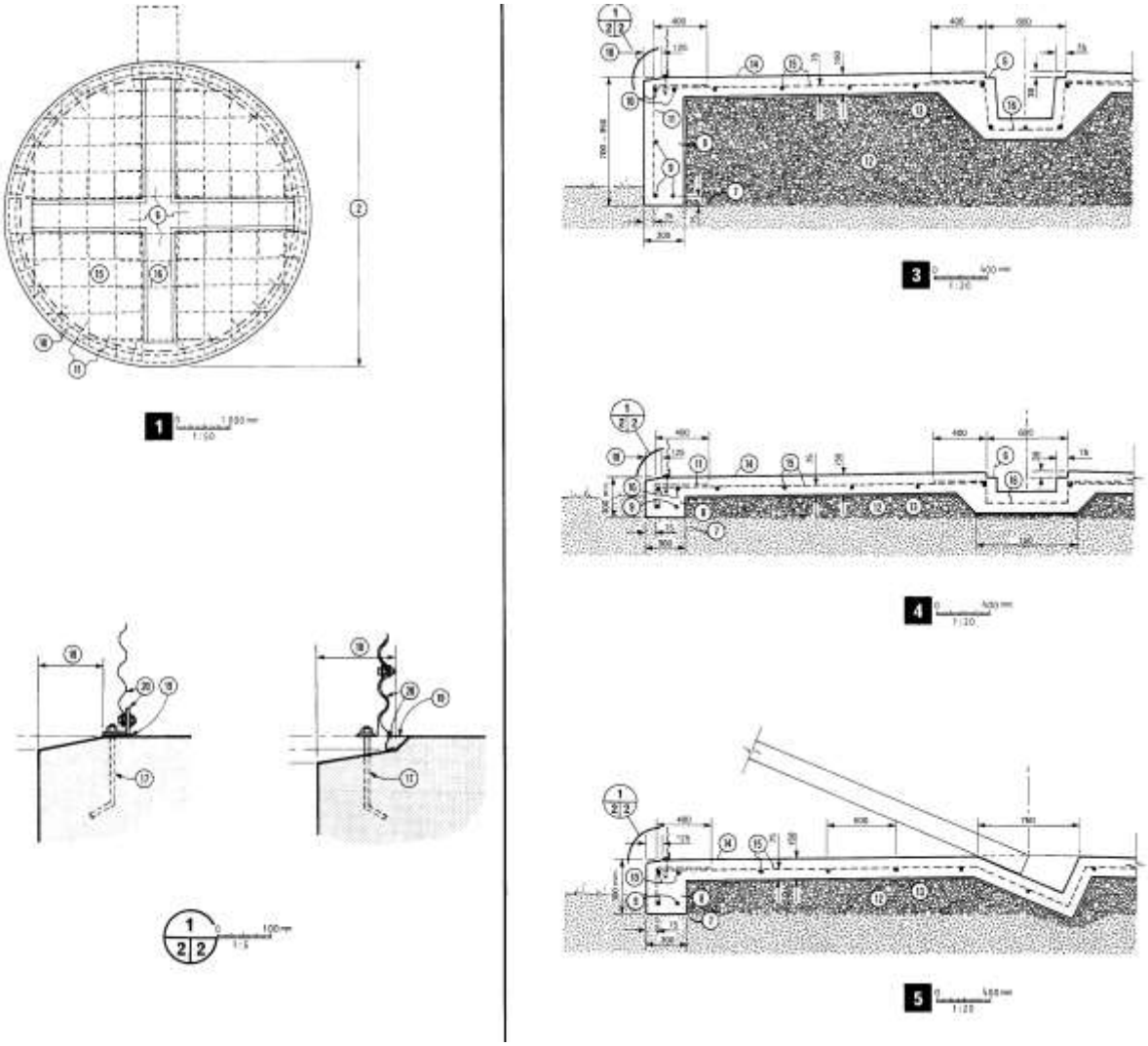


Figure 10: foundation Plan of silos

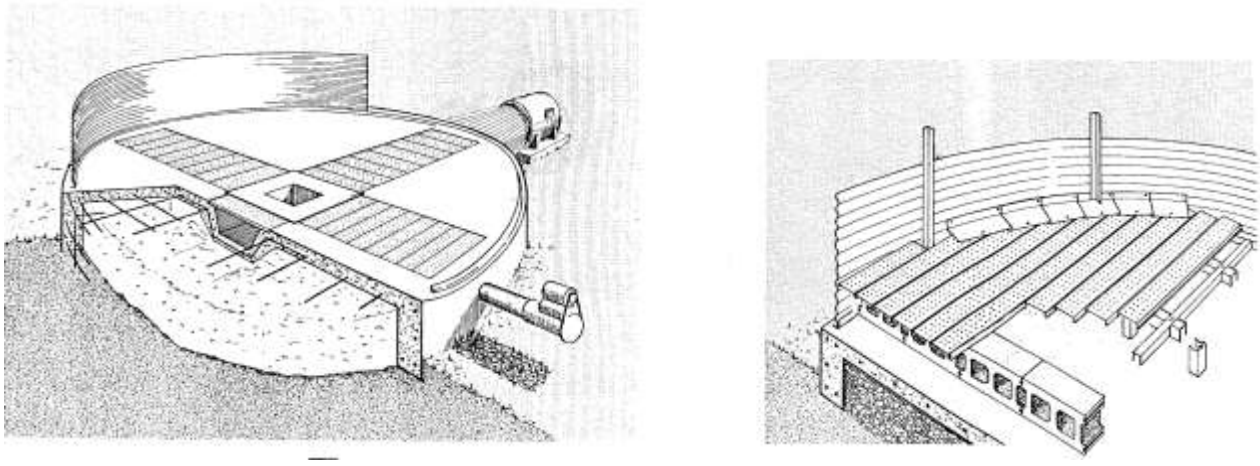


Figure 11: Base of silos

All the provisions specified in the desciptiver memo and on the plan must be complied with.

- Construction of conveying rails

- **Assembly of metal parts**

➢ Tagging and marking of traffic lane

2.2.1.2.2. Installation and assembly of equipments

After constructing, it follows :

- Transporting equipments and machines in the construction site,
- Installing machines and equipments,
- Testing the functionality and reliability,
- Activate units.

a) Used equipments

To assurer the functioning of facilities, the promoter aims to use equipments such as:

- 16 silos (80000 tons) in galvanized steel sheet and reiforced concrete ;
- Electrical installations (transformer stations, cables, electrical cabinet etc.)
- Water installations (water tank and hydraulic pump)
- Service and delivery vehicles;

b) Conical bottom Silos

They are generally small in diameter than flat-bottomed tanks and are maximum 12 metres high a capacity of 3450 cubis metres. The conical bottom silo is assigned to many industrial applications. It allows storage of fragiles products, affected to unloading process. This type of silo requires a special construction. The bottom is built differntly to the flat-bottomed so as to reduce its weight, which allows the bottom to be raised off the ground. Therefore the stored product is insulated from the ground, which prevents moisture from entering and preseves it. The emphasis is on ventilation. It is used within this project to store wheat seeds.

Table 5: equipments used

Name and brand	**Characteristics**	**models**
Food storage Silos	Form conical Height : 5-12 m Volum : 3650 m^3 Mass : 5000 tons	
Generators	Type : CAT Power : 1000 kVa Speed of rotation 1500 tr/min Tank capacity 1000 Litres Frequency : 50 Hz Optional automatic start Low energy consumption	
Water tank	Raised tanks In reinforced concrete Fed by pumping Thickness of water level 3-6 m height 2 - 3m	

The process used by AFISA includes traditional methods of préservation, through sophisticated means, the culture and history of wheat milling. This process involves the following phases:

2.2.2. Silos operation

This stage involves unloading the wheat received at the port into the boat by crane and suction.

2.2.2.1. Reception of raw matieral

Receipt of raw material is by sea using a bulk ship.

The wheat collected by a conveyor is directed towards one of the reception hopper. The latter is protected by a metal grid to remove big waste. With elevators (mechanical transporters), wheat is taking toward storage silos of 80000 tons capacity.

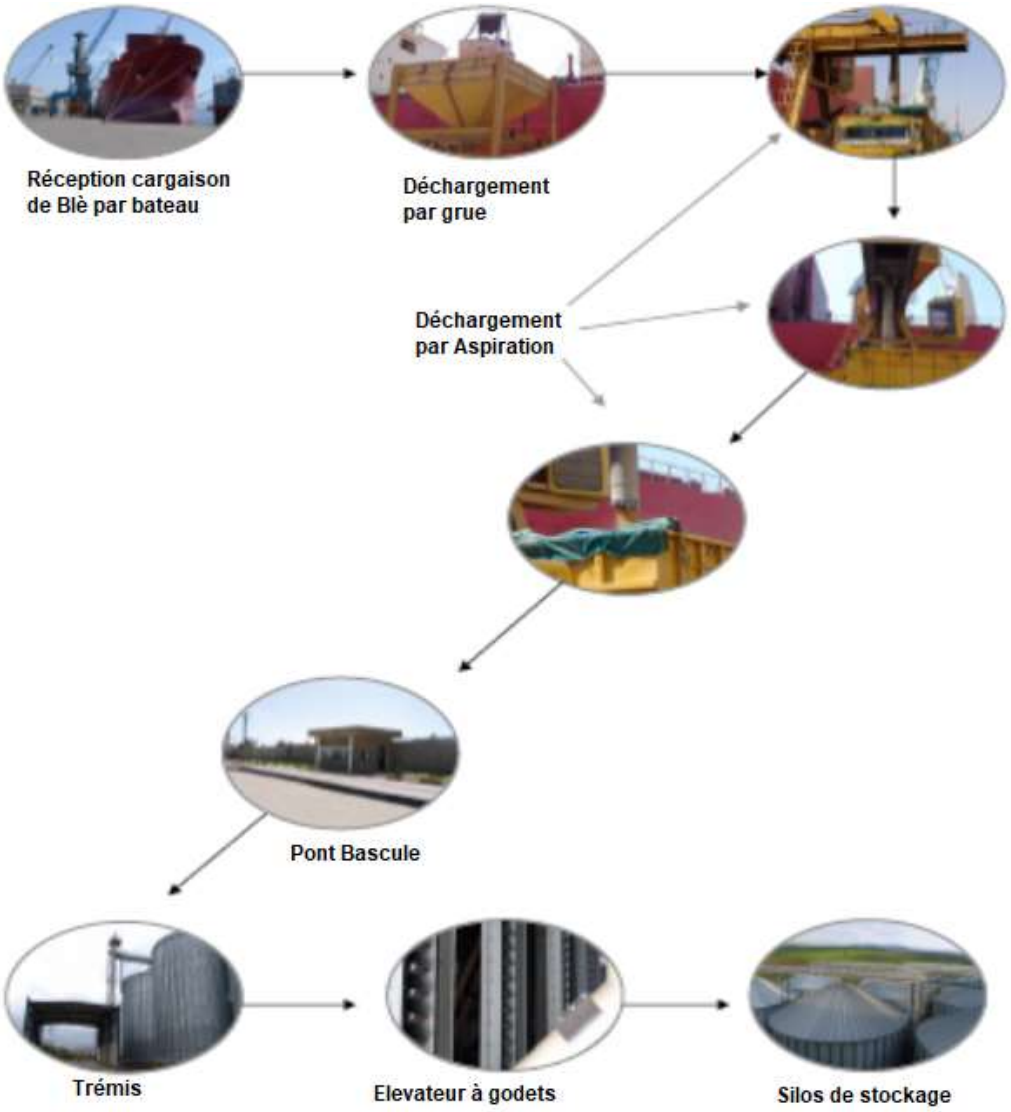
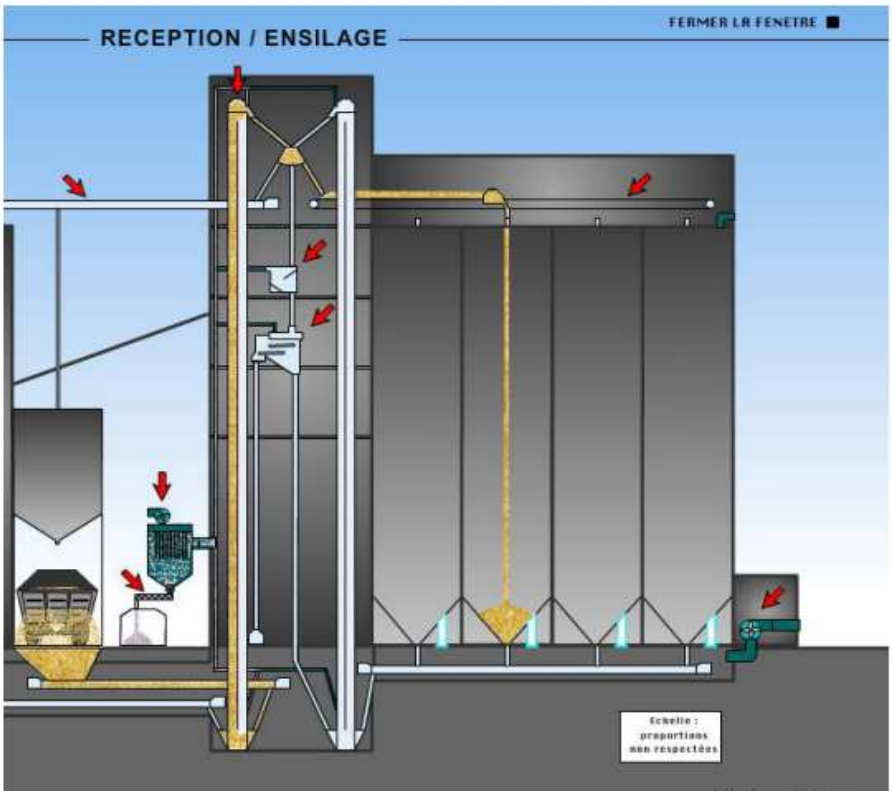


Figure 12: step of wheat reception

2.2.2.2. Operation of a silo

Silo operating method vary as much as the types of silage produced. An example, a brief presentation of the operation of a cereal silo. We have the handling tower, a structure separated from storage cells. Upon reception, the grain is poured from the truck to the pit of reception. An underground convoyor takes the grain to the lift in the handling tower. Above, another conveyor distributs in storage cells. In case there is no particular exigency, the grain is poured in the cell; other, more sophisticated devices are required if the grain is to remain intact and undamaged for susequent use. For the take over and expedition, the grain takes the reverse path via a conveyor in the central underground galery, the grain is taken in the handling tower, lifted, poured in the loading bucket of the lorry. Depending on cases, additional steps are carried at the arrival or departure in the handling tower.: cleaning, drying, calibration, …



2.2.2.3. Technical requirements

Depending on the material ensiled and its destination, technical requirements can differ. Take into consideration depending on case :

- Hygiene for human consommation products: protection against insects, de rodents…
- Tightness in terms of leakage to the outside of hazardous products including in the event of fire, earthquake, …
- Tightness against rain, air humidity, for sensitive products to humidity
- Sensitivity of silage matter to temperature
- The behaviour of silage during storage : seed germination (solidarity block formation…), fermentation (development of important temperatures …), other degradation phenomenon of silage
- The behaviour of silage for handling (filling/ drain) : flow behaviour, vaulting trend, plugging…
- Controlling the risk of dust explosion
- Development of CO_2

The fundamental requirement which is the resistance of the structure to the actions of the ensiled material will be the subject of other sheets of this serie.

2.2.3. 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 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).

Chapter.3 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 –processing unit storage tank.

3.1. 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.

3.2. International Conventions ratified by Cameroun

3.2.1. 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.

3.2.2. 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.

3.2.3. 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).

3.2.3.1. 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 construction and operation storage tank 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.

3.2.3.2. 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"

3.3. 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

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

3.3.1.1. Laws

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

It organise 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 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 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 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 company is required to comply with the above principles.

- **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°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 No. 2011/012 of 6 May 2011 relating 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° 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 N° 2018/020 of 11 Decembre 2018 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 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.

3.3.1.2. Decrees

- **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

- **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. 2013/0171/PM of 14/02/2013 establishing the modalities for carrying out Environmental and Social Impact assessment**

This decree sets out the content of the different types of studies, notably the summary and detailed environmental impact studies which this project is t 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.

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 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.

- **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.

3.3.1.3. Bylaws

- **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.

- **Order No. 0010/MINEP of 03 April 2013 on the organisation and functioning of Devisional 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 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 assessment**

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

- **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.

3.4. Institutional framework of the project and the ESIA

3.4.1. 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 ESIAs 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 manage 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.

Standards and Quality agency (ANOR)

Created by decree n°2009/296 of 17 september 2009, September 2009, the Standards and Quality Agency (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.

Development and Quality Division

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.

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.

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.4 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 storage tanks was marked by a field nission phase, which enabled the involvement of the various stakeholders, most especially the people of the canton Bell and Bali 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 being :

- 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 missions

4.2.1. Preparatory meetings for the meeting with the populations

As part of the preparatory phase of the public consultations, four 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 12 and 13 october 2023 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 13 to 20 November 2023 and on the 21 November with the local population, the elites, the village chief and their notability.

4.2.2. Individual Meeting and Public Consultation

4.2.2.1. Individual meetings of stakeholders in Douala

From November 16 to 20, 2023, the 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).

4.2.2.2. Public consultation

On the 21 Novembre 2023, the public consultation on the Environmental and Social Impact Assessment of the project to build and operate storage tanks 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;
- national anthem
- Presentation of the legal framework for ESIA;
- 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 3.25 p.m. with the opening words of the representative of the paramount chief, M MISSIPO Eric. In his opening remarks, he welcomed and wish successful meeting. The proposed agenda was adopted.

Afterwards, the company's representative M KOUMBIZICK took the floor to thank the participants for attending the meeting.

The consulting firm was then given the floor to present the legal framework of the study as follows : in its preamble, Cameroon constitution gives the right every citizen to a healthy environment. Added to that Laws have been enacted since 2005 on environmental protection regulating operations submitted to environmental evaluation. This recommends the presentation of the project, its impacts on local populations and their participation through public consultation.

After the presentation of the legal framework, the project followed. The company by name AFISA is a flour mill with a processing unit located in the Douala autonous port; the reason for our gathering is the construction of 16 storage tanks with a wheat capacity of 5000 tons each in 4 phases of 4 silos each for a total of 80000 Tons. The project is inside the port area near DIT company. The works consist of the construction of silos first. For it to effective, the piles have to be laid before the sheet metal works can take over.the wheat arrives in bulk by boat, then is directed to the silos by a conveyor belt where a cleasing system is installed to remove impurities before being transported to the mill situated at about 1km from the site.

A presentation of potential impacts was made by M TANGA. They are divided into 2 phases during construction and operation :

During construction, we will have :

- Availability of flour for consumption
- Availability of wheat bran for livestock (poultry)
- Risk of accidents during works (construction site accidents)
- Use of labour (subcontracting, handling, hiring equipment)

During operation, we wilk have :

- Job cuts due to the use of automatic system
- Dust emission;
- Increase waste load (wheat, scap metal sludge etc..)
- Occupational accidents
- Road accidents
- Water pollution from maintenance activities
- Food poisoning
- Accidental spills

- Atmospheric pollution from supply vehicles

After the exposé, M MISSIPO took the floor once more to moderate the exchanges. He made an appeal to participants to pose question for better understanding. Here below the worries of the participants:

- AFISA should ask for arable land and machinery to boost local production instea of imporring wheat
- What will the populations of canton Bell benefit from this project ? as regard identified impacts, what measures are recommended to manage the risks to the local population?
- How will dust emissions be managed when wheat is transported from hoppers to silos? What will happen to local producers in the face of massive importation of wheat?
- The seafront of the port was altered by the presence of silos, is it possible to build parks to compensate for the view of Wouri river by the inhabitants of the canton?
- Is AFISA project intended for local or external use also;
- Look also into the cases of unskilled jobs, the partnership between the canton and the company as regard the management of wheat waste produced by the company.
- The outcome of local production in 5 years?
- Is this meeting not organised because the company is sinking?

The following answers were given :

- The quantity of wheat used by AFISA cannot be locally produced. This concern leads us to pay particular attention to the local production of raw materials, but we need an appropriate policy to encourage and boost local production.
- Employment is open within the company, with priority given to locals with equal skills; the platform for collaboration is the chief executive office which will provide guidance according to profiles. For the time being, 8silos will be built and the duration of the project is 15 months.
- Within the company, the emphasis is on measures to protect the environment, people and the systematic wearing of PPE, control equipment for works at height, assessment of all risks and implementation of measures, incident reporting, installation of sedimentation barriers, medical check-ups for employees signposting of work sites….
- For the transfer of wheat, the height of falls will be reduced, the installations in place will expose the personnel on the ground less; a modern system in place to reduce and or contain potentially harmful dust.

Second wave of answers

- The wisl will be forwarded to the appropriate person.
- Wheat is an african issue, wheat processed in cameroon is primarily for local use and also for export.
- As far as employment is concerned, the company will do its utmost to provide the canton Bell with various job opportunities, but young people need to be properly prepared for the job, which is somewhat difficult; have a focal point file management.
- Local production is encouraged, and the more small producersget together, the more they will produce and stronger they will be.
- AFISA is a fast-growing company and is keen to increase its production capacity; to this end, priority is given to building the silos before the implentation of the first project.

In closing remarks, the delegatte' representative asked the consulting firm to work according to the new management outlined for the operation and to be specific in its mitigation measures. As for the company, it will have to set up a continuos ambient air monitoring system (to reduce pollution) in line with the government's recommendations and remain committed to implementing its management plan.

M MISSIPO summarised the presentations and thanked the participants for their attendance and active participation. The meeting ended at quarter past 5 pm

Number of participants : 28

4.3. Summary of opinions

The opinions of the reource persons interviewed are set out in the table below.

Table 6 : summary of resource persons

Name	Function / phone	Observations / summary
Robert ACHU	CBDD MINEPDED	We suggest that a fire-fighting system be intalled on the site and that a system be set up to manage to wheat seed in case of large importation
SOSSO Aurélie Ep. MANGAGUEMABE	Divisional Delegate of Commerce 655 080 887	Following the installation of flour meal, the storage silos will undoubtedly increase the production capacity of wheat, one of the most sought-after product in terms of food requirement. In addition, the emission of dust and pollution should be taken into account to protect the peace not only of the local consumers but also of employees.

		In the near future, we should consider replacing imported raw materials with loca products.
MISSIPO ERIC	Chief Representative	Viable, necessary and very useful project promising economic growth for ‘he people of the canton Bell, Cameroon and Africa. Consider creating parks to compensate for the landscape created by th installation of silos
ABATE CRISSY	Ingénieur environnement PAD Representantive	A Project that will contribute in its own way to economic growth by improving food security. Compliance with environmental requirement to mitigate the impact of the project. In addition,the company to sourcing local wheat, participate in the training of local farmers to improve production.

Picture 8: View of participants at the public consultation

Chapter.5 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 component 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 7 : Impact identification matrix

		BIOPHYSIC												HUMAN								
COMPONENTS OF THE ENVIRONMENT		Air			Waters				Soils			Biotopes			natural Resources	**Socio economic Aspects**			**Living envirnment**			**Heritage and Infrastructures**		
		Climate and Ozone layer	Atmosphere		Surface waters		Underground waters		Soil		Sub-soil	Aquatic Land Underground											
Main impact assessment criteria		Emission of greenhouse gases that deplete the ozone layer	Aptitude of the site to disperse pollutants	Air Quality	Average annual flow of the environment	Qualité of surface water	Characteristics of aquifers	Quality of underground water	Sensitivity to eosion	Soil Quality and use	Stability	Flora	Fauna	Protected and special areas	Rational managemen	Conflicts	local Economy / jobs	Health / Safety	Noise	Odors	Landscape Quality	Cultural and Archaeological patrimony	Real and corporeal estate assets	Equipments and public infrastructures
		1	2	3	4		5		6	7	8	9			10	11	12	13	14	15	16	17	18	19
Settlement Phase (installating the conversion unit)	**A**		X	X					X	X	X				X		X	X	X		X		X	X
Recruitment of labour	**1**																X	X						
Acquisition and transport of processing plant equipment	2	Xq	X	X					X	X	X				X		X		X		X		X	X
Installation of equipment	3		X	X					X	X	X				X		X	X	X		X		X	X
functional testing	**4**																	X	X					

Operating Phase of silos	**B**		X	X					X	X	X				X		X	X	X					
Wheat reception	**1**			X					X	X								X	X					
Packaging ,storage,delivery	**4**		X	X					X	X	X				X		X	X	X					
Operation of generators	**5**		X	X													X	X		X				
Maintenance of facilities	**6**								X	X	X													
Traffic	**7**		X	X					X	X	X						X	X		X				
decommissioning Phase	**C**	X	X	X					X	X	X						X	X	X	X	X		X	X
Shutdown of storage activities	**1**																X							
General cleaning of Silos	**2**	X	X	X					X	X	X						X	X	X		X			
Dismantling and transporting equipment	**3**		X	X					X	X	X						X	X	X					
Construction site	**4**		X	X					X	X	X						X	X	X	X	X		X	X

5.3. Identification of des impacts

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.

5.3.1. Criteria Of Impacts Characterisation

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 8: : **Qualification and symbolism of characterization parameters**

Parameters		Qualification and symbolism
1	Scope or extent	- Regional (*R*) - Local (*L*) - National (*N*)
2	Duration	- Short term (Ct) - Meduim term (Mt) - Long term (Lt)
3	Intensity	- High (h) - Medium (M) - Low (l)
4	Occurrence	- Certain (Cer) - Likely (li)
5	Commutativity / Interaction	- Yes - No
6	Value	- Hautement valorisé (Hv) - Valuable (V) - Non valuable (Nv)
7	Reversibility	- Reversible (Re) - Irreversible (Ir)

5.3.2. 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 9: Absolute Impact Significance matrix

Intensity	Scope	Duration	Absolute importance
High	Regional	Long term	Major
		Meduim term	Major
		short term	Major
	Local	Long term	Major
		Meduim term	Average
		short term	Average
	Punctual	Long term	Major
		Meduim term	Average
		short term	Minor
Medium	Regional	Long term	Major
		Meduim term	Average
		short term	Average
	Local	Long term	Average
		Meduim term	Average
		short term	Average
	Punctual	Long term	Average
		Meduim term	Average
		short term	Minor
Low	Regional	Long term	Major
		Meduim term	Average
		short term	Minor
	Local	Long term	Moyenne
		Meduim term	Average
		short term	Minor
	Punctual	Long term	Minor
		Meduim	Minor
		short term	Minor

5.3.2.1. 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

5.3.3. 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;

5.4. Identification of environmental and social impacts

5.4.1. 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.

5.4.2. Project activities and inputs causing impacts

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

Table 10: Activities causing impacts

Project phase	Activities causing impacts
Construction Phase (setting up the site and building of Silos (civil engineering work, laying the foundations, making and pouring the concrete, metal assembly,roofing and finishing works)	✓ Recruitment of skilled and unskilled labour ✓ Purchase and transport of equipments for the construction of silos ✓ Equiment Installation, assembly and fitting ✓ Functional Test ✓ Degradation of water quality ✓ Degradation of soil quality ✓ Risk of work-related accident ✓ Noise pollution ✓ Production of solid and liquid waste
Operating Phase (wheat storage and removal **)**	✓ Wheat reception (dumping wheat into a reception pit) ✓ Loading seeds onto the conveyor ✓ Loading seed onto a lift in the handling tower ✓ Distribution of wheat seeds in storage bins ✓ Seed Control ✓ Treatment (cleaning, drying, pest control…) ✓ Reloading seeds onto the conveyor ✓ Transport of seeds to the lift in the handling system ✓ Unloading seeds into loading bins ✓ Distribution in lorries for delivery ✓ Operating generators ✓ Maintenance of facilities ✓ Traffic ✓ Management of waste and various emissions
Decommissioning Phase de (Dismantling facilities)	✓ Stopping activities related to stockage; ✓ General cleaning of silos; ✓ Dismantling and transport of equipment; ✓ Rehabilitation of the site

5.5. 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 11: **Impacts according to project activities and phases**

CONSTRUCTION PHASE		
Project phase	**Activities causing impacts**	**Impacts**

construction Phase (Installation of silos)	Recruitment of skilled and unskilled labour	✓ Increase in household income ✓ Job creation ✓ Growth of local economy ✓ Risk of conflict with other port stakeholders
	Construction of piles	✓ Degradation of the water quality ✓ Degradation of the soil quality ✓ Risque d'accident de travail ✓ Noise pollution
	Civil engineering works (laying the foundations, making and pouring the concrete, metal assembly roofing, and finishing works	✓ Degradation of the water quality ✓ Degradation of the soil quality ✓ Risk of work-related accident ✓ Noise pollution ✓ Production of solid and liquid waste
	Installation of equipments	✓ Risk of work-related accident ✓ Noise pollution ✓
	Functional Test	✓ Risk of work-related accident ✓ Risk of spill during the maintenance of equipments ✓ Noise pollution
	purchase and transport of equipments	✓ Risk of road accident ✓ Noise pollution ✓ Degradation of air quality by gases ✓ Risk of spill during the maintenance of equipments
Operating PHASE		
	Wheat reception	✓ Risk of work-related accident ✓ Risk of spill ✓ Risk of explosion
	Cleaning	✓ Noise pollution ✓ Risk of degradation of air quality by dust ✓ Risk of degradation of air quality by wheat particles
	Treatment (pest control, drying …)	✓ Risk of respiratory disease ✓ Degradation of the quality of air

Operating Phase of silos	Wheat reception (dumping wheat into a reception pit, Loading seeds onto the conveyor, Loading seed onto a lift in the handling tower, Distribution of wheat seeds in storage bins, Seed Control, Treatment (cleaning, drying, pest control…), Reloading seeds onto the conveyor, Transport of seeds to the lift in the handling system, Unloading seeds into loading bins	✓ Risk of explosion ✓ Fire hazard ✓ Noise pollution ✓ Risk of work-related accident ✓ Risk of cross-contamination ✓ Degradation of the quality of air (presence of particules in the air) ✓ Risk of seed contamination ✓ Equipment malfunction
	Storage	✓ Risk of spill ✓ Risk of wall failure
	Livraison Trafic des véhicules	✓ Noise pollution ✓ Risk of road accident ✓ Degradation of air quality by exhaust gases
	Recruitment of skilled and non silled labour	✓ Increase of household income ✓ Job creation ✓ Growth of local economy ✓ Risk of conflict with other stakeholders in the port
	Maintenance of facilities	✓ Risk of oil spill ✓ Risk of work-related accident
	Management of waste	✓ Production of solid waste (debris from packaging, wheat bran, office waste etc.) ✓ Visual and olfactory nuisance
	Generator operation	✓ Fire hazard ✓ Soil Pollution by hydrocarbon (accidental spill) ✓ Degradation of air quality (emission CO_2 and noise)

Project Phase	Activities sources of impact	Impacts
DECOMMISSIONING PHASE		
Decommissioning Phase (dismantling of facilities)	Shutdown of storage activities	✓ Loss of job ✓ Risk of conflic with other stakeholders in the port
	General cleaning	✓ Production of solid and liquid waste ✓ Risk of hydrcarbons spill
	Dismantling and transporting equipments	✓ Risk of work-related and road accident ✓ Production of solid waste ✓ Noise pollution ✓ Degradation of the air quality
	Rehabilitation the site	✓ Production of waste ✓ Olfactory and visual Nuisance

5.6. Description and assessment of project impacts

5.6.1. Impact in the construction phase

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 aliénas 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 soil degradation

The first step is the laying of foundations of the wheat storage tank. However, other activities during the construction phase may contribute to the exposure of the surface layer of the soil. This is the case for eartworks and levelling. During the rains, the slopes and bare land are subject to erosion, whichbcan be seen in the gullyingand degradation of the soil. The maintenance and upkeep of machinery can lead to soil contamination by hydrocarbons. The impact is negative and direct. Given that the impact may persist after the work has been completed, it is has been judged of long duration. With low intensity, the project area is flat. The extent is punctual, reversible. The soil is a valuable component of the environment. The assessment criteria show, the absolute importance of the impact is minor. It is also the same with the **relative importance** considered **minor.**

C.4. Impact related to the realisation of piles

Construction piles are defined as construction elements made of wood concrete steel or mix to support a building. They are mainly used when the ground cannot support the stresses associated with the mass of the structure, but also to reinforce existing foundations. They are carried out by penetrating the soil with an auger to a calculated depht. The auger is extracted to remove the drilled soil. During auger extraction, the concrete or grout is pumped and injected at low pressure through the core of the auger. The construction of piles will lead to the deterioration in the quality of the soil while digging and also in the quality of the water, as it will encourage the deposit of sediments in the wouri river. It can also be the cause of workplace accidents during drilling operations. The impact is negative and direct. It has a short duration, meduim intensity, the project area is flat. The scope is assessed punctual, reversible. The soil is a valuable component of environment. The assessment criteria reveal that the absolute impact is minor. Therefore, the **relative importance** is considered ***minor***.

C.5 Impact related to degradation of surface water quality (sedimentation and disturbance of the flow regime of watercourses and presence of waste)

Material from earthworks the shaping of the platform and embarkments, the installation of diversions in line with the structures to be built, and work on piles and excavations can be washed away by water and deposited in the Wouri riverbed by sedimentation. This phenomenon results not only in the reduction of drain beds, which can lead to flooding, but also in the disruption of drainage area vital for the ecological survival of watercourses. Works carried on the site can favor pollution of river wouri nearly located to the work site, pby construction waste (wood debris and concrete, cardboards etc.) and food waste. The various products (Fuel, lubricants, drain oil and paints) that can

be accidentally spilled on the ground can be washed into river Wouri. This impact is negative and direct. It likely to occur, short term, because it happens during the construction phase. Its intensity is high, punctual and likely. It is reversible with a cumulative character, because it will amplify the contamination of surface water in the project area. As a result it is assessed ***major relative importance.***

C.6. 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 ucrative 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 **low relative importance**.

C.7. 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.8. 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 pollution;
- 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.9. 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.

C.10. Impact of welding work

Welding is one of the most important trade in many areas of actitivity such construction, building, public works, metallurgy and industrial mainteance. Welders are therefore required to carry out their work in the worksho or on site. Welding consists of bringing together two metal elements of a similar nature to ensure continuity. This operation is carried out using activation energy to bring the edgesof the two parts to be weldedup to the require melting temperature.

Welding actities are carried out in different milieu such worksops, site or even in confined spaces. As a result, a number of risks can jeopardize the health and safety of welding operators who carry out preparation and finishing operations on welde parts such as cutting, grinding, and cheesing. These risks include :

- Chemical risks associated with welding fumes (welding fumes can cause illnesses such as asthma, chronic bronchitis, pneumoconiosis and metal fever etc.) ;

- Therma risks associated the heat generated by welding processes (during welding activities, welders use flames, pressurised gases or electric current to weld metals.the heat sources produce arcs, sparks and splashes of spatter and slag, which represent fire or explosion risks, as well as a risk of skin burns for welders following contact with metal parts heated to high temperature.
- Ocular risks linked to the radiation emitted damage (eye damage caused by ultraviolet and infrared radiation).

The impact is negative, direct, longue term, local in scope, high itensity, likely to occur, irreversible, highly valued and major absolute significance. Therefore, the relative importance of this impact is considered **major**.

C.11. Risk of accident when working at height

Falling is one of the main risks when working at height. in fact, many workers are required to work above ground level, such as buildings and construction workers, electrical network operatorsand maintenance technicians etc.

A fall from a height is caused by a person working above ground level, near a hole or pit becoming unbalanced and violentlynimpacting the ground. The consequences of falls from height are often very serious for those who suffer them, and are one of the main causes of permanent disability, lost time and fatal workplace accidents. This impact is negative, indirect, long term, local scope, high intensity, likely to occur, reversible, highly valued and major absolute significance. Therefore, the **relative importance** of this impact is considered **major**.

C .12. Risk associated with the storage of hazardous products

Improper storage can have serious consequences : a dangerous chemical reaction, the release of large quantities of noxious products, or even an explosion or fire, poisoning, a fall from a height, injuries. This impact is negative, indirect, long term, local scope, high intensity, likely to occur, reversible, highly valued and major absolute significance. Therefore, the **relative importance** of this impact is considered **major**.

C.13 Production of waste

During construction of works (silos, pipelines, technical buildin etc.), painting, tilling, channels, joinnery, roofing and électrical d'installations (TGBT, cables, table) will produce waste of all kind (BTP, dangerous, biodegradables et non biodegradables). It involves :

- Inert waste: concrete, brics, tar-free bituminous materials, soil and stones (including spoil but excluding topsoil) ;

- Non inert waste: metals and alloys, raw wood, papers, cartons, plastics, paints, varnish, glue, water-based sealant (not cotaining hazard substances), cartridge free from harmful products, plater, food waste, green waste (leaves branches and tree trunc).

If waste is not managed, it causes a nuisance for other port stakeholder thus a visual nuisance. The landscape will be affected by litter and will be less pleasant to look at. The impact on waste production is negative direct, long term, punctual, average intensity major absolute significance. Likely to happen, reversible and valued. Therefore the relative importance ***is assessed medium.***

5.6.2. Impacts during operating phase

E.1. Cumulative Impact to the degradation of the quality of air

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 à 50dB : light noise;
- 50 à 70dB : annoying noises;
- 70 à 90dB : tiring noises;
- 90 à 120dB : dangerous noises;

- >120 dB : 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 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.**

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E.8. Impact due to poor wheat storage and other odours

The impact of odours due to poor storage conditions for wheat seeds, which can lead to putrefaction and olfactory nuisances.

The operation of fuel-powered equipment and generators is likely to emit odours. However, these odours are not significant and could not be harmful to employees. They are negligeable sont donc négligeables. Olfactory nuisance is a negative impact, direct, average term, punctual, minor intensity, likely to occur and reversible. These criteria give the impact a minor ***absolute and relative*** **importan*ce***.

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. Analysis of the cumulative impacts linked water pollution

Close to the project is river Wouri, where the boat that will supply the wheat will be stabilised. Dust and other impurities from the cleaning of the wheat could alter the quality of water in the river.

Transport activities could be expanded as a result of the use of the road by all the companies located in the area. This can increase the risks of accident, noise pollution and the degradation

of the road. These impacts are negative, direct, long term local scope, high intensity, likely to happen, irreversible/reversible and of **major absolute** and **relative importance*.***

E.11. Cumulative impact of increased road traffic

The presence of distribution lorries to supply the company with wheat will undoubtedly lead to increase in traffic. The port is, currently home to a number of transit. The presence of all these companies has meant that there is a lot of traffic in the port and its environs. The increase of traffic may cause many road accidents routiers as well as on local population as on those working in the port. The impact is negative, long term, local scope, high intensity. It is major absolute, likely to occur, non valued and irreversible. It is assessed ***relative major.***

E.12. Impact to conflict between employes and other stakeholders in the port

The port can be considered as an industrial zone because it harbour many companies carrying various activitues. The presence of many people on site can cause chocs between individuals, create discupes and conflicts among the personnel or between its personnel and other stakeholders. This impact is direct, negative, medium intensity average, short term and punctual, probable, non valued and reversible. These criteria give the impact a ***relative meduim*** importance.

E.13. Wheat storage risk

When storing wheat, a number of risks could arise. These risks are :

- Fire (it can linked to the combustibles products stored, or to the self-heating of wheat stocks in silos) ;
- Risk of skin damage from chemicals (widely used cleaning products, detergents et disinfectants, contain chemicals that are harmful to the skin and mucous membranes
- Risk of poisoning from chemicals (insect infestation requires treatment with insecticide sprays or toxic fumigation gases).
- Risk of food poisoning: any biological, cheùmical or physical agent present in the food or condition of the food that may have an adverse effect on health. These include bacteria, viruses, d parasites, chemical substances, and foreign bodies. The danger concerns the consumer with consequences in terms of pubic health but also by affecting his economic value.

  The impact is negative, direct, long duration local, strong intensity, certain occurrence, irreversible/reversible and absolute importance and relative major.

E.14. Impact related to landscape modification

The disruption of landscapes and natural environments will be observed, as the worksite will cause major alterations to the landscape and the local ecosystem.

Noise generated by construction work can disturb local communities and wildlife. This impact is direct, negative, short duration, punctual extent, low intensity. It is judged meduim absolute importance. It is likely occurrence, non valuable and reversible. it is asessed ***minor relative importance.***

5.6.3. Impacts in the dismantling or restoration phase of silos

F 1 : Risk of environmental pollution

The aim of the silo rehabilitation operations will be to bring the facility to a state of decontamination compatible with the reuse of the silos. If this objective is not achieved at every point in the facility, tthre is a high risk of environmental pollution or contamination of future stored foodstuffs. The impact is negative, direct, long duration, punctual extent, meduim intensity, likely occurrence and reversible. All these characterisation criteria de caractérisation confer the impact a ***relative absolute importance considered meduim***.

F 2 : Impact related to loss of jobs

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 of handling equipment.

The dismantling of silos is likely to produce solid waste. The dismantling of the roof with the cladding and everything around the break in the concrete tha makes up the silo.

Solid waste are pieces of equipments, concrete, roof and wood debris. Concerning liquid waste, they are used waters from cleaning and facilities maintenance. The impact is direct, negative, high intensité, long duration and regional extent. Following this characterisation the

impact is major absolute importance. It is likely to happen and highly valued and assessedas ***major relative importance.***

F 4 : Impact related to the degradation of air quality

When silos are no longer in use, silo dismantling activities such as the breaking the concrete and transportation of equipment can alter the quality of ambient air. The noise emitted during the dismantling of equipments will disrupt 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 ihenmpact has been assessed as **minor.**

Table 12: Project impact assessment matrix

ELEMENTS DU MILIEU		SOURCES OF IMPACT	code	IMPACTS		PARAMETER OF CARACTERISATION							ASSESSMENT			
					Nature	Interaction	duration	Scope	Intensity	Importance absolute	Occurrence	Reversibility	Cumulative	Value	Importance relative	Significance
CONSTRUCTION PHASE																
Physical environment	Air	Gas emission, Dust	C.1	Degradation of air quality by dust and exhaust fumes	-	D	Ct	L	Med	Med	C	Rev	yes	Nv	Moy	yes
		Degradation of air quality	C.2	Noise pollution	-	D	Ct	P	Med	Med	C	Rev	No	Nv	Moy	yes
	Soil	foundation, earthworks, levelling	C.3	Degradation of the quality soil	-	D	Ct	P	Min	Med	C	Rev	No	Nv	Min	No
		Realisation of piles	C.4	Degradation of the soil quality and risk of accident	-	D	Ct	P	Min	med	C	Rev	No	Nv	Min	No
	Water	Spill on surface water by run-off water from hydrocarbons and waste the construction site	C.5	Degradation of the quality of surface water	-	D	Ct	P	F	Med	C	Rev	Non	Nv	Med	yes
Human environment		Recruiting the workforce Installation of plant equipment Testing the operation of machine	C.6	Increased income for local people	+	In	Ct	L	Med	Med	C	Ir	yes	Hv	Med	yes
			C.7	Job creation	+	D	Lt	R	Med	Maj	C	Ir	No	Hv	Maj	Yes
			C.8	Risk of physical injury	-	D	Lt	P	F	Moy	Pro	Ir	No	Nv	Med	Yes
			C.9	Occupational health and safety risk	-	D	Lt	L	F	Maj	lik	Ir	No	Hv	Maj	Yes
			C.10	Impact to welding works	-	D	Lt	L	F	Maj	lik	Ir	No	Hv	Maj	Yes
Human environment			C.11	Height works related accident	-	D	Lt	L	F	Maj	lik	Ir	No	Hv	Maj	Yes
			C.12	Risk of explosion, skin irritation by chemical products and respiratory poisoning	-	D	Ct	P	Min	med	C	Rev	No	Nv	Min	No
			C.13	Waste Production	-	D	Lt	L	med	med	lik	Rev	No	Hv	Moy	Yes

ENVIRONMENTAL ELEMENTS		SOURCES of IMPACTS	code	IMPACTS	CHARACTERISATION PARAMETER								ASSESSMENT			
					Nature	Interaction	Duration	Scope	Intensity	Absolute Importance	Occurrence	Reversibilities	Cumulative	Valeur	Relative Importance	Significance
Operating phase																
Physical environment	Air	Dust emission, gas emission and boiler smoke	E.1	Degradation of air quality	-	D	Lt	L	Med	Med	C	Rev	Yes	Hv	Moy	Yes
Human environment	Accident	Operation of production units	E.2	Generation of liquid solid waste	-	D	Lt	P	F	Med	Pro	Rev	No	Nv	Med	Yes
		Operation of facilities	E.3.	Risk of road accidents due to increased traffic	-	In	Lt	L	F	Maj	Pro	Ir	No	Nv	Maj	Yes
			E.4.	Accident to persons and property on the operating site	-	D	Lt	P	F	Med	Pro	Ir	No	Nv	Moy	Yes
			E.5	Risk of explosion	-	D	Lt	P	F	Maj	Pro	Rev	No	Nv	Maj	Yes
			E.6.	Risk of fire	-	In	Lt	P	F	Med	Pro	Rev	No	Nv	Med	Yes
	Health	Operation of facilities	E.7	Noise pollution	-	D	Mt	P	Med	Med	C	Rev	No	Nv	Med	Yes
			E.8	Olfactory pollution	-	D	Mt	P	f	Min	C	Rev	No	Nv	Min	No
			E.9.	Risk of equipment malfunction	-	D	Ct	P	F	Min	Pro	Rev	No	Nv	Min	No
	Employment		E.10	cumulative Impacts on water pollution	-	D	Lt	L	F	Maj	C	Rev/Ir	Yes	Nv	Maj	Yes
			E.11	Risk of interaction with other companies	-	D	Lt	P	F	Med	Pro	Rev	No	Nv	Med	yes
			E.12	Cumulative impact (road accident, noise pollution)	-	D	Lt	L	F	Maj	C	Rev/Ir	yesi	Nv	Maj	yes
			E.1 3	Risk related to wheat storage	-	D	Lt	L	F	Maj	C	Rev/Ir	yesi	Nv	Maj	yes
			E.14	.lanscape Modification	-	D	Ct	P	F	Min	Pro	Rev	No	Nv	Min	No

ENVIRONMENTAL ELEMENTS		SOURCES of IMPACTS	code	IMPACTS	CHARACTERISATION PARAMETER								ASSESSMENT			
					Nature	Interaction	Duration	scope	Intensity	absolue Importance	Occurrence	Reversibilities	Cumulative	Valure	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	Med	Moy	Pro		No	Nv	Med	Oui
		Production shutdown	F 2	Loss of jobs	-	D	Lt	P	Med	Moy	C	Rev	No	Hv	Med	Oui
		Dismantling of equipments Cleaning of the site	F 3	Generation of solid and liquid waste	-	D	Lt	R	F	Maj	Pro		No	Hv	Maj	yes
		Restoration of site	F 4	Degradation of air quality'	-	D	Ct	P	Moy	MIn	C	Rev	No	Nv	Min	No

Legend

Nature	Interaction	Duration	Extent	Intensity	Occurrence	Reversibility	Importance	Value
+ (positive) - (negative)	D (direct) I (indirect)	st (court term) Med (moyen)	P (punctual) L (local) R (regional)	S (strong) w (weak) Med (meduim)	lik (likely) C (certain)	Rev (reversible) Ir (ireversible)	Min (minor) Maj(Major) Med (meduim)	Nv (non valued) Hv (highly valued)

5.7. 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 13: Summary of project impacts and risks

PHASE DE CONSTRUCTION			
Environmental components	Negative and positive impacts/risk	**Criteria**	Assessment
Air	Degradation of the air quality	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Short • Medium • Local • Likely • Medium
Soil	Degradation of the soil quality	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Short • Weak • Punctual • Likely • **Minor**
Water	Degradation of the quality of de surface water	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Short • Strong • Punctual • Likely • **Major**
Human	Nuisance pollution	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Short • Strong • Meduim • Certain • **Meduim**
	Risk of personal injury	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • **Meduim** • Strong • Punctual • Certain • **Meduim**

Human	Increase of local populations income	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Indirect • Positive • Short • Meduim • Punctual • Likely • **Meduim**
	Temporal Job Creation	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Indirect • Positive • Short • Meduim • Regional • Certain • **Meduim**
	Health and safety at workplace	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Indirect • Negative • Longue • Strong • Local • Certain • **Major**
	Impact related to welding	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Local • Certain • **Major**
	Height work related Accident	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Local • Certain • **Major**
	Risk related to storage of hazardous products	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Local • Certain • **Major**

OPERATING PHASE			
Components of the environment	Negative and positive impacts/risk	Criteria	Assessment
Air	Degradation of the quality of air	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Medium • Local • Certain • **Moyenne**
Water	Degradation of the quality of surface water	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Courte • Strong • Punctual • Likely • **Major**
Human	Generation of solid and liquid waste	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Strong • Forte • Punctual • Certain • **Major**
	Risk of road accident	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Indirect • Negative • Long • Strong • Local • Likely • **Major**
	Risk of personal injury	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Punctual • Likely • Medium
	Risk of explosion	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Punctual • Likely • **Major**
	Risk of fire	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Indirect • Negative • Long • Strong • Punctual • Likely • Medium •
	Nuisance pollution	• Interaction • Nature	• Medium • Medium

		• Duration • Intensity • Scope • Occurrence • Importance	• Punctual • Certain • Medium •
	Olfactory Nuisance	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Weak • Medium • Punctual • Certain • **Mineure**
Human	Risk of equipment failure	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Courte • Strong • Punctual • Likely • **Minor**
	Analysis of cumulative Impacts on water pollution	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Strong • Forte • Local • Likely • **Major**
	Cumulative Impact linked to the increase of road traffic in the port zone	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Local • Likely • **Major**
	Risk related to wheat storage	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Local • Likely • **Major**
	Risk of interaction with other companies	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Punctual • Likely • Medium
	Lanscape Modification	• Interaction • Nature • Duration • Intensity • Scope • Occurrence • Importance	• Direct • Negative • Courte • low • Punctual • Likely • **Minor**

CLOSURE AND DISMANTLING PHASE			
Component	**negative and positive Impacts /Risque**	**Criteria**	Assessment
Human	Risk of environmental pollution or contamination of people	• Interaction • Nature • Duration Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Medium Punctual • Likely • **Meduim**
	Loss of jobs	• Interaction • Nature • Duration Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Medium Punctual • Certain • **Medium**
	Generation of Solid and liquid waste	• Interaction • Nature • Duration Intensity • Scope • Occurrence • Importance	• Direct • Negative • Long • Strong • Regional • Likely • **Major**
	Degradation of air quality	• Interaction • Nature • Duration Intensity • Scope • Occurrence • Importance	• Direct • Negative • Short • Medium Punctual • Certain • **Minor**

5.8. Mitigation and improvement measures for project impacts

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

Table 14: Measures in the construction phase

Impacts		Mitigation or improvement measure
Noise pollution and air quality degradation	C.1	Permanent maintenance of vehicles and other equipment
		Use low-noise machinery and equipment
		Equip workers at risk with helmets and/or earplugs
Noise pollution	C.2	Defining the noise nuisance zone (noise mapping)
		Equip workers at risk with helmets and/or earplugs
		Use machinery in good working order
Degradation of the soil	C.3	Training staff accidental hydrocarbons spill
Risk related to the realisation of piles	C.4	Developing backfill and embarkment system
		Training staff in accident risks
Degradation of the quality of surface water	C.5	Evacuate material from earthworks demolitions, drainage out of the work site when required
		avoid deposit at less than 100 m from streams
		Thoroughly compact and stabilise diversions in line with the structures to built
Job creation	C.7	Give priority to recruiting locals with equal skills
		Have contractors publish the condtions for recruiting employees
		Respect the clauses of the contracts signed with the workers ;
Risk of personal injury and materials accident	C.8	Recruit a permanent HSSE team (Hygiene, health, safety, Environment)
		Have an infirmary for first aid and occupational medical doctor
		Training staff in accident risks
Health and safety risks	C.9	Organise screening sessions of workers on STI/AIDS
		Put at the workers disposal clean water and soap for hand washing
		Put at the workers disposal hydro alcooliques gels to desinfect the hands
		Recruit a doctor and occupational nurse
		Sensitise staff on barriers measures (COVID 19)
		Souscribe a health insurance for employees
		Take care of HIV positive workers
Risk related to welding works	C.10	Put at their disposal personal protective equipment (helmet and eye filter mask, appropriate uniform, heat-resistant gloves with cuff, high, closed and insulating safety shoes, hearing protective solutions)
		Informing and training welders about the risks involved
		Use working equipments and a collective protection system
		Carry assessment of risks and take appropriate measures

Risk related to working at height	C.11	Informing and training welders about the risks involved on works at height
		Carry assessment of risks and take appropriate and corresponding measures
		Put at the disposal of workers appropriate personal protective equipment
Risk related to storage of hazardous products	C.12	Carry assessment of risks and take appropriate and corresponding measures
		Respect the storage conditions for hazardous products taking into account of chemical products
Generation of Waste	C.13	Recycle and value waste
		Reducing waste at the source
		Setting up a waste storage area
		equip the site with bins according to the nature of the waste

Table 15 : **Measures in the operating phase**

Impacts		Mitigation or improvement measures
Degradation of air quality and gaseous emissions	E.1	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	E.2	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 accidents due to increased traffic	E.3	Raise awareness of good driving behaviour among staff.
		Train and recruit qualified drivers
Risk of personal injury and material accident	E.4	Recruit a permanent HSSE team (Hygiene, health, safety, Environment)
		Setting up and managing HSSE système
		Training staff in accident risks
		Have an infirmary for first aid and occupational medical doctor
Risk of explosion	E.5	Permanent maintenance of vehicles and other equipment
		Recruit a HSE manager
		Respect storage conditions and manipulation of hazard products
		Conduct a hazard assessment
		Respect conditions of realisation of welding activities
		Respect storage conditions of hazardous products by taking into account chemical products
Risk of fire	E.6	Build sand traps or water tanks
		Train staff in fire safety measures
		Equip the site with fire extinguishers and RIA
		Install means of automatic detection and fire fighting
Noise pollution	E.7	Permanent maintenance of equipment
		Delineate noise zones (noise mapping)

		Equip workers with anti-noise helmets and earplugs
olfactory Nuisance	E.8	Equipping employess with mufflers
		Install a ventilation system to provide fresh air to silos
		Ensure proper treatment of wheat seeds to prevent putrefaction
Risk of equipment malfunction	E.9	maintain equipments
		Checking lifting, gas and steam equipment
Water Pollution	E.10	Training staff to accidental spill of pollutants
		Equip machinery maintenance areas with hydrocarbon dispersant
		Carry a physicochemical analysis of water each semester (06 months
Road Accident (increase of road traffic)	E.11	Train drivers in defensive driving and recruit qualified drivers
		Inform and train drivers to respect road safety rules
Conflict between employees and other stakeholder	E.12	put a corporate communication department on permanent standby to listen to employees and other stakeholders.
		Set up a complaint management service
Risk related to wheat storage	E.13	Conduct a hazard assessment
		Recruit a HSE manager
		Respect storage conditions of cereals
		Use insecticide and appropriate chemical products while respecting standard of use to treat wheat

Tableau 16 : Measures in the closure and decommissioning phase

Impacts		Mitigation or improvement measures
Risk of environmental pollution	F.1	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
		Put in place measures to prevent spills or clean up affected areas
Loss of jobs	F.2	Discuss with MINTSS and the trade unions the conditions of liquidation of employees' rights
		Pay employee entitlements
Generation of hazardous waste	F.3	Arrange waste storage areas by nature
		Have the waste from the dismantling of the installations treated by authorised companies.

Chapter.6 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 10^3 FCFA ;
- Timeframe for implementation ;
- Objectively verifiable indicators.

Table 17 : Environmental and Social Management Plan for the development and construction phase

Potential impacts	Mitigation measures	Specific objectives	Responsible for implementation	Person in charge of 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	Aviod Air pollution	Works company	CDS PGES Consulting engineer	AFISA.S.A	Adhoc	2024-2025	Ticket and report of technical inspections done
Degradation of the soil quality	Train thle personnel in accidental spill of hydrocarbons	avoid soil pollution	Works company	CDS PGES	AFISA.S.A	Adhoc	2024-2025	Number of people trained Rapport HSE
Degradation of the water quality	avoid making deposits at less than 100 m from streams	Avoid water pollution	Works company	CDS PGES Consulting engineer	AFISA.S.A	/	2024-2025	Constat visuel HSE Report on waste maagement
Risks of personal injury and material accidents on site	Put vertical and horizontal signs on site	Security of the site	Works company	CDS PGES Consulting engineer	AFISA.S.A	Adhoc	2024-2025	Presence of signs
	Recruit a permanent HSSE manager on site	Insure the security of employees	Works company	CDS PGES	AFISA.S.A	5 00	2024-2025	Worksite organization chart
	Equip the personel with PPE and ensure they are used	Protect the staff in case of accident	Works company	CDS PGES	AFISA.S.A	5 000	2024-2025	PPE Purchase voucher, visual inspection of equipment worn by the personel
Risk related to working at height and welding	Former le personnel aux risques de danger	avoid work related d'accidents	Works company	CDS PGES	AFISA.S.A	Adhoc	2024-2025	Number of work related accident recorded
Generation of waste	Arrange waste storage areas by nature	avoid pollution	Works company	CDS PGES	AFISA.S.A	2 000	2024-2025	visuel observation of trash can and purchase voucher
	Have hazardous waste removed by authorised companies	Ensure cleanliness on the site	Works company	CDS PGES	AFISA.S.A	/	2024-2025	Traceability Manifesto of hazardous waste management
Job Creation	Equal skills recruit locals	avoid frustrations	Works company	CDS PGES	AFISA.S.A	/	2024-2025	Employment Contract numbers of locals recruited
	Respect salary grid and payement conditions	Avoid frustrations	Works company	MINTSS	AFISA.S.A	/	2024-2025	visuel observation and pay sheet
Total estimate of ESMP during development and construction phase						**7 500 000**		**2024-2025**

Table 18 : Environmental and Social Management Plan for the operating phase

Potential Impacts	Mitigation measures	Specific objectives	Person in charge of implentation	Person in charge of monitoring	Funding	Amount (10^3 FCFA)	Time frame	Objectively verifiable indicators
OPERATING PHASE								
Risk of personal injury and material accident	Recruit a permanent HSSE team	Consideration of QHSSE	AFISA.S.A	CDS PGES	AFISA.S.A	400	2025-2050	Company chart
	Set up a management QHSSE system	management of QHSSE	AFISA.S.A	CDS PGES	AFISA.S.A	/	2025-2050	QHSSE Report
	Recruit a doctor and occupational nurse	Watching staff health	AFISA.S.A	CDS PGES MINSANTE	AFISA.S.A	Ad hoc	2025-2050	Health Report
Risque of road accident	Inform and train drivers to defensive and to respect road safety rules	Reducing risk of road accident	AFISA.S.A	CDS PGES	AFISA.S.A	Ad hoc	2025-2050	Number of road accident recorded
Degradation of the quality of air and gaseous emissions	Analyse every 6 month gaseous of equipments (Generators, …) and collect date	Reduce gaseous emissions	AFISA.S.A	CDS PGES	AFISA.S.A	2 600	2025-2050	QHSSE Report
	upkeep equipments and management of induced effects	Reduce risks of air pollution	AFISA.S.A	CDS PGES	AFISA.S.A	/	2025-2050	method service Report
Waste generation and olfactory/visual nuisance	Put dustbin and remove hazardous waste by an approved company with traceability	avoid pollution of natural environment	AFISA.S.A	CDS PGES	AFISA.S.A	2 500	2025-2050	Manifesto ; environmental Permit
	Setting up a special waste storage area	Limit the impact zone	AFISA.S.A	CDS PGES	AFISA.S.A	/	2025-2050	visual inspection and HSE report on waste management
	Clear the site of biodegradables waste by landfill	avoid pollution	AFISA.S.A	CDS PGES	AFISA.S.A	/	2025-2050	report on waste management
Job Creation	Recruting local for equal skills	avoid frustrations	AFISA.S.A	CDS PGES	AFISA.S.A	Ad hoc	2025-2050	recruitment Report
Risk of fire and explosion	Train staff on fire safety measures	Reduce fire risks	AFISA.S.A	CDS PGES	AFISA.S.A	5 000	2025-2050	Training Report
	Equip the site with fire extinguishers	Ensuring protection	AFISA.S.A	CDS PGES	AFISA.S.A	Ad hoc	2025-2050	Presence of fire extinguishers
Risk related to storage of wheat	Carry a hazard study	Reduce hazards	AFISA.S.A	CDS PGES	AFISA.S.A	Ad hoc	2025-2050	Emergency plan form hazard study report
Noise pollution	permanent maintenance of equipment	Reduce noise	AFISA.S.A	CDS PGES	AFISA.S.A	Ad hoc	2025-2050	HSE Report
	Delineate noise zones (noise mapping)	Reduce noise	AFISA.S.A	CDS PGES	AFISA.S.A	Ad hoc	2025-2050	noise mapping report
	Equip workers with anti-noise helmets and earplugs	protection of staff	AFISA.S.A	CDS PGES	AFISA.S.A	12 500	2025-2050	Number of staff equip with PPE

Potential Impacts	Mitigation measures	Specific objectives	Person in charge of implentation	Person in charge of monitoring	Funding	Amount (10^3 FCFA)	Time frame	Objectively verifiable indicators
Health and safety risks in the worplace	Organise screening sessions of STI/AIDS	Limit infections	AFISA.S.A	DD District health center	AFISA.S.A	12 000	2025-2050	medical visit Report
	Prendre en charge des employés séropositifs	Reduce mortality	AFISA.S.A	DD District health center	AFISA.S.A	/	2025-2050	medical visit Report
	Put at the disposal of workers clean water and soap	Limiting the spreas of COVID 19	AFISA.S.A	DD District health center	AFISA.S.A	500	2025-2050	medical visit Report
	Sensitise workers on barriers measures	Limiting the spreas of COVID 19	AFISA.S.A	DD District health center	AFISA.S.A	Adhoc	2025-2050	medical visit Report
Conflict between employees and other stakeholder	Set up a complaint management service	Ensure a good management of conflicts	AFISA.S.A	CDS PGES	AFISA.S.A	/	2025-2050	Complaint report
Risk of equipment malfunction	Carrying out maintenance of equipment	Good management of facilities	AFISA.S.A	CDS PGES	AFISA.S.A	Adhoc	2025-2050	Chart
	maintenain the equipment	Planning maintenance	AFISA.S.A	CDS PGES	AFISA.S.A	/	2025-2050	Data Report
	control of lifting equipment	Ensuring equipment quality	MINMIDT	CDS PGES	AFISA.S.A	1 000	2025-2050	Testing Certificate
Risk of failure	Conduct a hazard assessment	Insure security of staff	MINMITD	CDS PGES	AFISA.S.A	Adhoc	2025-2050	Certificate of compliance
	carry maintenance of silos		MINMITD	CDS PGES	AFISA.S.A	Adhoc	2025-2050	MINMITD Report
Total estimate SEMP for the operating phase			**15 000 000 FCFA**					**2025-2050**

Table 19 : Environmental and Social Management Plan for the closure phase

Potential Impacts	Mitigation measures	Specific objectives	Person in charge of implentation	Person in charge of monitoring	Funding	Amount (10^3 FCFA)	Time frame	Objectively verifiable indicators
CLOSURE AND DISMANTLING PHASE								
Risk of environmental pollution	Conducting an environmental audit of the closure of the unit	Reducing impacts	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	Closure audit report
	Inspecting the facilities	Environmental review	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	Inspection report
	Restore the site	Environmental remediation	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	Works Report
	Have waste and hazardous substances removed for treatment by authorised facilities	Avoid pollution	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	HSSE Report
	Drain, clean and flush liquid effluent circuits and tanks	Avoid pollution	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	HSSE Report
Loss of jobs	Discuss with MINTSS and the unions the conditions for the liquidation of employees' rights	Administrative procedures	AFISA.S.A	MINTSS	AFISA.S.A	For the record	Year of closure	Tripartite Agreement
	Pay employees' rights	Avoid frustrations	AFISA.S.A	MINTSS	AFISA.S.A	For the record	Year of closure	Tripartite Agreement
Hazard waste generation	Arrange the waste storage areas by type	Avoid pollution	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	HSSE Report
	Have waste and hazardous substances removed for treatment by authorised facilities	Avoid pollution of natural environment	AFISA.S.A	CDS PGES	AFISA.S.A	For the record	Year of closure	Destruction report agreement
Total estimate of ESMP during dismantling phase			For the record					Year of closure

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 managé ;

- 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 20 : Environmental and social monitoring plan

Activities	Affected component	**Impact**	Timeline monitoring and followup	**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
	Soil, air,	Risk of air pollution, soil erosion	3 years	MINEPDED MINTP COUNCIL	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 works	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 ET RECOMMENDATIONS

The project to build and operate the AFISA S.A. storage tanks 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).**

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 Bali locality;

R2 : Create a platform between the company and the community through the chief of the canton Bell ;

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

R4 : Carry out a hazard study during operation

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ANNEXES

- Liste des experts
- Lettre d'approbation des termes de références ;
- Termes de références ;
- Procès-verbal de la consultation publique ;
- Recueil d'avis des sectoriels
- Plan de masse

ANNEXE 1 : LISTE DES EXPERTS

N°	Nom	Qualification	Poste
1	TANGA DJEUTA Marcel	Ingénieur Agro-Génie Rural	Chef de mission
2	ENANGUE BOSSAMBO M. Flore Epse BELL	Ingénieur Génie Civil Msc en Environnement	Adjoint chef de mission
3	MATENE Clarice	Master en Gestion des ressources naturelles	Environnementaliste
4	EYOUM PRISO Alpha Doris	Licence en droit privé	Juriste
5	KABEYENE Patrick	Maîtrise en Droit public	Expert Sociologue

ANNEXE 2 : LETTRE D'APPROBATION DES TERMES DE REFERENCE

REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie

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

CABINET DU MINISTRE

TR/---0169

N°_____/L/MINEPDED/CAB/CST

V/Réf : 221/Transmission/08-23 du 28 août 2023

REPUBLIC OF CAMEROON
Peace - Work – Fatherland

MINISTRY OF ENVIRONMENT, PROTECTION OF NATURE AND SUSTAINABLE DEVELOPMENT

MINISTER'S CABINET

Yaoundé, le 17 OCT 2023

LE MINISTRE

A

Monsieur le Directeur Général
de Afisa Food Industry S.A
B.P : 15303 ; Tel : 655 41 44 12
DOUALA

Objet: Termes de référence de l'étude d'impact environnemental et social sommaire du projet de construction et d'exploitation des silos de stockage de 80000 tonnes de blé dans la zone portuaire de Douala.

Monsieur le Directeur Général,

J'ai l'honneur d'accuser réception de votre correspondance, me transmettant les termes de référence de l'étude d'impact environnemental et social sommaire du projet de construction et d'exploitation des silos de stockage de 80000 tonnes de blé à 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 les dates du 10 au 13 octobre 2023 prévues pour les consultations des parties prenantes devront être revues afin de respecter les dispositions réglementaires, notamment le délai d'information prévu à l'article 21 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, vos termes de référence reçoivent mon approbation. Les termes de référence ainsi approuvés tiennent lieu de prescriptions du cahier de charges stipulées dans 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 sa version électronique sur CD-Rom en fichier PDF.

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

Le Ministre Delegue
Dr Nana Aboubakar Djalloh

ANNEXE 3 : TERMES DE REFERENCE

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

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DES SILOS DE STOCKAGE DE 80 000 TONNES DE BLE A LA ZONE PORTUAIRE DE DOUALA, ARRONDISSEMENT DE DOUALA 1ER, DEPARTEMENT DU WOURI, REGION DU LITTORAL CAMEROUN

TERMES DE REFERENCE

Août 2023

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I. INTRODUCTION

Dans le cadre de son implantation au Cameroun, AFISA a un site à la zone portuaire de Douala, pour la construction de 16 silos de 5000 tonnes chacun dans lesquels seront stockés des céréales au port autonome de Douala. Le présent document constitue les termes de référence (TDR) de l'Etude d'Impact Environnemental et Social (EIES) du projet d'AFISA, situé dans arrondissement de Douala 1er, 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 de 16 silos pour le stockage du blé. 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 unité. 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-c) classe le projet de construction des réservoirs 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 S.A.
- N° du RCCM : RC/DLA/2018/M/4572
- N° de contribuable : M01152248434E
- Directeur Général : Monsieur DJOFANG Cyrille

I.4. Nature du projet

Le projet qui fait l'objet de la présente étude est celui de la construction et de l'exploitation des réservoirs pour le stockage des blés à la zone portuaire, arrondissement de Douala 1er, Département du Wouri. Il s'agit plus précisément de construire 16 silos de 5 000 tonnes chacun soit 80 000 tonnes pour l'ensemble.

I.5 Procédures d'attribution de l'étude

L'étude d'impact environnemental et social du projet de construction et d'exploitation des silos, 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.

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.

- Loi N°77/11 du 11 juillet 1977 portant réparation et prévention des accidents de travail et maladies professionnelles ;
- Loi N° 77/11 du 13 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.
- 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 ;

Les textes d'application des différentes lois :

- 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°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.
- 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/MINEP du 13 février 2007 définissant le contenu général des termes de référence d'une étude d'impact environnemental ;
- Arrêté nº 001/MINEPDED/ du 15 octobre 2012 fixant les conditions d'obtention d'un permis environnemental en matière de gestion des déchets ;
- Arrêté nº 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.
- 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.

Dans le présent décret, l'État transfert 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°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.
- Décret N° 2011/2583/PM du 23 août 2011 Portant réglementation des nuisances sonores et olfactives.
- Décret N°2011/2583/PM DU 23 aout 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.

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 1er)
- 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 13: Localisation du site du projet d'AFISA à la zone portuaire

Le site de construction des silos de stockage, se trouve en bordure du Wouri, dans la zone portuaire de Douala entre la base du Douala International Terminal (DIT) et les bureaux de la Douane. Le site se trouve entre 4.047197° et 4.0478059° latitude Nord, 9.685353° et 9.686905° longitude Est. L'altitude est de 3 m.

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 est à noter que le site du projet se retrouve dans la zone portuaire de Douala. Cette zone a été entièrement colonisé par l'homme.
- **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 du projet au niveau de la composante socioéconomique.

II.5. Contexte socio-économique

Le projet de AFISA va s'implanter dans la zone portuaire 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.

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 des réservoirs (16 silos) pour le stockage du blé dans le port autonome, dans l'arrondissement de Douala 1er. 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

Les unités de stockage de céréales sont devenues à l'heure actuelle plus que nécessaires. Ceci est dû essentiellement à la production de volumes importants qui nécessitent de les adapter au besoin des marchés et de ce fait de les stocker. C'est dans ce contexte qu'AFISA prévoit de construire et d'exploiter 16 silos d'une capacité de 80000 tonnes pour stocker le blé. Le blé stocker est importé des pays tels que l'Allemagne, la France, Le Canada, l'Ukraine et la Russie. Ce projet va engendrer les emplois directs et favoriser des partenariats avec d'autres entrepreneurs, notamment pour la fourniture des matériaux et équipements, qui sont utilisés pour la construction des silos. 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 construit :

- Les silos (16) en forme cylindrique en béton armé et en métal. Ces silos comportent généralement des cellules juxtaposées de sections variables et de grande hauteur. Ils sont terminés à leur base par les mamelles de vidange, mais fermés à leur partie supérieure par un plancher sur lequel sont installés les appareils de remplissage.

L'installation des silos comporte comme étapes :

- ✓ Une fosse F de réception dans laquelle sont versés les céréales à leur arrivée ;
- ✓ Un élévateur E soulevant les grains de la fosse vers l'étage situé au-dessus des cellules ;
- ✓ Une bande transporteuse T supérieure acheminant les grains depuis leur déversement de l'élévateur jusqu'à l'orifice de remplissage des cellules ;
- ✓ Les cellules proprement dites ;
- ✓ Une bande transporteuse t inférieure reprenant les grains lors de la vidange des cellules.

Le schéma élémentaire d'un silo présenté sur la figure ci-dessous

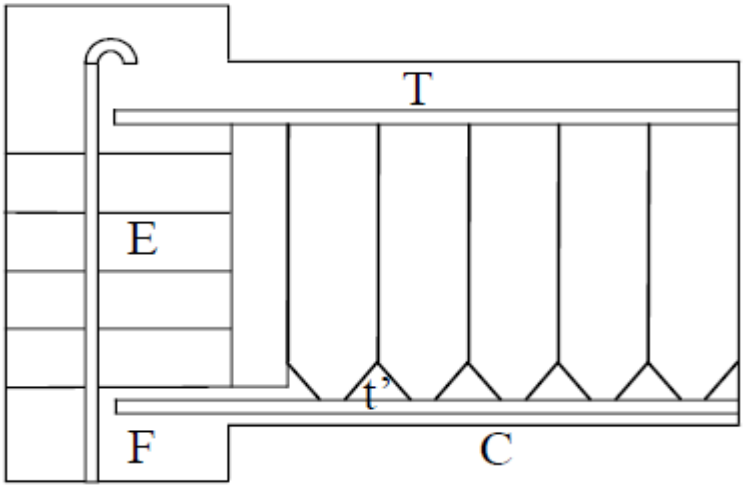


Figure 14: Schéma élémentaire des silos

Figure 15 : Une vue des Silos métalliques à construire

AFISA prévoit également de construire sur le site :

- Un magasin pour stocker les équipements et matériels de construction ;
- Un atelier de travail ;
- Un vestiaire ;
- Un réservoir d'eau ;
- Une salle de pompage d'eau potable ;
- Une salle de commande électrique.

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

Les études du sol seront faites par un BET agréé pour les sondages afin de déterminer les profondeurs des fondations.
Les études de faisabilité technique du projet APS et APD sont en phase d'achèvement
Les études environnementales sont en cours, comme le montre les présent TDR.
Les études de dangers pourront suivre au cas où la nomenclature des établissements classés le demande.

TRAVAUX D'AMÉNAGEMENT

Les travaux d'aménagement s'articuleront autour du :

- Nettoyage du site ;
- Terrassement (déblai et remblai) ;
- Régalage et compactage du terrain ;
- Mise en place des pieux de fondation.

Ces travaux seront réalisés à la fois par une entreprise de BTP qui ferons les travaux de terrassement et de nettoyage du site selon les règles de l'art.
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 des silos.

III.2.2. Phase de construction des unités

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

- Construction des silos en étapes

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

- 8 silos de 5 tonnes chacune en phase 1 (Voir couleur Bleu sur le schéma)
- 4 silos de 5 tonnes chacun en phase 2 (Voir couleur verte sur le schéma)
- 4 silos de 5 tonnes chacun en phase 3 (Voir couleur noire sur le schéma)

Les silos seront construits dans la stricte conformité du plan d'implantation de l'architecte.
Ce sont des réservoirs d'ensilage sous forme cylindrique

- Implantation des ouvrages

- Mise en place des pieux et coulage des culées en béton
- Construction des bases des silos en bétons
- Montage des parties métalliques
- Test de fonctionnalités

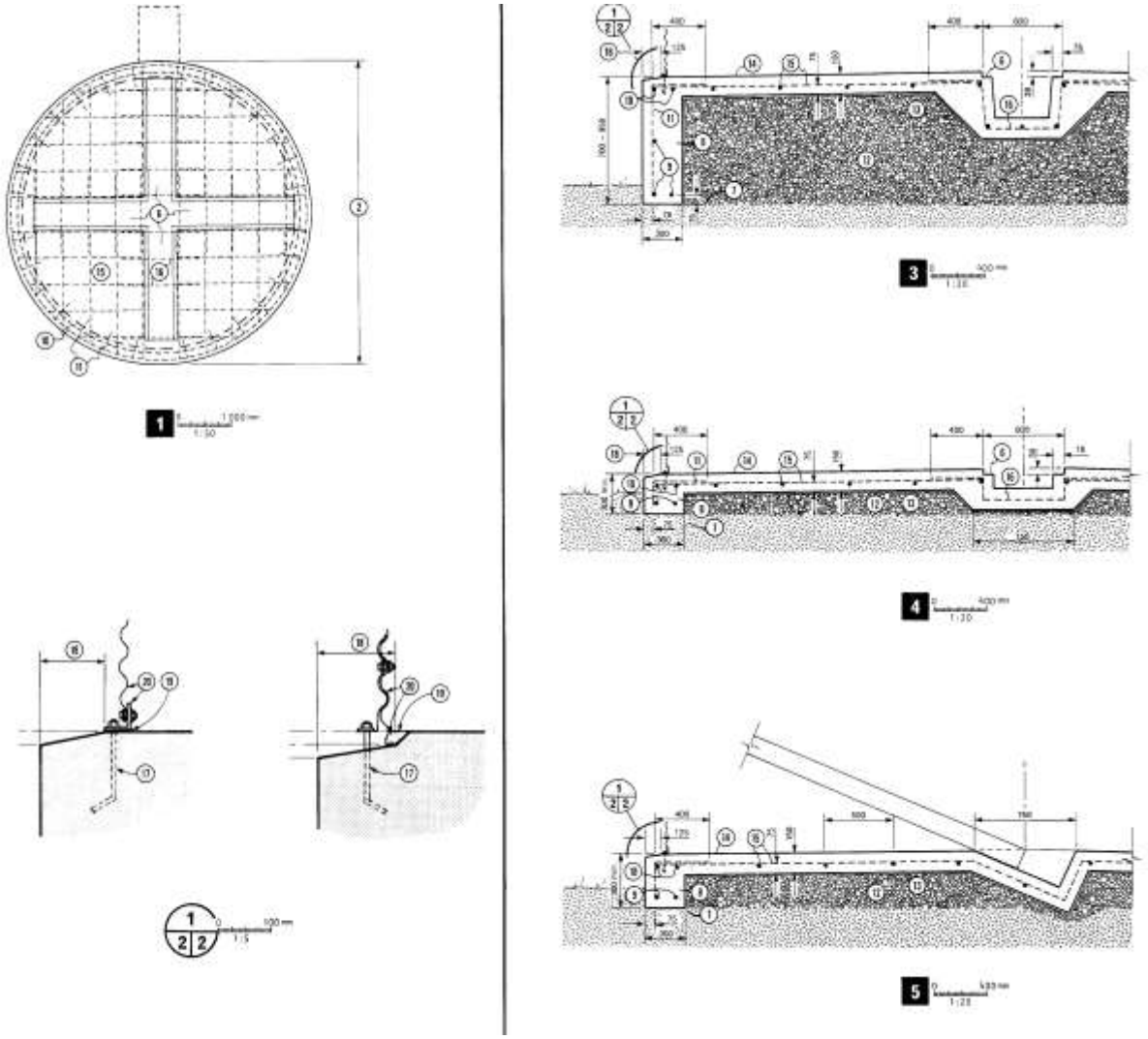


Figure 16: Plan de fondation des silos

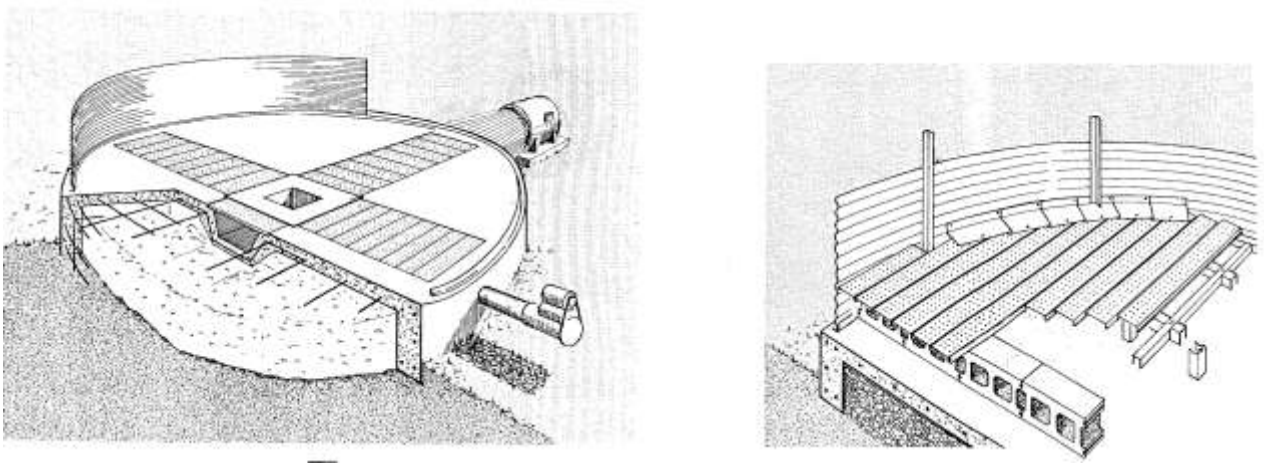


Figure 17: Base des silos

Toutes les dispositions précisées au mémo descriptif et sur les plans devront être respectées.

- Construction des rails de convoyage
  - **Montage des parties métalliques**
- Balisage et marquage des voies de circulations

III.2.3. Installation et montage des 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, le promoteur vise à utiliser comme équipements :

- 16 silos (80000 tonnes) en tôles d'acier galvanisés et béton armé ;
- Des installations électriques (postes de transformations, câbles, armoires électriques etc.)
- Des installations hydriques (un réservoir d'eau et une pompe hydraulique)
- 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.

Tableau 21: 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	

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. EXPLOITATION DES SILOS

Cette étape comprend le déchargement du blé réceptionné au port dans le bateau par grue et par aspiration.

III.3.1. Réception de la matière première

La réception de la matière première se fait par voie maritime à l'aide d'un bateau en vrac. Le blé collecté par une pelle mécanique installé et est ensuite dirigé vers l'une des trémies de réception. Cette dernière est protégée par une grille métallique pour éliminer les grands

déchets. Avec des élévateurs (transporteurs mécaniques), le blé se transporte vers les silos de stockage de capacité 80000 tonnes.

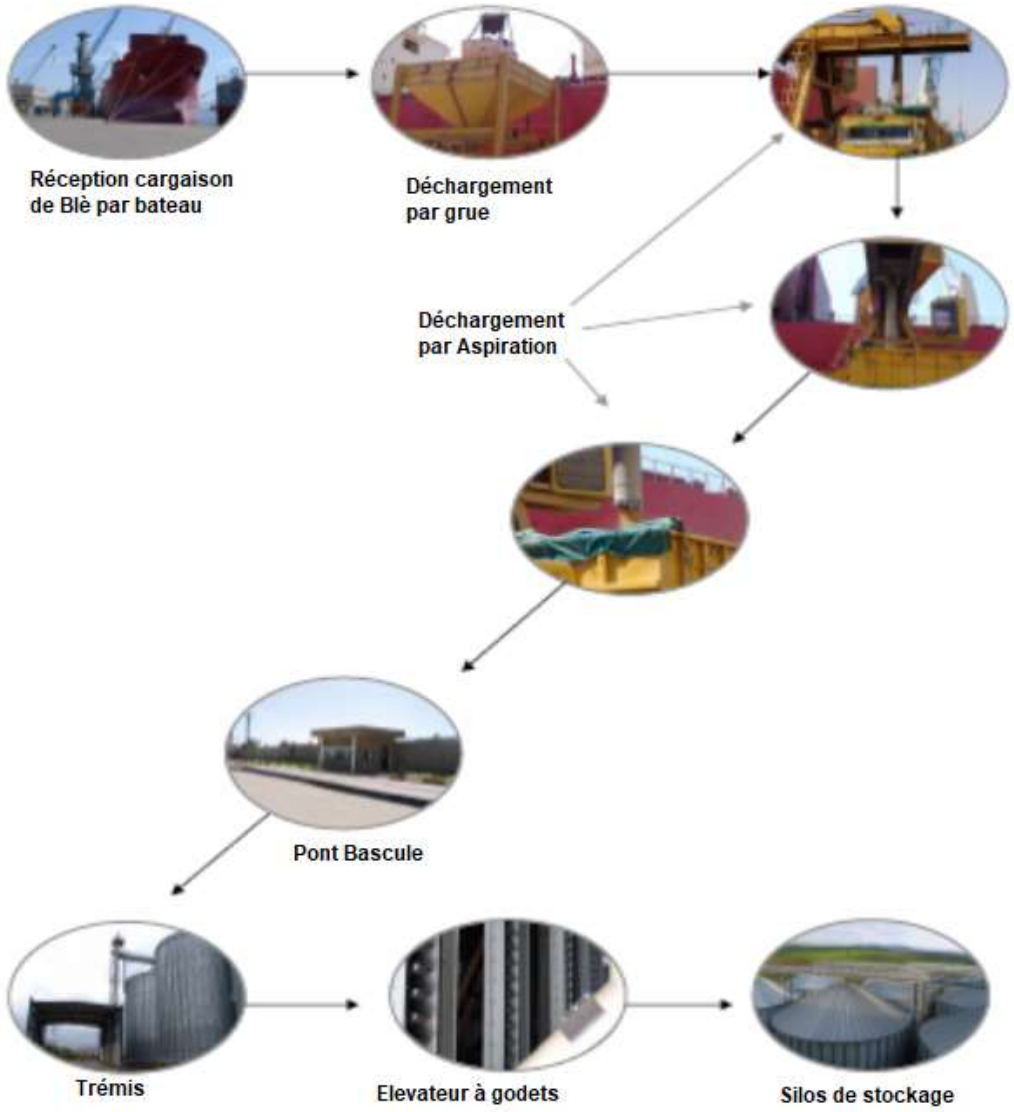


Figure 18: Etapes de réception de céréales

III.3.2. Exploitation d'un silo

Les modes de fonctionnement des silos sont aussi variables que les types de matière ensilée. A titre d'exemple, on présente ici de manière très succincte le fonctionnement d'un silo à céréales. On note la présence de la tour de manutention, qui est une structure séparée des cellules de stockage. A la réception, le grain est versé du camion dans une fosse de réception. Un convoyeur en sous-sol amène le grain vers l'élévateur dans la tour de manutention. En haut, un autre convoyeur effectue la répartition dans les cellules de

stockage. Dans des cas où il n'y a pas d'exigence particulière, le grain est juste versé dans la cellule ; d'autres dispositifs plus sophistiqués sont nécessaires si le grain doit rester intact et non endommagé pour son utilisation ultérieure. Pour la reprise et l'expédition, le grain fait le chemin inverse : via un convoyeur dans la galerie centrale au sous-sol, le grain est transporté dans la tour de manutention, élevé, versé dans le boisseau de chargement, et distribué sur camion. Selon le cas, des étapes supplémentaires sont effectués à l'arrivé ou au départ dans la tour de manutention : nettoyage, séchage, calibrage, …

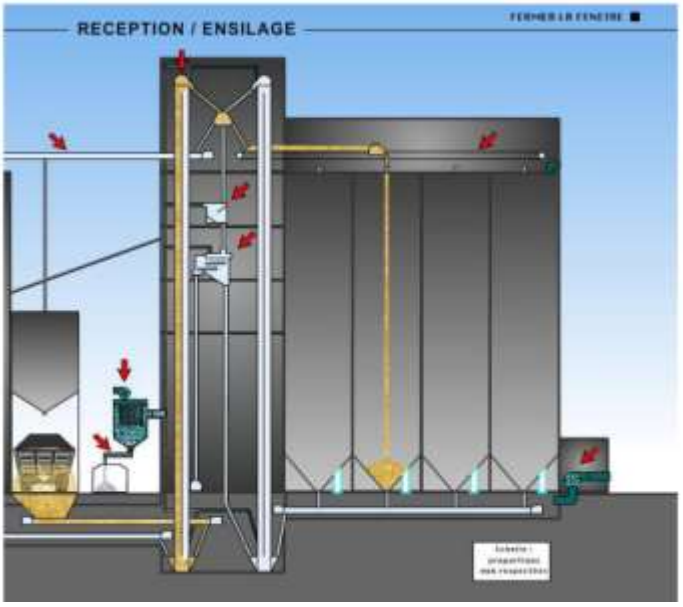


Figure 19: Illustration du fonctionnement d'un silo

III.3. 3. Exigences techniques

En fonction de la matière ensilée et sa destination, les exigences techniques peuvent être très différentes. A prendre en considération, selon le cas :

- L'hygiène pour des produits à consommation humaine : protection contre des insectes, des rongeurs…
- L'étanchéité en termes de fuites vers l'extérieur pour des produits dangereux, y compris en cas d'incendie, séisme, …
- L'étanchéité contre la pluie, voire l'humidité de l'air, pour des produits sensibles à l'humidité
- La sensibilité de la matière ensilée à la température
- Le comportement de la matière ensilée pendant le stockage : germination du grain (formation de bloc solidaire…), fermentation (développement de températures importantes…), autres phénomènes de dégradation de la matière ensilée

- Le comportement de la matière ensilée pour la manutention (remplissage/ vidange) : comportement d'écoulement, tendance de formation de voûtes, bouchonnage…
- Maitrise du risque d'explosion de poussière
- Développement de CO2

L'exigence fondamentale qui est la résistance de la structure aux actions de la matière ensilée, fera l'objet d'autres fiches de la présente série.

III.4. 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.

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 approprié dans la conduite de l'étude.

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

L'étude décrira de façon général, 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 du canton Bell 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.

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.

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.

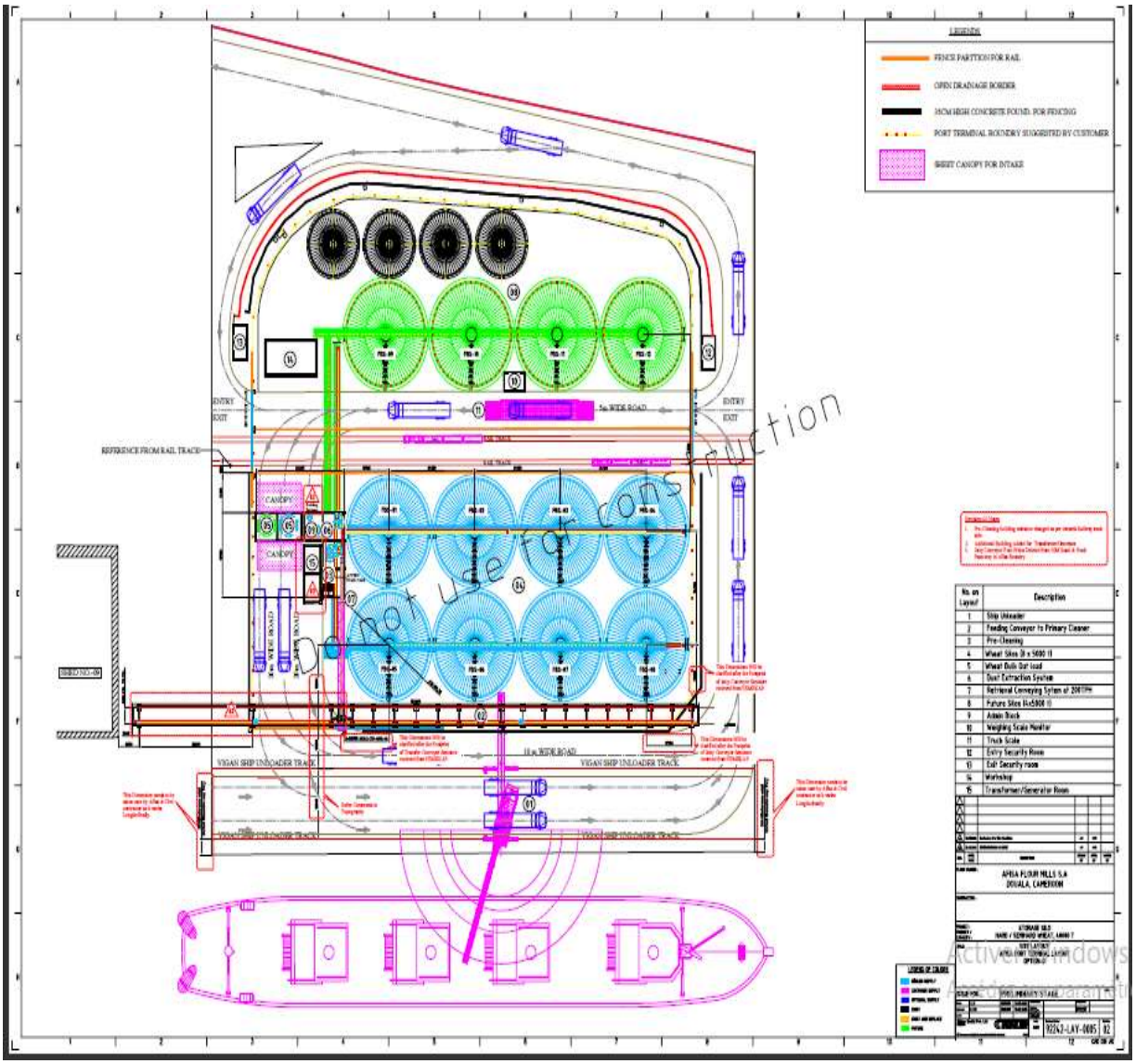
VII PROGRAMME DES CONSULTATIONS PUBLIQUES

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 22: Calendrier Prévisionnel des consultations publiques

Date	**Horaire**	**Objet**	**Acteurs ciblés**	**Lieu**
10 au 13 Octobre 2023	9h - 11 h	Rencontre avec les autorités administratives	- Les Délégués départementaux du MINEPDED, MINMITD, MINEE, MINTSS et MINCOMMERCE du Wouri. - Responsable QHSE du PAD, et des entreprises voisines	Bureaux respectifs
	13h- 16h	Rencontre avec les populations	Riverains et les populations Du canton BELL	Chefferie canton Bell



ANNEXE : Plan de construction des Silos

Annexe 4 : Procès-verbal de la consultation publique

PROCES VERBAL DE LA REUNION DE CONSULTATION PUBLIQUE DU 21 NOVEMBRE 2023 AVEC LES POPULATIONS RIVERAINES

L'an deux mille-vingt-trois et le vingt-unième jour du mois de Novembre, s'est tenue la réunion de consultation relative à l'étude d'impact environnemental et social du projet de construction et d'exploitation des silos de stockage des graines de blé de la société AFISA 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

- Notables,
- Populations locales,
- Promoteur,
- BET
- PAD

Ordre du jour

- Mot de bienvenu;
- Hymne national
- Mot du promoteur
- Présentation du cadre juridique en EIES;
- 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 15h25' par le mot d'ouverture par le représentant du roi Bell en la personne de M MISSIPO Eric. Dans son propos liminaire, il a souhaité la bienvenue à tous et un bon déroulement des travaux. Il a proposé l'ordre du jour élaboré à cet effet qui a été adopté en l'état.

A sa suite, la société AFISA par la bouche de son représentant M KOUMBIZICK a pris la parole pour remercier les participants de leur présence.

Parole a été donné au BET pour la présentation du cadre réglementaire de l'EIES ainsi qu'il suit. La constitution du Cameroun dans son préambule donne le droit à chaque citoyen d'avoir un environnement sain. Ajouté à cela, des textes de lois élaborés depuis 2005 sur la protection de l'environnement et régissant les opérations soumises à une évaluation environnementale. La loi recommande la présentation du projet, ses impacts aux populations riveraines du projet et leur participation aux travaux à travers une consultation publique.

Après avoir brossé le cadre juridique, le projet a été présenté. Au demeurant, la société AFISA est une minoterie ayant une unité de transformation au port autonome de Douala, l'activité objet de notre rencontre est la construction des silos de stockage d'une capacité de 5000 T de blé chacun en série de 4/4 en 4 phases de 4 silos chacun pour un total de 80000 Tonnes. Le projet est dans l'enceinte portuaire à côté de la société DIT. Les travaux consistent dans un premier temps à la construction des silos. Ceci nécessite la pose des pieux au préalable avant que les travaux de chaudronnerie ne prennent le relais. Le blé arrive en vrac par bateau, il est dirigé vers les silos par un convoyeur où un système de nettoyage est mis en place pour enlever les impuretés avant d'être transporté vers l'usine situé à environ 1km du site.

Une présentation des potentiels impacts a été faite par M TANGA. Ils se déclinent en 2 phases lors de la construction et de l'exploitation :

En phase Construction, nous aurons :

- Disponibilité de la farine du blé pour la consommation
- Disponibilité du son de blé pour le petit élevage (volaille)
- Risque d'accidents pendant les travaux (accidents de chantiers) mesures à prendre pour éviter les accidents
- Emploi de la main d'œuvre (sous-traitance, manutentionnaires, location d'appareils)

En phase d'exploitation, nous aurons :

- Réduction d'emplois au regard du système automatique qui sera utilisé
- Émission des poussières ;
- Augmentation charge des déchets (blé, boues de ferraille etc..)
- Pollution atmosphérique par les engins et véhicules qui assureront l'approvisionnement

Après cet exposé, parole a été donné à M MISSIPO pour conduire les échanges. Il a appelé les participants à poser les questions pour plus d'éclairage. Voici la teneur des préoccupations des participants à la consultation :

M. **NGOMBE DICK :** pourquoi AFISA ne demande-t-il pas des espaces cultivables et des engins afin de booster la production locale au lieu d'importer le blé?

M NJOH MANDENUE : quel avantage les populations du canton Bell tirent-elles de ce projet? Parlant d'impact identifié, quelles sont les mesures préconisées pour la gestion des risques sur la population locale?

LOBE BELL : comment seront gérer les émissions des poussières lors du transport du blé des trémies vers les silos? Quel est le sort qui sera réservé productions locales (N'Gaoundéré et autres zones)

Pour cette première vague de questions, les réponses ci-dessous ont été données :

- La quantité de blé utilisée par AFISA ne peut être produite localement. Cette préoccupation nous emmène à porter une attention particulière sur la production locale des matières premières cependant nous avons besoin d'une politique adéquate pour favoriser et booster la production locale.
- L'emploi est ouvert au sein de la société, à compétence égale priorité aux riverains; la plateforme de collaboration est la chefferie qui orientera selon les profils. Pour le moment, 8 silos sont en construction et la durée du projet est de 15 mois.
- Au sein de la société AFISA, l'accent est mis sur les mesures de protection de l'environnement et de l'homme par le port systématique des EPI, les moyens de contrôle pour les travaux en hauteur, l'évaluation de tous les risques et la mise en œuvre des mesures, le reporting des incidents, la mise sur place des barrières de sédimentation, les visites médicales des employés, la pose de signalisation sur le site de travaux …
- Pour le transfert du blé, la hauteur de chute sera réduite, les installations en place exposeront moins le personnel en activité et au sol; il est prévu un système moderne pour réduire et ou contenir les poussières potentiellement nocives.
- La deuxième vague de questions

MISSIPO ERIC : la présence des silos au port de Douala a modifié le visuel sur la façade maritime, y'a-t-il possibilité de construire des parcs en compensation pour les riverains du canton?

ONDOUA NKOULOU : le projet AFISA est-il destiné à l'utilisation locale ou extérieure aussi

NGOMBE DICK : bien vouloir se pencher sur les cas des emplois sans qualification, souhaite l'établissement d'un partenariat entre le canton Bell et la société quant à la gestion des déchets de blé.

Les réponses suivantes ont été apportées :

- La doléance sera portée à qui de droit.
- La problématique du blé est africaine, le blé transformé au Cameroun est destiné à l'usage local prioritairement et à l'exportation aussi.
- Pour ce qui est de l'emploi, la société fera son possible et mettra à la disposition du canton Bell les différentes opportunités d'emploi, Cependant il faut préparer les jeunes à l'emploi qui est quelque peu pénible; avoir un point focal pour la gestion des dossiers.

La dernière phase de questions porte sur :

EKWE Jacqueline : que deviendra la production locale d'ici 5 ans ?

Henri NJOH : est-ce que cette rencontre n'est pas organisée parce que la société AFISA est en train de prendre de l'eau?

Les réponses suivantes ont été données.

- La production locale est encouragée, plus les petits producteurs se mettront ensemble et plus ils produiront plus et deviendront forts.
- AFISA est une société en plein essor et est désireuse d'augmenter sa capacité de production pour ce faire, la priorité est donnée à la construction des silos de stockage avant la mise en service du premier.

Comme mot de fin lié aux interventions, le représentant du délégué a demandé au BET de travailler selon le nouveau canevas du PGES dans l'exploitation et d'être spécifique pour ce qui est des mesures d'atténuation.

Quant à la société AFISA, elle devra œuvrer dans la mise en place d'un système de monitoring continu de l'air ambiant (réduire le phénomène de pollution) selon les recommandations du gouvernement et resté engager dans la mise en œuvre du plan de gestion.

M MISSIPO a fait la synthèse des interventions et a adressé un mot remerciement l'endroit des participants pour leur présence et participation active aux travaux. La réunion a pris fin à 17h15

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

Fait à Douala, le 21 Novembre 2023

AFISA SA

La chefferie

Ngombe Dick Daniel

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DES SILOS DE STOCKAGE DES GRAINES DE LA SOCIETE AFISA A LA ZONE PORTUAIRE DE DOUALA

CONSULTATION PUBLIQUE

Décret N°2013/0171/PM du 14/02/2013 fixant les modalités de réalisation des études d'impact environnementaux et l'arrêté N° 00001/MINEPDED du 08 février 2016 qui fixe les différentes catégories d'opérations dont la réalisation est soumise à une évaluation environnementale

FICHE DE PRESENCE

N°	Noms et Prénoms	Fonction	Quartier	Téléphone	Signature
1	Ngombe Dick Daniel	Notable	Bali	658243852	[signature]
2	Koum Djemba Joseph. S	Notable	Bali	697314526	[signature]
3	EKWE Martin	Notable	Bali	699883878	[signature]
4	DINA Samuel	NOTABLE	Bali	696-65-69-84	[signature]
5	Mißipo Thomas Eric	Notable	Bonanjo	679473692	[signature]
6	ELONG ESSARD [illegible]		Koto	698896185	[signature]
7	TOKO LOPOE FRITS		Bonapriso	656089367	[signature]

N°	Noms et Prénoms	Fonction	Quartier	Téléphone	Signature
8	DANIEL ELEME E.		BALI	699815113	[signature]
9	MOUEN MAGOLLO		BALI	692133745	[signature]
10	Muna Ekamby G. B.		Bali	699802358	[signature]
11	Manga Ekalle Jolie		Bonapriso	680944480	[signature]
12	EKWE Jacqueline		Bali	699887669	[signature]
13	ONDOUA N Koulou			69962 82 49	[signature]
14	Tooh Bee		Bali	6994 [illegible]	[signature]
15	NTENDA BEBE J. Victor		BALI	696.19.01-62	[signature]
16	N JOH Henri		BALI	655 67.91.01	[signature]
17	NJOH MANDENGUE		Bali	699 967299	[signature]
18	EWANE [illegible] LOTIN Denis		Bali	697-01-89-95	[signature]
19	ESSAWE MARTIN		BALI	693 11 85 73	[signature]

N°	Noms et Prénoms	Fonction	Quartier	Téléphone	Signature
20	Bema richard		Akwa-Nord	694-54-07-37	
21	Pemba René		Deido	697-28-4-68	
22	Mony Salomon		Koumassi		
23	HEUYA Jean-Paul		Béparda	690363734	
24	KOUMBOUZIOU Serge			690250846	
25	Robert ACHU	CBDD/Labour MINEPDED	Bonanjo	697636686	
26	TANGA D Marcel	Consultant	Deido	69995 3847	
27	ABATE CHRISSY M	Ingénieur Envi/FAD	Deido	69696700	
28	NGNINTEDEM TCHINDA AZIELLE	Assistante-consultant	Deido	698420181	
29	PRISO DORIS	Consultant	Deido	699504004	

Annexe 5 : Fiche de recueil d'avis

FICHE DE CONSULTATION INDIVIDUELLE

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DES SILOS DE STOCKAGE DES GRAINES DE LA SOCIETE AFISA A LA ZONE PORTUAIRE DE DOUALA

AVIS SUR LE PROJET

Nous portons un avis favorable sur le projet dans l'ensemble ayant une connaissance de la zone du projet

Préoccupations/craintes relatives à la mise en œuvre du projet

Les activités de dépotage du clinker pourraient avoir un impact négatif sur les activités de stockage des grains si ces dernières sont proches l'une de l'autre

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

Nous suggérons l'installation d'un système de lutte incendie sur le site et la mise sur pied d'un système de gestion des avaries en cas de grosse importation aux cas où ces graines venaient à être rejetées.

Nom et signature	Fonction	Téléphone
Robert ACHU	CBDD MINEPDED	(P.O) Achu Robert A. Ubah M.Sc en Gestion des Ressources Naturelles et Environnement

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DES SILOS DE STOCKAGE DES GRAINES DE LA SOCIETE AFISA A LA ZONE PORTUAIRE DE DOUALA.

FICHE DE CONSULTATION INDIVIDUELLE

Question 1 : Avis sur le projet

R 1 : - Après la mise en place de la Minoterie dans la zone portuaire de Douala dans l'Arrondissement de Douala 1er, les silos de stockage des graines de la société AFISA va venir à coup sûr augmenter la capacité de production de farine de blé qui est l'un des produits les plus prisés en termes de besoin alimentaire.

Comme pour la minoterie, l'on ne peut que louer l'initiative prise pour cette extension de ce projet d'envergure.

Toutefois, la tendance à la fluctuation du prix de la farine de blé dans nos marchés créés 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 tension entre les décideurs et AFISA pourrait s'accentuer par rapport au prix à débourser par les ménages. En d'autres termes, il est question de se demander si l'extension d'AFISA par la construction des silos de stockage 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 CONSULTEE

NOM ET PRENOMS	FONCTION/QUALITE	CONTACT ET SIGNATURE
Madame SOSSO épouse MAGNAGUEMABE Aurélie	Délégué Départemental du Commerce	655 080 887

22 NOV 2023
Mme. Sosso Aurélie Epse. Magnaguemabe
PLEG Hors Echelle

FICHE DE CONSULTATION INDIVIDUELLE

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DES SILOS DE STOCKAGE DES GRAINES DE LA SOCIETE AFISA A LA ZONE PORTUAIRE DE DOUALA

AVIS SUR LE PROJET

- Viable - Nécessaire - Très utile pour la Croissance Economique et Sociale des Populations du Centre Sud - du Cameroun et d'Afrique

Préoccupations/craintes relatives à la mise en œuvre du projet

- Sécurité - Emploi - Partenariat Local
- Gestion Sociale et Economique

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

Envisager la création des Routes en Compensation du Paysage Relatif à l'installation des Silos

Nom et signature	Fonction	Téléphone
Mr Nissipo Thomas Eric	Notable Bonanjo Centre - Sud	677917362

FICHE DE CONSULTATION INDIVIDUELLE

ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE CONSTRUCTION ET D'EXPLOITATION DES SILOS DE STOCKAGE DES GRAINES DE LA SOCIETE AFISA A LA ZONE PORTUAIRE DE DOUALA

AVIS SUR LE PROJET

Un projet qui je l'espère contribuera à sa manière à la croissance de l'économie locale en permettant une meilleure sécurité alimentaire.

Préoccupations/craintes relatives à la mise en œuvre du projet

Que le Respect des exigences environnementales pour atténuer les impacts négatifs du projet soit banalisé.

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

Que la Société, au delà de se ravitailler en blé local participe, dans le cadre de ses activités de responsabilités sociétales, à la formation des cultivateurs locaux pour une meilleure production.

Nom et signature	Fonction	Téléphone
ABATE GHISLAIN	Ing. Environnement	69696780

ANNEXE 6 : PLAN DE MASSE