

Environmental impact assessment report

On

Pasta and macaroni project

Promoter:

Alvima PLC.

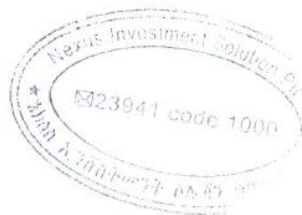
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Executive Summary

This environmental impact assessment study has been conducted to identify significant environmental and social impacts of the proposed Pasta and Macaroni Factory to be located in Adama town, Kebele 09 on the way to Wonji and the site is on the road side of the new Addis-Adarna highway; and to reduce its negative effects on environment and human health.

The market study done for pasta and macaroni indicates that there is ample demand in the Ethiopian Market. Accordingly, the demand for Pasta & Macaroni products are estimated to be 70,871 and 159,267 tons in the years 2013 and 2018, respectively. The projected demand and supply gap is estimated to reach 14,290 and 72,210 tons of in the years 2013 and 2018, respectively. With continuing growth in demand, supply from the domestic plants has capacity limitation to meet the demand, thus the feasibility study confirmed that the unfulfilled demand will continue to increase.

On the basis of the feasibility study, the plant would produce 23,400 tons of pasta and macaroni at full capacity. This is based on a production schedule of 300 production days per year.

The total investment cost of the project is estimated to be Birr 137,677,257 of this, Birr120,796,003 is the costs of fixed investment items while the working capital and pre-operation interest cost covers the remaining. The financial plan indicates that the project's investment cost will be covered from owners' equity and Bank loan. Out of the total planned investment of Birr 137,677,257, Owner's equity is expected to cover birr 43,204,257 and while the rest Birr 94,473,000 will be covered from the bank loan. This report document attempts to show some environmental and social impacts and controlling measures for The Pasta & Macaroni Factory project to be located in Adama. The Company is planned to follow suggested mitigation measures to control all the impact associated with factory operation



• The development of network and the provision of electricity, pure water, etc will have direct impacts on the development of the area. Another major benefit for the local people is the provision of employment opportunity for the surrounding community. Although it will be much lower than that of required for the operation phase of the Project, the construction phase of the project requires relatively high volume of water. Which will have a substantial impact on existing groundwater source? In addition to this, during the construction phase of the project, foreign materials like oil, grease, solid byproducts from the construction process would be thrown away to surrounding areas that can originate.

Mitigation Measures:

The following measures mitigate the impacts:

• Limit water withdrawal to the amount that will not adversely affect the groundwater balance and the demand of the local community, by Developing and conserving own source of water.

Make use of construction materials coming from authorized quarry site,

- Contribute to the rehabilitation of quarry site,
- Carefully excavating, storage and reuse of removed top soils.

Employees' health hazard is high if protective devices are not provided to them. Inhalation of bad air, absorption of floating particulates in the surrounding air, dust and ingestion of pollutants during eating, smoking and drinking are high in improperly installed food processing factories.

Mitigation Measures

- Provide employees with protective devices, hand gloves, nose and mouth mask
- Train employees on safety precautions

Here below few recommendations were forwarded:

• To enhance the potential economic benefits and social acceptability of the project; it is very important for the company management body and proponent (a) to avoid or minimize and advert impact of the project on human health and (b) to reduced impact on environment



It is recommended that the proposed mitigating measures are properly

Implemented on time.

- To ensure proper implementation of mitigation measures, monitoring and auditing must be conducted.
- In addition, the company should create harmonious relationship between the local communities by holding discussions with local people so as to develop strong ties with them.
- In collaboration with the local government and the affected community, the company should support development efforts in the project site. This will strengthen trust between local people and the company.
- The company must develop its own internal environment policy, environmental management system and comply with federal and regional state environmental regulation and international standard



Chapter-1, Introduction

1.1 General

Alvima PLC. Was established as per the commercial code of Republic of Ethiopia. The Primary objective of the company is to manufacture and import products. Alvima has established and clearly defined its vision; that is becoming number one destination for a High-class products'. This will be achieved through becoming multifaceted company committed to providing maximum customer satisfaction.

- The company's vision is to be implemented through local and external partnership.
- The company has the following objectives:
- To generate income (profit) to the shareholders;
- 'To supply quality products for local customers.
- 'Contribute to the socio-economic development of the nation at large and to the Food sectors in particular.

The Pasta & Macaroni Factory is to be located in Adama town, Keble 09 on the way to Wonji and the site is on the road side of the new Addis-Adam highway, about 100km from the capital Addis Ababa to south east. The proposed t is to be located on 10,000^{km2} of lands in area designated for industrial establishments. The proposed site can be reached with first grade asphalt road, from the center of Addis Ababa. The proximity of the project site is an advantage to reach the market. The project site, as it is located in the close proximity of the capital, it enjoys the tremendous services and facilities available.

Electric power supply network to the site neighborhood is in an excellent situation and power shortage will not be a problem. the market study done for pasta and macaroni indicated that there is a simple demand in the Ethiopian market accordingly the demand for pasta and macaroni products are estimated to be 70,871 and 159,267 tone in the years 2013 and 2018, respectively. The project demand and supply gap is estimated to reach 14,290 and 72,210 ton in the



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Food processing industries in general have adverse impacts on environment and human health unless they are established with due care and environmentally friendly manners. Such industries need to undertake environmental impact assessments which provide them with precautionary measures which cover environmental management plans or proposed mitigation measures for identified significant negative environmental impact. By the same token, the proposed Pasta and Macaroni Factory needs to undertake environmental impact assessment to harmonize its proposed project with the national and local environmental laws and international conventions.

This environmental impact assessment (EIA) study was conducted according to legal requirements of the EIA proclamation of the government of the Federal Democratic Republic proclamation No.299/2002.

The purpose of the EIA study is to identify and analyze the magnitude of environmental impacts and to mitigate significant environmental effects which are likely to arise from the various activities and operations of the project, during pre-construction, construction and operation phases of the pasta and macaroni processing project.

Various EIA tools for identification, prediction and analysis of impacts were used properly.

Public consultations were also held and comments of the public consultation are included in the report. Significant analysis on the environmental impact could occur.



Due to the project has been made. Environmental sound, impact mitigation measures and management options were suggested.

The environmental management practices of the company are crucial for the continued access to local and global markets.

The Environmental Impact Assessment (EIA) guidelines (EPA, 1999) prepared by the Environmental Protection Authority (EPA) requires development projects to reduce Adverse effects on the physical, biological and socio-economic environment. The guideline differentiates between development projects with significant and insignificant impacts, which the former projects require full EIA assessment, while the latter need only partial or no EIA at all. As Pasta and Macaroni processing project is among those projects which cause moderately significant impacts on physical, biological and socio-economic environment of mankind, the proposed project is among those investment projects, that require *partial environmental impact assessment study*.

To this effect, Alvima PLC has hired nexus Investment Solution PLC to undertake Environmental Impact Assessment Study for the pasta and macaroni factory project. Moderately significant environmental impacts arise from the pasta and macaroni processing plant project. Pollutants and pollution loads generally originating from the food processing plant are solid wastes, dust, decompositions, occupational health and risks, and environmental impacts occurring during pre-construction, construction and operational phases.

In response to the requirements of the EIA study, Nexus Investment Solution, a consulting firm carried out this Environmental Impact Assessment for the project under consideration. This report represents the findings of the Environmental Impact Assessment (EIA) carried out as an integral part of its assignment.

1.2 Objectives of the Environmental Impact Assessment

The fundamental objective of the environmental assessment is to ensure that the proposed pasta and macaroni processing factory project is environmentally sound and contributes to the sustainable development of the country. It is expected to provide a means whereby the overall environmental performance of this project can be enhanced through:

- Identification of sensitive environmental components likely to be affected by the proposed pasta and macaroni processing and production project,
- Identification and evaluation of the potential impact associated with project implementation and subsequent operation and



- Preparation of plans and recommendations regarding measures that will minimize adverse impacts and enhance beneficial impacts.

1.3 Methodology

1.3.1 General

The methodology used follows the conventional pattern for pasta and macaroni processing factory project where the EIA study meets the requirements of EPA's Environmental Impact Assessment guideline through collection of necessary data and documents, desktop study, impact analysis, choosing mitigation and enhancement measure', using different optimization tools, and developing environmental protection, monitoring and management plans.

1.3.2 Collection of Available Information

The consulting firm collected and reviewed published national policies, legislatives, regulations and guidelines as well as international conventions and protocols ratified by the Fed",31 Democratic Republic of Ethiopia (FDRE), Central Statistical Authority (CSA) Census reports and Documents. The existing Environmental data were also gathered from the feasibility study of the project such as hydrology, topographic map, and socio-economic. Data.

Data collection on site was done using different tools and techniques including the preparation of check lists and matrices appropriate for this project.

1.3.3 Field visit

Site visit was made to assess the baseline environmental conditions of the proposed foods project processing and production, to identify sensitive environmental components that are likely to be significantly affected by the proposed project. During the field Investigation, information on physical and biological resources, socio-economic as well socio-cultural profile data has been collected.

1.3.4 Public Consultation

Public consultation was undertaken for identifying issues during (scoping) and impact study. During the impact study, individuals were informally interviewed, the consultation involved residents living in the area close to the project site. The participant were men, women, and also the youth living in the target community, Following the consultation meeting, an agreement was reached on the issues of the community to be addressed in the project implementation.



1.4 Report STRUCTURE

The main body of the EIA report is structured under 10 chapters: Chapter 1 deals with Introduction. Chapter 2 discusses about the initial environmental examination and scoping report. Chapter 3 reviews the policy, legal and institutional frameworks that are relevant to the project under consideration. This is followed by the description of the project, which is presented under Chapter 4. The description of the existing environment is covered under Chapter 5. This chapter deals with the physical, biological, socio-economic and cultural environment. Chapter 6 is the chapter that deals with the impact assessment and proposing measures for mitigating/enhancing impacts. Under this chapter, the potential positive and negative impacts as well as their enhancement or mitigation measures are covered. Chapter 7 of the report presents the analysis of project alternatives from the environmental impact perspectives. Chapter 8 discusses the study team's proposed Environmental Management Plan for the implementation of the mitigation measures. Chapter 9 is the environmental management program and monitoring plan for the proposed environmental management of the proposed project. In the last chapter; Chapter 10 of the report, the major conclusions and recommendations are highlighted under the conclusion and recommendation section.



Chapter-2. Environmental Scoping

In the aim of deciding upon the limits of the study area for the project and drawing the list of activities and impacts to be studied during the assessment, the consulting firm carried out an initial environmental examination and scoping.

The scoping exercise has been carried out with the following main objectives:

- To define the limits of the study area,
- To define list of Valued Ecosystem Components within the study area,
- To define list of activities, type and magnitude of the proposed project,
- To define list of Impacts to be studied.

In order to carry out the above tasks, the consulting firm employed different tools and techniques relevant to the proposed project. Use of environmental scoping checklists and consultation of different stakeholders (including experts, project affected peoples, local administrators and people, etc.).

2.1 limits of the Study Area

The Environmental Impact Assessment study is conducted for those areas that would be influenced by the impact of the pasta and macaroni plant project implementation. The project site, the land adjacent to the project site and the neighboring environment are the most impacted areas either directly or indirectly by the project implementation. The socio-economic and environmental impacts can, however, be felt beyond those limits.

2.2 Valued Ecosystem Components within the Study Area impact by the Project

The pasta and macaroni processing plant project will totally be located on land delineated for investment in the Adam, Keble 09. The pasta and macaroni processing plant site is bordered by future industrial establishment sites in all directions.

Primarily, soils are the natural ecosystem to be impacted by the project. Secondly, there is landscape form in the project site, which is impacted. Employees are other key elements influenced by the plant establishment and its processing and production of the pasta and macaroni factory.



Chapter-3. Environmental Policy Framework

3.1 The Constitution of the FORE

3.1.1 Sustainable Development and Environmental Rights

The constitution of the 1995 FORE contains a number of articles, which are relevant to the concept of sustainable development and environmental rights. Articles 43 and 44 which state the following:

Article 43: The Right to Development

- The Peoples of Ethiopia as a whole, and each Nation, Nationality and People in Ethiopia in particular have the right to improved living standards and to sustainable development.
- Nationals have the right to participate in national development and, in particular, to be consulted with respect to policies and projects affecting their community.
- All international agreements and relations concluded, established or conducted by the State shall protect and ensure Ethiopia's right to sustainable development.
- The basic aim of development activities shall be to enhance the capacity of citizens for development and to meet their basic needs.

Article 44: Environment Rights

- All persons have the right to live in a clean and healthy environment;
- All persons who have been displaced or whose livelihoods have been adversely affected as a result of state programs have the right to commensurate monetary or alternative means of compensation, including relocation with adequate state assistance.



3.2 Governmental Framework

The Federal constitution, proclamation 7 of 1992, and subsequent proclamations provide the governmental framework, and respective legislative, executive, and judicial responsibilities of institutions serving Ethiopia.

3.2.1 Conservation Strategy of Ethiopia (CSE)

The CSE, approved by the Council of Ministers in 1996, provides a comprehensive and rational approach to environmental management in a very broad sense, covering national and regional strategies, sectoral and cross sectoral policies, action plans and programs as well as providing the basis for development of appropriate institutional and legal frameworks for the implementation (EPA/Ministry of Economic Development and Co-operation 1996, MEDAC). It also deals with providing a strategic framework for integrating environmental planning into a new and existing policies and projects.

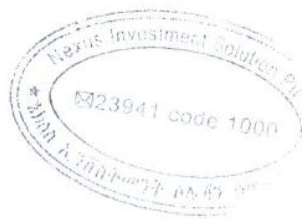
It mainly recognizes the importance of incorporating environmental actors into development activities from the beginning so that planners may take into account environmental protection as an essential component of economic, social and cultural development.

3.2.2 Environmental Protection Authority (EPA) and Environmental

Policy of Ethiopia (EPE) In order to undertake a sustainable management of the resources of the country, the Environmental Protection Authority (EPA), which is directly responsible to the Council of Ministers, was established by Proclamation of the Parliament in September 1995

.The power and duties given to the EPA under the above Proclamation are:

- Prepare environmental protection policy and laws and upon approval, follow up their implementation;
- Prepare directives and systems necessary for evaluating the impact of social and their implementation; and



- Prepare standards that help in the protection of soil; water and air as well as the Biological systems they support, and follow up their implementation

Thus, all project proponents and executing bodies (agencies) in the country are to operate in close co-operation with the EPA to ensure that proper mitigating measures are designed and implemented, particularly for projects with an adverse effect on Environment. The requirement is that an Environmental Impact Statement be prepared by project proponents and be examined, commented on and approved by the EPA. The EPA is the Competent Agency at the Federal level in Ethiopia. It is, therefore, the responsibility of the Authority in the EIA process to:

- Ensure that the proponent complies with the requirements of the EIA process;
- Maintain co-operation and consultation between the different sectoral agencies throughout the EIA process;
- Maintain a close relationship with the proponent and to provide support.
- Evaluate and take decisions on the documents arising out of the EIA process.

At the regional level, the Federal EPA has devolved responsibility to the Regional equivalent to the EPA. The regional authorities should ideally establish an EPA-type institution to deal with environmental issues at the regional level. It is the responsibility of the regional EPA bodies to inform the Federal EPA of projects that may be of national Significance. Therefore, the Federal Authority should only be involved in EIA processes where a proposed activity may:

- Have an environmental effect across the international boundaries of Ethiopia
- Have an environmental effect across regional boundaries within Ethiopia;
- Have an effect on an environment of national or international significance; including but not limited to natural forests, wetlands, national parks, cultural heritage sites etc.;



- Have a Federal government department, the relevant regional authority or another statutory body as the proponent; and,
- Have the Federal Investment Authority as the investment approval body.

Alternatively, Federal EPA may have an EI~ referred to if agreed to between the Federal Authority and the Regional Authority. This would typically happen in complicated EIAs where the Regional authorities feel that it does not have the capacity or competency to deal with the application.

The major policy framework document with respect to environmental management of Ethiopia is the Environmental Policy (EPE) of the FORE approved by the Council of Ministers in April 1997. The Policy was prepared under the joint-effort of the Environmental Protection Authority (EPA) and the Environmental Planning Unit (EPU) of the then Ministry of Economic Development and cooperation (MEDAC)

The EPE supports Constitutional Rights through its guiding principles. The principles are, of course, guiding since they will shape all subsequent policy, strategy and program formulations and their implementation. Sectoral and cross-sectoral policies and environmental elements of other macro policies will be checked against these principles to ensure consistency. From this project perspective; the following are the important one:

- Every person has the right to live in a healthy environment;
- The development, use and management of renewable resources shall be based

On sustainability;

- Appropriate and affordable technologies which use renewable and non-renewable resources efficiently shall be adapted, developed and disseminated;
- Appropriate and affordable technologies which use renewable and non-renewable resources adapted, developed and disseminated.



- Full environmental and social costs (or benefits foregone or lost) that may result through damage to resources or the environment as a result of degradation or pollution shall be incorporated into public and private sector planning and accounting, and decisions shall be based on minimizing and covering these costs;

- Regular and accurate assessment and monitoring of environmental conditions shall be undertaken and the information widely disseminated within the population; and,

- Natural resource and environmental management activities shall be integrated laterally across all sectors and vertically among all levels of organization.

In addition to its Guiding Principles, the EPE provides Sectoral Environmental Policies and Cross-Sectoral Environmental Policies. Environmental Impacts Assessment polices

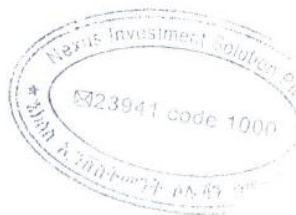
Are included in the later. The EIA policies emphasize e.g. the need of wide range of Impact to be dealt with in EIA, the early recognition of environmental issues in project planning, public participation, mitigation and environmental management and capacity building at all levels of administration.

The policy establishes the authority of the EPA to harmonize Sectoral Development Plans and to implement an environmental management program for the country. It also imparts political and popular support to the sustainable use of natural, human-made and cultural resources at the federal, regional, zonal, Woreda and community levels. The following sectoral environmental polices affect the project directly:

- Pollution from industrial wastes and hazardous materials
- Water, energy, and mineral resources
- Atmospheric pollution and climatic change

Beside these sectoral the following cross sectoral environmental polices also affects the project:

- Environmental impact assessment
- Community participation and involvement



- Environmental education and awareness
- Environmental economics
- Legislation and guidelines.

3.2.2.1 Environmental Pollution Control P

The Ethiopian constitution proclamation of 300,202 Contain a number of article in which are relevant to the concept of pollution control. Article 2 state

- No person shall pollute or cause any other person to pollute the environment by violating the relevant environmental standard,
- The Authority or the relevant Regional environmental agency may take an administrative or legal measure against a person who, in violation of law, releases pollutant to the environment.
- Any person engaged in any field of activity which is likely which is to cause pollution or any other environmental hazard shall, when the Authority or the relevant regional environmental agency so decides, install a sound technology that avoids or reduces, to the required minimum, the generation of waste and, when feasible, apply methods for the recycling of waste.
- Any person who causes any pollution shall hi required to clean up or pay the cost of cleaning up the polluted environment in such a manner and within such a periodas shall be determined by the Authority by the relevant regional environmental agency
- When any activity poses a risk to human health or to the environment, the Authority or the relevant regional environmental agency shall take any necessary measure up to the closure or relocation of any enterprise in order to prevent Harm.



3.2.2.2 Environmental Impact Assessment Proclamation

The Federal constitution, proclamation 299 of 2002 contains a number of articles regarding project development and EIA. Currently, the law on environmental Impact Assessment adopted in Ethiopia. The primary aim of this Proclamation is to make EIA mandatory for specific category of activities under take either by the public or private sectors, and possibly, the extension of EIA to policies, plans and programs in Addition to projects.

The Proclamation elaborates on consideration with respect to the assessment of positive and negative impacts. Categories of projects that will require full EIA (given in an Annex to the Proclamation), not full EIA (some negative impacts expected but not too serious or no EIA (for reasons of "special" or "overriding interests"). Additional directives are to be developed which will determine the particulars of projects listed in the Annex to Proclamation.

The proclamation on environmental Impact Assessment, which complies with the convention of Environmental Impact Assessment in Trans-boundary Context was drafted in 2000 and the proclamation passed by the year 2002.

The provisions of the proclamation include:

- Project will be subjected to EIA and execution is subject to an environmental clearance from the EPA or Regional Government Environmental Agency as applies:
- EPA or the Regional Agency, depending on the magnitude of expected impacts, may waive the requirement of an EIA,
- All other licensing agencies shall, prior to issuing of a license, ensure that either EPA or the regional Environmental Agency has authorized implementation of Project, and



- A licensing agency shall either suspend or cancel a license that has already been Issued, in the case that EPA or the Regional environmental agency suspends or cancels the environmental authorization.

Procedures that must be followed in the EtA process are described in the proclamation

- A proponent shall undertake; a timely environmental impact assessment, identify the likely adverse impacts of his project, and incorporated the means of their prevention, and shall submit to the authority or the relevant regional environmental agency the environmental impact study report together with the necessary documents,

- A proponent shall ensure that an environmental impact assessment is conducted and an environmental impact study report prepared by experts that meet the requirements specified under a directive issued by the authority.

3.2.2.3 Environmental Impact Assessment Guideline

The document provides a background to environmental impacts assessment and environmental management in Ethiopia. The document aims at being a reference to ensure effective environmental assessment and management practice in Ethiopian for all parties who engage in the process.

The document details the required procedures for conducting an ETA in Ethiopia and the requirements for environmental management. The document has been developed to support the ongoing development of environmental legislation. These requirements are presented on a step by-step basis. In addition, the document specifies tools that may be considered when engaging in the EIA process. Reference is made to the legislation and policies that potential investors and developers must comply in Ethiopia and key issues for environmental assessment in specific development sector are detailed for consideration.



3.2.2.4 Guidelines on Strategic Environmental Assessment

The guideline provides the fundamentals to integrate the concept of sustainability into the formulation of plans and programs. SEA aims to ensure that environmental issues are addressed from an early stage in the process of formulating plans and programs at the macro and micro level and are incorporated throughout this process.

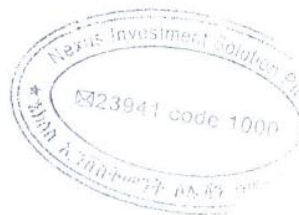
The whole SEA process is intended to act as a support to planners and decision-makers, providing them with relevant environmental information on the positive and negative implications of plans and programs. The guideline has been intended primarily for use by the regional and Federal competent authorities, who have responsibility for environmental issues and also those authorities within the regions who are responsible for drawing up development plans and programs. It is designed to give these authorities a thorough review of the environmental and sustainable development dimensions of the plans and programs.

The approach of assessing the effect of the environment on development is an important benefit of SEA. The guideline proposes an integrative approach, which is one of the differences between SEA and EIA, as EIAs focus on the effect of development on the environment. In some countries an EIA-based approach to SEA is followed, where SEA is used to assess the impacts of a plan or program on the environment. However, an integrative approach is proposed in these Guidelines. This approach considers the opportunities and constraints, which the environment places on the plan or program.

3.2.4.5 Regional Environmental Protection Agencies

Per the proclamation No.295/2002, each National Regional State shall establish an independent regional environmental agency or designate an existing agency that shall, based on the Ethiopian Environmental Policy and Conservation strategy and ensuring public

Participation in the decisions making process be responsible for:



- Formulating policies, strategies, programs" or guidelines pertinent to Environmental protection and follow up its implementation up on approval,
- Regulate and follow up that any development activity is planned and implemented without damaging the environment and disordering its balance, when it comes to environmental impact assessment, the national provisions indicate the Federal EPA devolves responsibilities to the regional environmental body, especially for projects that fully fall under the jurisdiction of the Regional Governments. In the light of this, the regional environmental body is entitled:
- Coordinating the formulation implementation, review and revision of regional conservation strategies, and
- Environmental monitoring, protection and regulation.

The proclamation also states that regional environmental agencies shall ensure the Implementation of federal environmental standards or, as may be appropriate, issue and Implement their own no less stringent standards.

3.2.2.6 Regional

The Oromia region is one of the nine regional states under the Federal system of the Federal Democratic Republic of Ethiopia. Oromia has a total area of about 353,690 km² which covers about 32% of the country's area coverage. The executive body of Oromia regional state is structured under cabinet member and non-cabinet bureaus and agencies. Of these bureaus, the land and environmental protection bureau was established by proclamation No.147/2009. Article 6.1 of the proclamation mandates the bureau to 'formulate policies, strategies, programs, or guidelines pertinent to environmental protection and follow up its implementation up on approval and Article

6.12 of the proclamation gives the bureau power to 'regulate and follow up that any development activity is planned and implemented without damaging the environment and disordering its balance. With regard to EIA, the national provisions indicate the Federal EPA devolves responsibility to the regional environmental office especially for project that fully under the jurisdiction of the regional government.



3.2.2.7 Zone

There are 18 administrative zones in Oromia region where east Shewa zone belongs to them. The zone administration is the highest organ in the administrative zone and is composed of different offices headed by the cabinet and non-cabinet members.

3.2:2.8 Town administrations

The project is located in Adama town, kebele 09. The highest administrative structure of the town is the city council, which is established consisting of the administrative arm and a cabinet. The council has members with two house speakers. The council is structured with the executive and judiciary organs and the police and sector offices under it. The land and environmental protection office in the town is responsible for undertaking the monitoring of environmental protection and management issues at the town level. The most encouraging feature of the existing environmental policy and legislative framework is that it is based on promoting proactive engagement with development promoters rather than adopting a reactive policing stance. Such an approach is essential to reconcile the development need of the country with environmental requirements on the efficient basis.



Chapter-4. Project Descriptions”

4.1 Background to the Project

The primary objective of the Alvima Pvt. Ltd Company is to engage in manufacturing and importing business. Alvima PLC has established and clearly defined its vision: *it is becoming number one destination for higher class product* this will be achieved through becoming a multifaceted company committed to providing maximum customer satisfaction.

The company’s vision is to be implemented through local and external partnership

The company has the following objectives;

- To generate income (profit) to the shareholders;
- To supply quality products for local customers.
- To contribute to the socio-economic development of the nation at large into the food sector in particular.

The study of Alvima PLC aimed at assessing the viability of establishing ultra-modern pasta and macaroni production factory in Ethiopia to produce quality food products for domestic consumption and export markets.

The Alvima PLC's pasta and macaroni processing factory project will process and produce quality pasta and macaroni and enriched foods products both for domestic and foreign markets of neighboring countries, mainly eastern African countries. The company obtains quality wheat from Ethiopian wheat producers, farmers and private investors. In this regard, it will create market for the producers and local farmers. The company will contribute also in technology transfer in producing quality flours for pasta and macaroni production.

The purchased quality wheat will be sorted from unwanted materials using automatic machines. Finally, cleaned and quality wheat are entered into the plant to produce quality pasta and macaroni food products. The project will be implemented by the company managers and professionals. The project will be contributing to sustainable development in Ethiopia by delivering significantly valuable food products which are economically feasible, socially acceptable and environmentally friendly products. The company is aiming to generate product which will have no adverse or/zero impact on environment it will contribute to the



Proponent's procedure of undertaking EIA

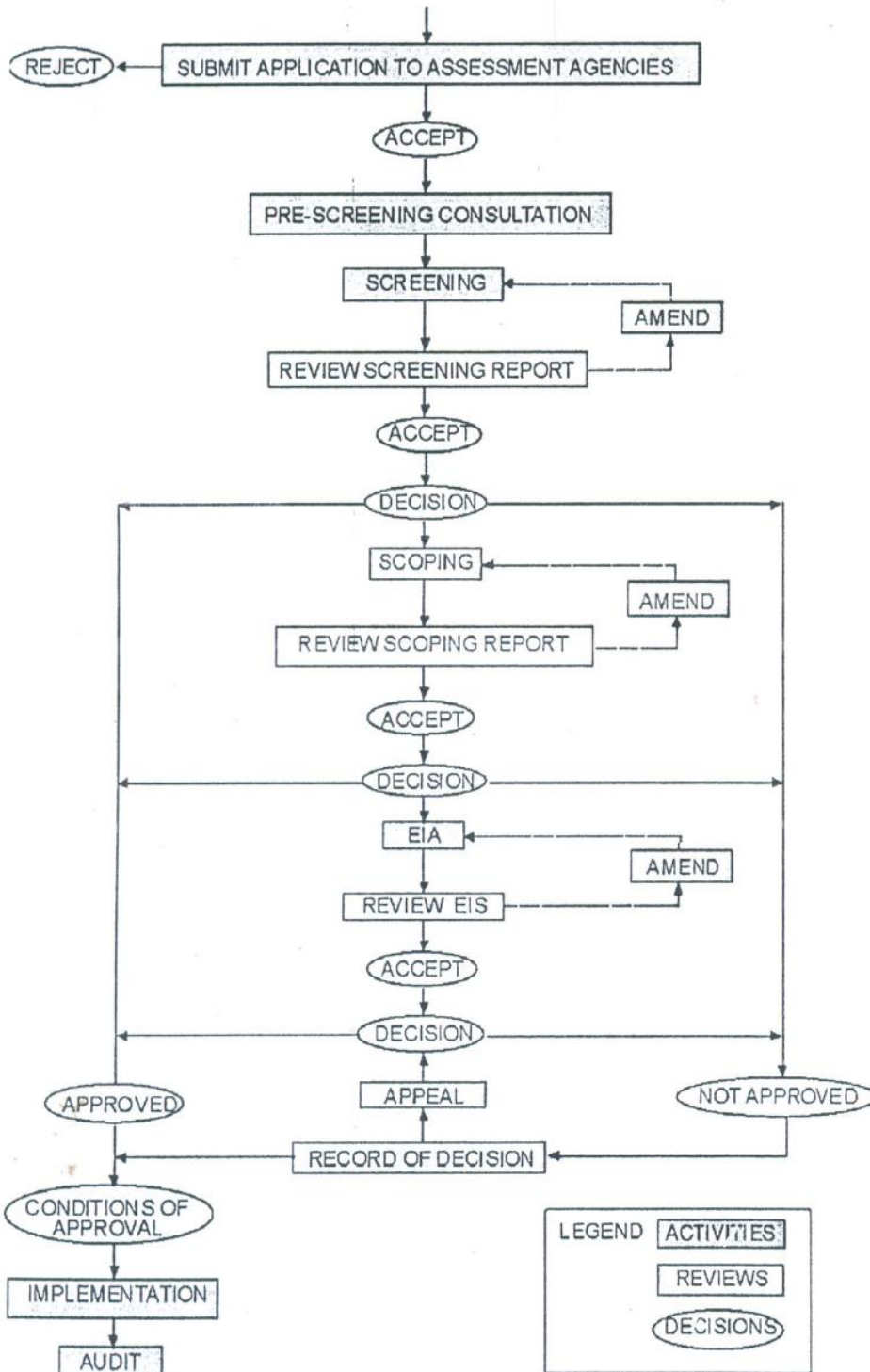


Figure 3.1: EIA Application Process



Delivery of Ethiopia's Sustainable Development and Poverty Reduction Program by creating employment opportunity and generating revenues whilst supporting social and economic development

4.2 Project Goal

The goal of Alvima PLC's Pasta & Macaroni Factory is to become a major producer and exporter of quality pasta and macaroni foods products for the local and foreign markets of neighboring countries.

The company has developed this project having an overall goal of taking advantage existing in pasta and macaroni production and demands in the local and foreign markets and to come out as a successful producer of superior quality pasta and macaroni products.

4.3 Location and area

The pasta and macaroni processing factory will be located in Oromia regional state, Adama town, in the industrial zone of the town, Keble 09, on the way to Wonji close to the new Addis Ababa-Adama asphalt road. The factory will be installed on 11,680m² of land. The specific project site is bordered by new investment; open space prepared for investment, new investment and the new A.A-Adama road in the south, north, east and west, respectively. Pasta and macaroni factory is to be located in 09 Keble of the Adama town.

4.4 Project Objective and Justification

4.4.1 Project Objectives

The proposed project has primary and secondary objectives.

➤ Primary objective:

"To undertake the processing and production of quality pasta and macaroni foods for local and foreign markets of neighboring countries"

➤ Secondary objectives:

- To generate income (profit) to the shareholders;
- To supply quality products for local customers.
- To generate additional employment opportunity among the rural and urban poor,



- To identify other additional markets for the' products and increase values for pasta and macaroni products export,
- Be seen as a model for sustainable development securing' good returns for its business, delivering positive social impacts within local communities and promoting environmental conservations.
- To transfer technology in the sector agro-industry.

4.4.2 Project Justification

The overall performance of the macro economy, as measured by real GOP growth rate, was very encouraging. Ethiopia has continued to register strong economic growth for the seventh time in a row in 2009/10 placing the country in a remarkable growth track. The economy grew 10.4 percent in 2009/10, higher than the estimated growth rate of 6.0 percent for Sub-Saharan Africa (SSA). Agriculture and allied activities with a share of 42 percent in real GOP grew by 7.6 percent contributing 30.2 percent to the 10.4 percent GOP growth in the fiscal year. Service and industry sectors have also played a considerable role in the overall economic growth. industry with a share of 13 percent in total GDP, scaled up by 10.6 percent mainly due to huge investment in electricity and water subsectors. Manufacturing, mining and quarrying as well as construction sectors have also registered remarkable growth to support the overall economic growth. The service sector expanded by 13 percent is contributing 56.6 percent to the annual economic expansion.

A sustained period of such strong growth is rare both in Ethiopia's own economic history and in the experience of other African countries. Indeed, this level of growth is the highest registered among non-oil exporting countries in Africa, and only a handful of other non-oil producing countries worldwide (China among them) have sustained double-digit growth rates during this same time frame. Although growth has been still driven by the agricultural sector, it has been complemented by strong performance in Manufacturing and Construction as well as service sectors.

It is paramount that improved physical, as well as institutional infrastructures exist for any real developmental investments and trade to take efforts assert that main and feeder road construction, electricity ,and telecommunication coverage is positively growing the



On-going transformation program of public institutions to improve service delivery is also a Case in point indicative of the general trend towards transforming institutions.

Ethiopia is very suitable for wheat production due to its favorable climate and fertile soil. However, absence of processing and manufacturing technology that add value for Ethiopia agricultural products in general and wheat crop in particular lead to low prices of crop and even sometimes absence of market for the products. This condition has been discouraging the Ethiopian farmers and producers to produce more wheat. Ethiopia is also nearer to foreign markets like Middle East which are unknown for wheat growing except Saudi Arabia. Therefore, introduction of foods processing particularly pasta and macaroni plant can have various advantages in that create conducive market for the products of local farmer so that they are encouraged to produce more and more wheat

4.5 Description of the Proposed Project (Nature and Scope of the Project)

The shareholders of the company, Alvima Pic, recognizes the enormous potential that exists for developing successful agro-processing business in Ethiopia and believes that it offers an excellent investment opportunity which will provide good returns to investors.

In addition, company believes that the business offers the opportunity to be a model of genuine committed to sustainable development that can maximize valuable return with regards to economical, social and environmental perspectives.

The Ethiopian government recognizes the skills, knowledge and expertise that Mawel Pasta & Macaroni Factory project in order to increase the productivity of wheat through processing foods plant development which is focused agri-business in Ethiopia and to encourage investors who are committed to genuine sustainable development.

In short, the Pasta & Macaroni Factory project offers a highly competitive position for the primary production of quality pasta and macaroni foods-it can deliver throughout the year, reliable, quality, high yield and cost competitive foods. The processed foods currently suffering from supply problems, combined with strategic partnership, provides an excellent opportunity for the Pasta & Macaroni Factory project to capture a strong position in these markets.



4.6 Materials & Inputs

Flour

The Major input to the pasta and flour factory is quality wheat flour. Ethiopia is the second largest producer of wheat in Sub-Saharan Africa. In Ethiopia, wheat is one of the major cereal crops grown between 6 and 14 N latitudes; and between 35 and 42°E longitude ranging in altitude from 1500 to 3200 m. The most suitable regions, however, fall between 1900 and 2700 m. The current total area of production of both durum (*Triticum turgidum* var. *Durum*) and bread wheat (*Triticum aestivum*) is about 861,100 hectares.

Other sources, however, estimate the total area to be 1.2 to 1.5 million hectares. This area is limited to the intermediate altitudes and the highlands despite a potential for irrigated wheat production in the lowlands. In area coverage, durum and bread wheat types hold equal proportions according to a recent survey by a group of wheat Researchers. Bread wheat production, nevertheless, is on the increase. Other Ethiopian wheat species are also cultivated, but to a lesser extent. An example is emmer wheat (*Triticum dicoccum*). Ethiopia is one of the very few countries where *Triticum dicoccum* is still under cultivation. Other species like *Triticum polonium* and *Triticum aethiopicum* are also grown in mixtures with other wheat species.

Flour is found from commercial grinding of clean and *sound hard*, soft or blended wheat with a minimum extraction rate of 78%.

Flour shall have the following characteristics;

Moisture Content: Normal moisture % which is allowed for flour is 12-14%. Anything above is not suitable for bakery purpose.

Gluten: It is rubber like protein which provides the network like structure. It is basically protein. Protein can be classified into two categories: Gliadin and Gluten

Gluten is responsible for unique quality of elasticity /extensibility and resistance. Gluten.



percentage of flour should be between 10- 11.5% (soft wheat flour 9.5-10.5% and hard wheat flour 10.5-11.5%) *Extensibility & Resistance*: Extensibility is the property by which we can define the stretching power of flour without breaking. Resistance is the property by which it opposes any deformation or stretching. *W.A.P (Water Absorption Power)*: Every flour has certain water absorption power so as to make good dough. Generally 60% of flour quantity amounts to the quantity of water. The Ethiopian Standard (ES 1052:2005) provides the following specification for wheat flour.

Table '0:1: 2 Chemical requirements for wheat flour used for baking of breads, biscuits and pasta products

criteria	Standard value
Moisture % by mass (max)	14
Portion on dry base by mass	8-16
Total lashed on dry base % by mass	0.6
Acid insurable (on dry base % by mass)	0.05
Fat acid (on dry base % by mass)	70mg/100mg
Crude fiber (on dry base (% by mass))	
Ph value	0.3
Available carbon dioxide % by mass min	4.9-6.5
Particle size: on 180 micro sieve size % by mass	-99.5
Water absorption % by mass min	60

Wheat Flour

Water



Mixing & Kneading



Extruding



Drying



Packing



Pasta & Macaroni

Mixing and kneading

In the mixing operation, water is added to the milled wheat in a mixing trough to produce dough. Most modern pasta presses are equipped with a vacuum chamber to remove air bubbles from the pasta before extruding. If the air is not removed prior to extruding, small bubbles will form in the pasta which diminish the mechanical strength and give the finished product a white, chalky appearance.

Extruding

After the dough is mixed, it is transferred to the extruder. The extrusion auger not only forces the dough through the die, but it also kneads the dough into a homogeneous mass, controls the rate of production, and influences the overall quality of the finished product. Although construction and dimension of extrusion augers vary by equipment manufacturers, most modern presses have sharp edged augers that have a uniform pitch over their entire length. The auger fits into the grooved extension barrels which help the dough move forward and reduce friction between the auger and the inside of the barrel. Extrusion barrels are equipped with a water cooling jacket to dissipate the heat generated during the extrusion process. The cooling jacket also helps to maintain a constant extrusion temperature, which should be approximately 51° (124°F). If the dough is too hot (above 74° (165°F)) the pasta will be damaged.

Uniform flow rate of the dough through the extruder is also important. Variations in the flow rate of the dough through the die cause the pasta to be extruded at different rates. Products of non uniform size must be discarded or reprocessed, which adds to the unit cost of the product. The inside surface of the die also influences the product appearance. Until recently, most dies were made of bronze, which was relatively soft and required repair or periodic replacement. Recently, dies have been improved by fitting the extruding surface of the die with Teflon inserts to extend the life of the dies and improve the quality of the pasta.



Drying

Drying is the most difficult and critical step to control in the pasta production process. The objective of drying is to lower the moisture content of the pasta from approximately 31 percent to 13 percent so that the finished pasta retains its shape, and without spoil. Most pasta drying operations use a preliminary drier immediately after extrusion to prevent the pasta from sticking together. Pre drying hardens the outside surface of the pasta while keeping the inside soft and plastic. A final drier is then used to remove most of the moisture from the product.

Drying temperature and relative humidity increments are important factors in drying. Since the outside surface of the pasta dries more rapidly than the inside, moisture gradients develop across the surface to the interior of the pasta. If dried too quickly, the pasta will crack, giving the product a poor appearance and very low mechanical strength. Cracking can occur during the drying process or as long as several weeks after the product has left the drier. If the pasta is dried too slowly, it tends to spoil or become moldy during the drying process. Therefore, it is essential that the drying cycle be tailored to meet the requirements of each type of product. If the drying cycle has been successful, the pasta will be firm but also flexible enough so that it can bend to a considerable degree before breaking.

Packaging

Packaging keeps the product free from contamination, protects the pasta from damage during shipment and storage, and displays the product favorably. The principal packaging material for noodles is the cellophane bag, which provides moisture-proof protection for the product and is used easily on automatic packaging machines, but is difficult to stack on grocery shelves. Many manufacturers utilize boxes instead of bags to package pasta because boxes are easy to stack, provide good protection for fragile

Pasta products, and offer the opportunity to print advertising that is easier to read than on bags



Engineering

For the proposed pasta and macaroni factory, the equipment selection parameters Include:

- Equipment Efficiency
- Reliability
- Lower power consumption
- Lower space requirement

A numbers of reputable firms were contacted to present their offer or the supply of machineries. In this regard, Buhler manufactures the best pasta and macaroni line in the world. Buhler is chosen because;

- The machines are known in processing top quality pasta
- The machines are highly durable and installed machines elsewhere are Witnessing the same
- Efficiency in energy consumption and productivity
- Low space requirement

Line Features

Long Cut PastaLine

- Capacity: 1750kgjhr
- Continuous operation
- Equipment's:
 - Mini differential weighing system
 - Water dosing system
 - Polymeric pasta press (mixer & kneading, cooling
 - Facilities, for press cylinder, extruder, spreader, Etc.)
 - Long cut pasta drying line
 - Climate control
 - Packaging



Utilities

Electric Power

The plant is operated with dower of 3 x 400 V and may not exceed the tolerance of 10%. The network frequency of 50 Hz may only be exceeded of max. +/- 1%. Consumption:

Table 0:2: Power Consumption

	Long cut pasta line
Electric	224kw
Heating	287kw
Cooling	70kw

Water

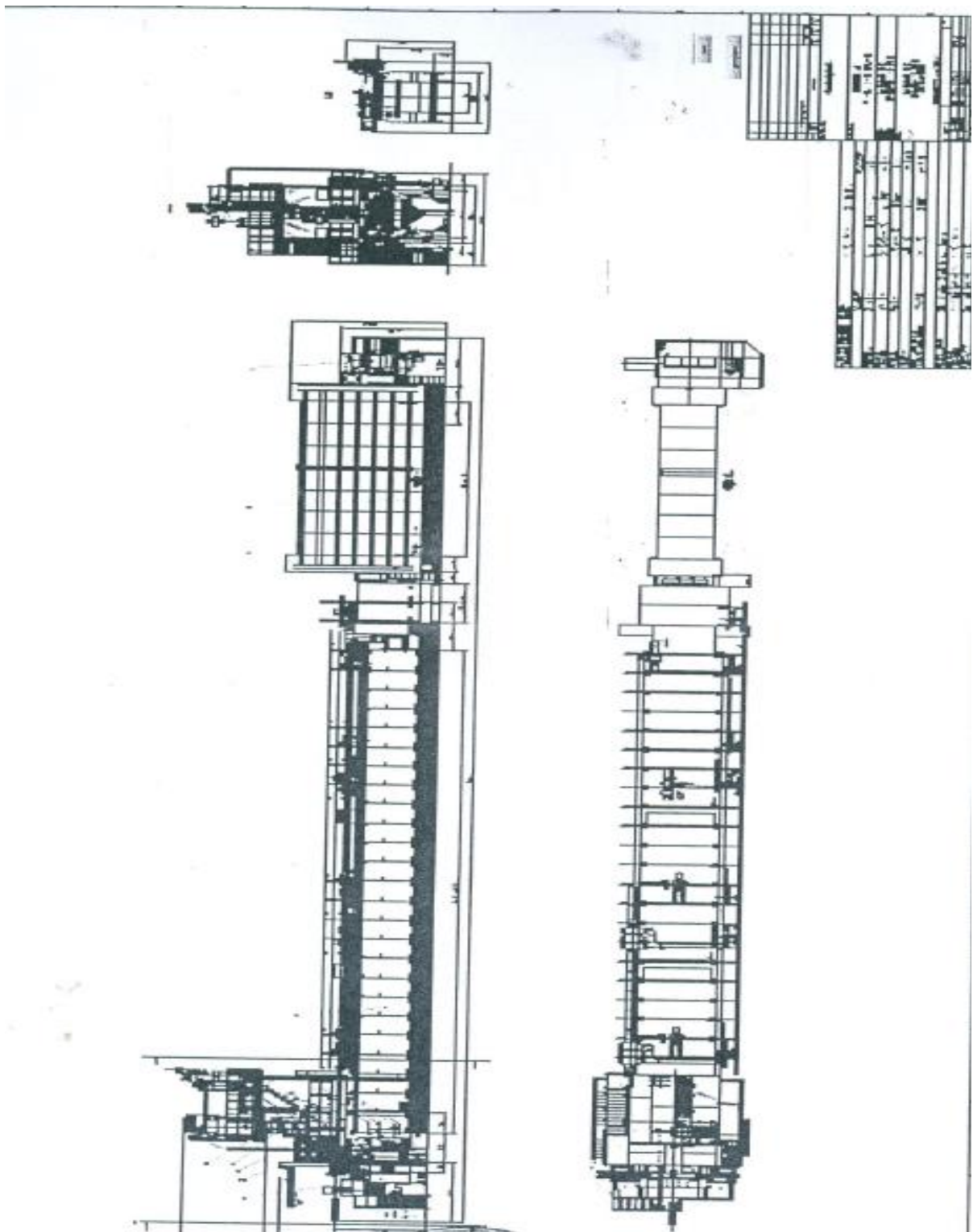
The water consumption is 487 It/hr for long cut pasta

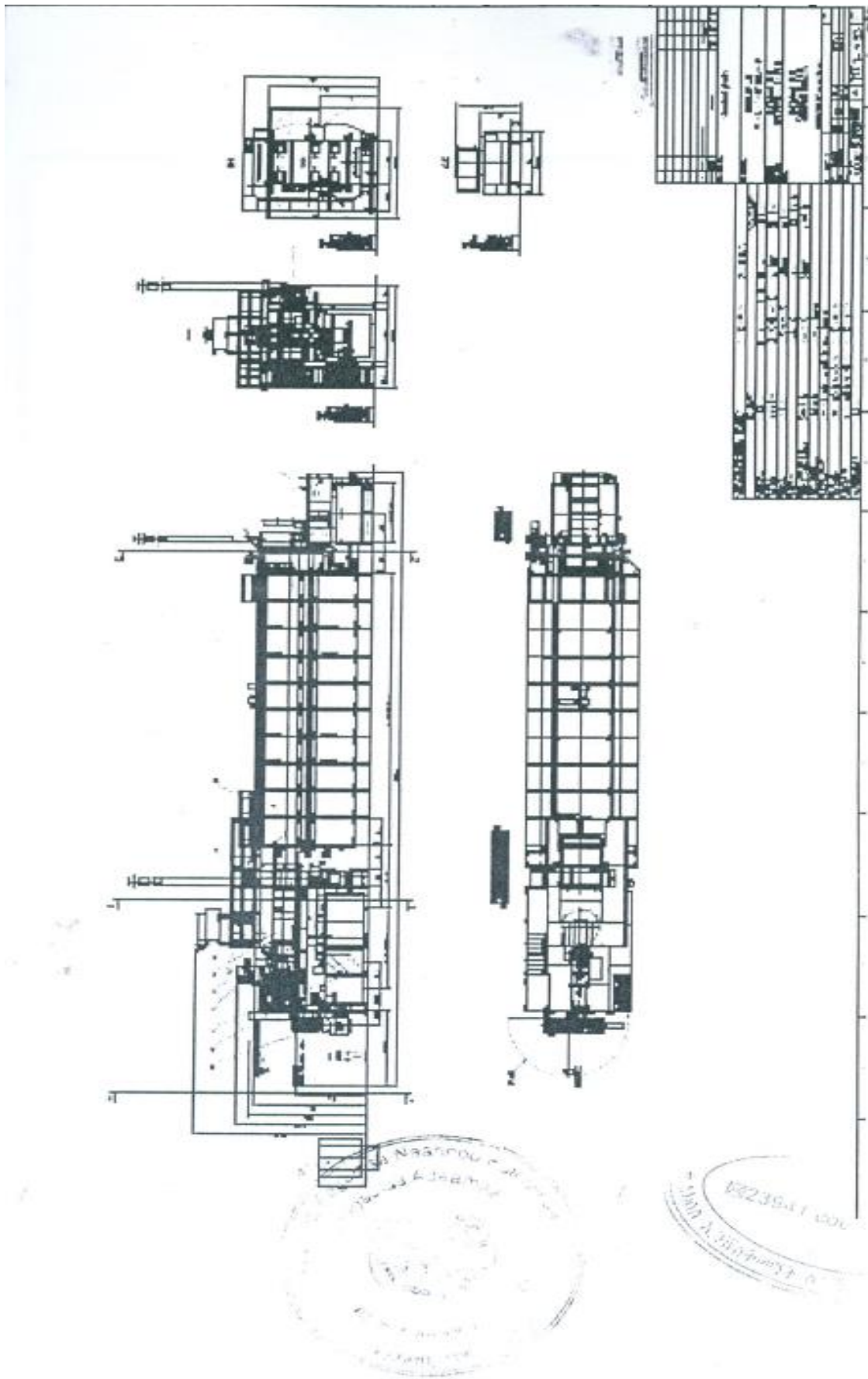
Space Requirement

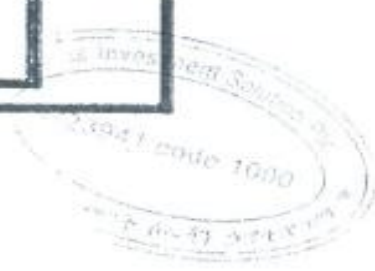
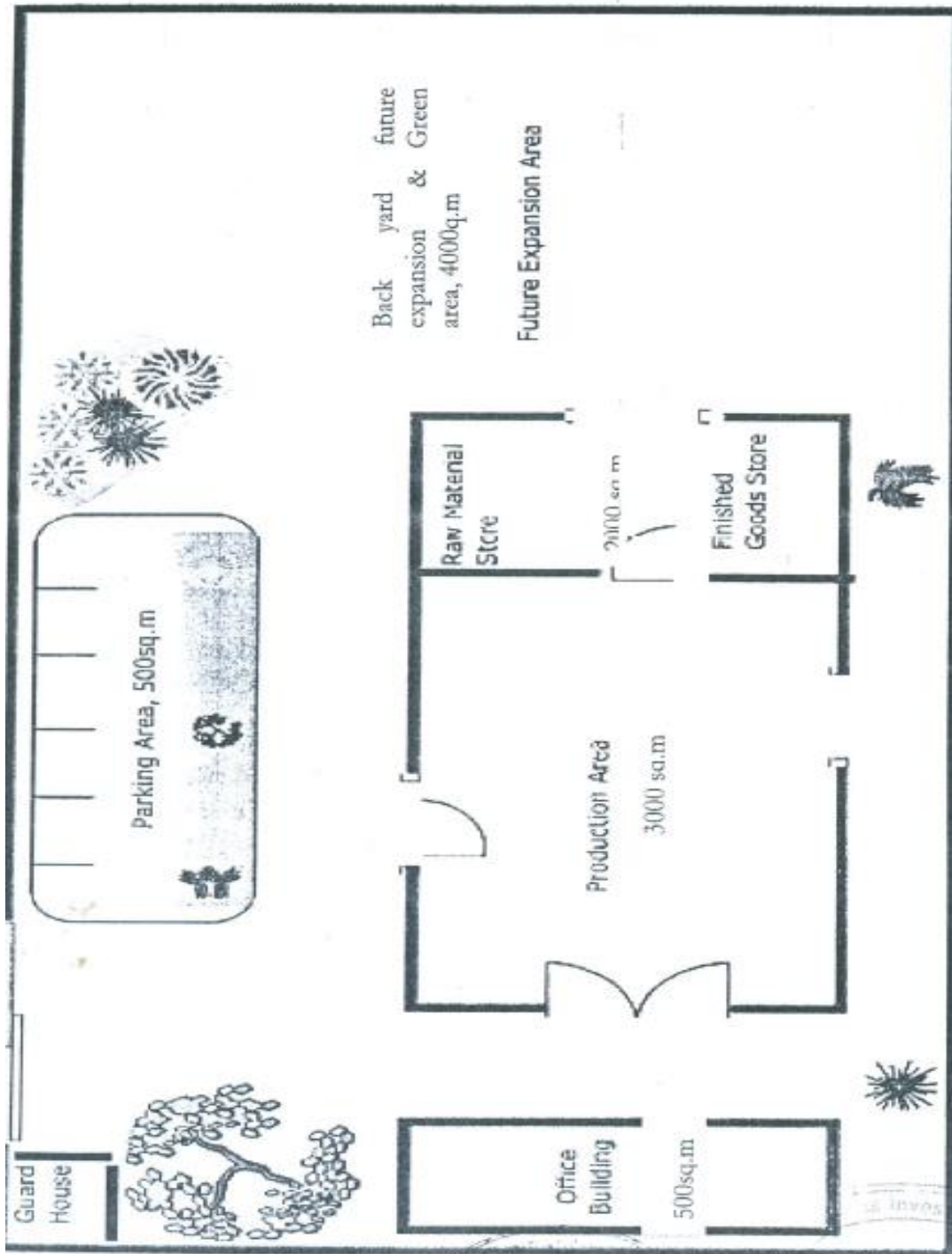
The space requirement (Lx W x H) for the lines as depicted in the drawings bellow are:
Long cut pasta: 63m x6.1m x10m

Hence recommended factory building size is: 80m x12m x 12m (12 meter width 3 m free space on each side). Storage space Flour: and products total 500 sq.









Chapter- 5. Baseline Environmental Conditions of the Project

Environment means surroundings, which are comprised by things and conditions. Pertaining to the Pasta & Macaroni Factory project, both bio-physical and socio-cultural aspects have been considered. Prior to detail description of the project site, a general description of the study area presented.

5.1 Brief Description of the Project Site

The project area is located in the Oromia regional state, Adama, kebele 09, Adama industrial zone. It is situated about 100km to southeast of the capital Addis Ababa along the new Addis Ababa-Adama asphalted road (on the way to Wonji).The project site covers a total area of 11,680m² of land.

The land for this project is obtained from the Oromia Investment Board Investment on the basis of lease. The project specific site is bordered by sites for future industrial establishments.

5.1.1 Physical Environment

The region offers a relatively uniform climate in terms of minimum and maximum temperature and daylight hours, with most important parameters within the optimum range for agro-food processing factory. The area is classified as Kola agro-climate, which has no adverse impact on the factory as well as its employees.

Topography

The topographic condition of the project site can be expressed based on qualitative and actual value (quantitative) based. The qualitative approach describes the project site's relative topographic feature with respect to the local topographic condition. In this regard, the area is classified under flat topography. An estimated project site's elevation is almost 1650-1700 m a.s.l.

Geology and Soils

General geology

The project site lies in the awash basin of the country. This region is mainly covered by volcanic rocks. The area is dominated by flat plains with some rising escarpment. Geologically, the project site is one of the stable areas, where events of volcanic movements may rarely occur.



Soil Types

The dominant soils expected at the project site are those which originated from volcanic parent materials. Thus, soils of the area are volcanic origin soils and alluvial deposits from highlands which are contributed by run-off and excessive erosions from the upper lands.

Climate

Ethiopia is situated within the tropics and therefore is subject to comparatively small seasonal variations in temperature, but experiences considerable diurnal fluctuations in temperature. However, the project area shows great seasonal variation in rainfall and humidity. Most of the annual rainfall occurs between late June and mid September.

- During this period, the large low pressure zone located over the Indian Ocean and the Arabian Sea dominate the airflow and there is a strong movement of moist air from Southwest to Northeast, i.e. From the high pressure center over the Gulf of Guinea (Atlantic Ocean) towards the low pressure center of Arabia.

This movement carries warm, moist, unstable air masses from the Congo basin to Ethiopia and is the largest source of rainwater. The driest time of the year is usually the months of November to January, when the prevailing winds are the northeast trades, During this period. In most years a shorter period of fairly heavy rainfall (the little rains) can be distinguished sometime between February and May. But in some years this scarcely occurs, and in other years there is no very obvious interruption between the rains of the main wet season and the period of the small rains. The weather throughout the Ethiopian highlands may vary considerably from one year to another. This is **due to** the passage of the Inter tropical Convergence Zone over Ethiopia.

Rainfall

In Ethiopia, fourteen rainfall regions are recognized based on whether. The rain months are continuously distributed (type I) or there are two rainy "seasons".

The project area is characterized by two rainy seasons. Like most of the regions of the country, Adama and its surrounding is located in regime 110. Regime 110 is characterized by six rainy months from March to April and June to September. The small rains are in

March, and April and the big rains are from June to September with very high concentrations in July and August.



From the long-term rainfall data of the study area, the precipitation of the area shows large seasonal and inter annual variability. The precipitation is recorded in the Agricultural Research Institute showed the project area receives an average rainfall ranging from 890mm per annum.

Temperature

Generally, months of March, April, May, and June, have the highest average temperatures while November, December and January have the lowest. The maximum temperature reaches as high as 28°C, in May while the minimum temperature gets as low as 15°C in December.

Water Resources

Surface Waters

No river or lake water is reported to exist nearby of the project area. The Pasta & Macaroni Factory project will use borehole for the processing and production of foods products.

Groundwater

Ground water is present at relatively shallow depth, which makes easy available for different purposes.

5.1.2 Biological Environment

Vegetation

The project site has no vegetation cover since the area has been removed of vegetation for settlement and cultivation. Many natural trees have been cleared and destroyed for agricultural purposes and settlements long years ago.

Wildlife

According to local sources, no wild life exists in the project area.

5.1.3 Socio-Economic Environment

The project will be at the edge of ensuring sustainable development, delivering economically, socially and environmentally important values. It will contribute to the delivery of Ethiopia's Sustainable Development and Poverty Reduction Program by creating employment and export revenues whilst supporting social development through Fair Trade.

The pasta and macaroni processing plant project has been designed to ensure sustainable development and delivering economically, socially and environmental achieve the objectives of Ethiopia's Sustainable development and poverty reduction



Program in the country as well as contributing to the delver of the UN Millennium Development Goals in Ethiopia.

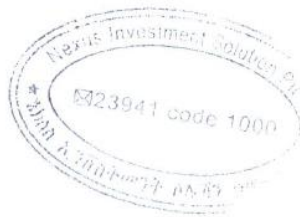
Key elements are:

- *An economically successfully business:* the project will deliver attractive returns for Investors and tax income for the Ethiopian government. Pasta and macaroni will be processed in Ethiopia thereby adding significant value to the product in-country. The food products will be exported providing foreign currency revenue for Ethiopia and helping the trade balance;
- *Skills and technology transfer:* the project will commercialize at high technology processing facilities. Best-in-class agricultural industry practice will be implemented and disseminated in the region through technical support to growers;
- *building capacity:* management and technical capacity of local staff will be increased and is planned for Ethiopian staff to follow in the international team's footsteps once the business is up and running;
- *Sustainable employment:* processing foods is labor intensive and the project will bring a high level of employment and income potential to rural communities;
- *Minimized carbon-footprint and waste operation:* The Foods Plant Company will strive to recycle the maximum amount of waste resulting from all its activities on the processing plant;

5. 1.3. 1- Economic aspect

The project demonstrates strong economic fundamentals, providing good returns to all shareholders, being the developers, the government and the local community. It also will stimulate substantial economic activity in the surrounding region through:

- Supply of materials for the processing plant,
- Supply of services,
- Supply of labor,
- Supply of inputs,



5.1.4 Environmental strategy

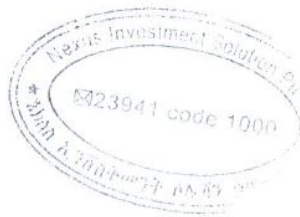
The Pasta & Macaroni Factory project will implement a comprehensive environmental strategy and targets have been set to become a zero waste operation and aims for a low carbon footprint. The Foods Company will follow global GAP standards, which includes having a detailed waste management plan

A detailed study to define a renewable energy execution plan will be completed. This will review options such as producing energy (heat, electricity) from by-products through anaerobic digestion; producing liquid bio-fuels, for power generation as well as transport fuels from food processing by-products. Biodiversity in the species selected for windbreaks and other open areas will be supported. The Pasta & Macaroni Factory project will also actively create and manage habitats and biotopes on the site, to ensure the maximum feasible population, on a commercial plantation of species of trees, protection and conservation of birds and insects.

5.1.5 Social Aspects

5.1.5.1 Settlement Pattern

As the proposed project is planned to be located in Adama town, Adam industrial area, population of the mentioned area are mainly employees working in the plant. The residents of the town are at fair distance from the factory. The project provides employment opportunities for a total number of 150 people, 50 technical employees And 90 female workers from the residents of Adama town, which are found closer to the factory.



5.1.5.2 Social Livelihood

The livelihood of the people around the project area is primarily based on commerce and trade. Means of livelihood for local people come from trade and commerce.

Education

Regarding the educational facility found around the project site, there are primary to secondary level schools to which the local population community sends its children.

Public Health

There are public health services around the project area, which serve local people and residents from rural areas. Patients who are seriously sick will be sent for further treatment and checkup either to Addis Ababa City for referral or to Adama Hospital.

5.1.5.3 Utility Services

Water Supply and Sanitarian

According to local people sources interviewed during the field visit, the main source of potable water around the project site is boreholes and tap water. The town's water supply is in charge of supplying needy people with potable water. The water consumption is 487lt/hr for long cut pasta.

Energy Sources

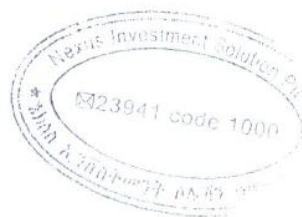
There is electric power supply near the project site. The energy need of the local people, however; depends mainly on traditional sources like fire wood, biomass fuel, charcoal, crop residue and animal dung.

The plant is operated with power of 3x400 V and may not exceed the tolerance of +/-10%. The network frequency of 50 Hz may only be exceeded of max +/-1%.

Consumption:

Table 0.1: Power consumption

	Long cut pasta line
Electric	224kw
Heating	287kw
Cooling	70kw



5.1.5.6 Historical, Cultural, Religious and Archeological Resources

There is no reported historical or archeological resource in the project area to impact by the project. During field visit, the consultant does not encounter any site of historical, cultural, religious and archeological importance located in or near the project area. Enquiries to residents around the project have indicated that there are no known sites of historical or archeological significance in the vicinity of the food processing plant.

5.1.5.7 Public Consultation and social Acceptability of the Project

Public consultation was undertaken, for identifying issues (during scoping) and during impact study. During the impact study, individuals were informally interviewed. The consultation involved residents/employees living in the area close to the project site. The participants were men, women, and the youth group living in the target community.

Due to the presence of large numbers of unemployed people and distance they are traveling to get jobs, during the public consultation, it was noticed that local people have positive attitude toward the implementation of the proposed processing plant project. Laborers in the project site expect the immediate implementation of the project plan and socio-economic advantages they may obtain from commencement of the project operation.

5.1.5.8 Gender Equity Issues

There is gender inequality in the project area as it is the cases in most part of Ethiopia Woman manage the bulk of house hold affairs in the area, like food preparation and marketing, fetching water, collecting fire wood, and caring for children, the elderly and the sick. On fields, they work with men in land leveling, weeding and harvesting. They are also responsible for milking and providing foddors for animals, mainly cows which graze the homestead.



Chapter 6. Environmental Impacts Assessment and Proposed Mitigation Measures

This part of the report addresses potential impacts associated with the proposed project and measures for both mitigating (i.e. avoidance, reduction, or restorations of) negative impacts, and enhancing (i.e. improvements of) positive effects of the food processing and production plant project. The major positive impacts of the proposed project are mainly those of economic benefits at the national, regional and local level due to the earning of foreign exchange and creation of employment opportunities, and technology transfer to citizens working in the project, while adverse impacts are mainly resulting from processing of the foods particularly, dust and solid waste related problems.

As major raw materials (inputs) for the processing and manufacturing of foods are wheat flour, flavor of different types, bicarbonate, salt, sugar, skimmed milk powder, starch powder, water, power, etc. impacts on human health and surrounding ecosystem are expected to generate from the process of production unless the project is properly planned and managed will. Besides, health safety and adverse effects on employees' health condition, pollution effects on ambient air quality, and disturbance of top soils during construction are sources of impacts.

6.1 Beneficial impacts

6.1.1 Employment creations

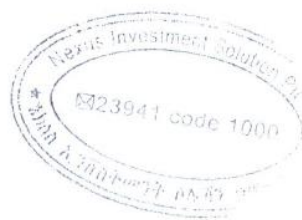
Impact Origin and Characteristics

The direct and indirect employment opportunity to be created for citizens is the economic benefits of the project beyond to other economic output discussed.

The feasibility study of the project indicates that Pasta & Macaroni factory project creates direct job opportunities for a total of 150 workers in which most of them to be the local residents. Therefore, the project will be an opportunity for the diversification of the currently existing subsistent agricultural based economic activity in the area. This economic diversification will not be limited to the local economic base, but it will benefit the town as a whole.

Benefit Enhancement Measures

Special consideration is given to enhancement of the positive effects of the project by maximizing the distribution of this employment related project benefit. The team considered the benefits is at national and local levels.



Hiring local professionals and service providers where possible, enhances the benefit at regional level. Requirement of local available labor for positions that do not require skill enhances the benefits at local level. Although labor requirement at the construction stage of the project is a matter for the contractors, who have the right to determine whom they shall and shall not employ, they should be encouraged to hire local laborers wherever possible. The measure not only maximizes the distribution of the benefit, but also promotes the projects social acceptability.

In addition to the above proposed measures that can enhance the direct employment benefits, procuring supplier and services from local sources to the maximum extent possible at each stage of the project enhances the indirect employment opportunity of the project.

6.1.2 Investment

Impact Origin and Characteristics

The total investment cost of the project is estimated to be Birr 137,677,257 of this, Birr 120,796,003 is the cost of fixed investment items while the working capital and preparation interest cost covers the remaining. The financial plan indicates that the project's investment cost will be covered from owner's equity and Bank loan. Out of the total planned investment of Birr 137,677,257 Owner's equity is expected to cover birr 43,204,257 and while the rest Birr 94,473,000 will be covered from the bank loan.

This will have a significant input on the investment capacity, most importantly at region level.

Benefit Enhancement Measures

Complying with public and private requirements and producing at low costs of production maximizes benefits from the investment. Although, they require effort of external institution and governmental bodies, facilitating the investment process, including development credits enhances the benefit.

6.1.3 Social Benefits

Local income Generation and Livelihood Improvement

Impact Origin and Characteristics

The employment opportunity to be created by the project will have social benefit beside the expected economic benefit. The employment income from the project will have a substantial role for social livelihood improvement in the project area. This local income generation related social benefit will have long term as well as cumulative benefits:



Poverty reduction: As a result of creation of jobs the project will have a meaningful impact on poverty reduction as the project area is inhabited by largely unemployed and marginal farmers, the employment priorities would focus on households subsisting below the poverty line.

Education opportunity particularly girls: the increased income from the employment in the project will improve substantially the living standard of the immediate area. Due to their improved income families can afford to send their children to schools and supply their school needs adequately.

Benefit Enhancement Measures

Utilization of the available labor force in the area enhances the benefits at local level. Out sourcing commercial activities like cafeteria services for local competitive service providers maximizes the social benefit of the project as well.

6.1.4 Gender equity and Employment Opportunities

Impact Origin and Characteristics

Women efficiency in carrying out and handing assignment make them preferable for the foods plant production processes. In this factory, from the total 150 employees required, 90 employment opportunities will be given for women. This gender specific opportunity will avoid the historical disproportionate burden of unemployment on woman.

Benefit Enhancement Measures

Consideration to be given for keeping the above beneficial opportunity the project provider to women and actions to avoid work area problems women can face. The actions to be taken include:

- Strict rule on work area sexual harassments,
- Job security,
- Appropriate payment (equal payment standard with men engaged on equivalent work load).

6.1.5 Rural and Urban Development

Impact Origin and Characteristics

The implementation of the project is expected to contribute to the development of institution that would prove social services to the local community. Since the project is expected to involve hundreds of workers this by itself induces the establishments of medical and other service giving centers.



Beside this project development induced rural-urban development potentials, according to the projects proponents' explanation; they have a pack of plan for participating social services development programs. As part of this EIA study, the proponent assigned the team to assess problem areas concerning social services and prioritize according to the interest of the community.

Benefit Enhancement Measures

Consideration is given to measures that can maximize the benefits the local community can obtain from the development of the services intended by the proponent. Integrating local knowledge's at each stage of the intended program implementation will maximize the benefit of the services. Participating the local administrative and community during planning implementation & management is not only be an opportunity for facilitating the process but also makes the community to consider the services as their property.

6.2 Potential Adverse Impacts and Proposed Mitigation Measures

The proposed project is characterized with significant pre-construction phase; construction phase and operation phase negative impacts. This section of the report outlines these adverse impacts and presents the proposed mitigation measures.

6.2.1 Pre-construction Phase Impacts

Potential negative impacts associated with the pre-construction phase activates of the project include:

- Loss of income and assets of local residents who uses the area for economic purpose,

Impact Origin and Characteristic

The project has impacts on some people who may lose income and assets.

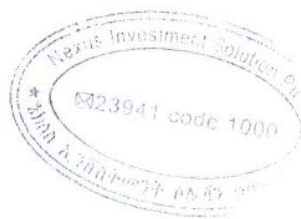
Mitigation Measures

Due care is given to those people whose property is lost and appropriate compensation will be paid.

6.2.2 Construction Phase Negative Impacts and Mitigation Measures

The construction phase of the project involves clearing, land leveling, transportation of construction materials, and installation of machineries, which these activist will have adverse impact on:

- Top soils,
- People nearby the area,



- Impact on Air quality
- Work area accidents and hazards

Alteration of land use pattern

Impact Origin and Characteristic

Land clearing and leveling as well as dumping of excavated soil materials can be a cause for the alteration of landscape integrity in the project area. The land clearing work involves moving of top soils and removal of grasses. Such activities can be a possible impact origin for alteration of landscape integrity; from the existing environmental feature of the project area point of view, the impact from land clearing and leveling will be significant.

Mitigation Measures

Though the above described impacts are significant they can be avoided by undertaking the following mitigation measures:

- Grade limitation to avoid spoiling scenery and view lines with earthworks,
- Dumping excavated soil materials at selected site and re-shaping it with the dumping site,
- Creating awareness on the value of conserving biodiversity in general and indigenous species in particular among the workers engaged on the construction activity.
- Minimizing the movement of vehicles and construction machineries particularly outside the premise of the project site to avoid further destruction.

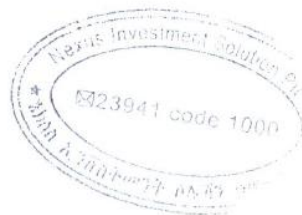
Impact on Water

Impact Origin and Characteristic

Although it will be much lower than that of required for the operation phase of the project, the construction phase of the project requires relatively high volume of water but this may not have impact on existing groundwater source. Besides, during the construction phase of the project, foreign materials like oil, grease, debris, byproducts from the construction process that are thrown away solid wastes can originate. However, the materials may not have potential threats for groundwater quality degradation.

Runoffs from the site can enter the source and can cause water quality degradation, particularly the depletion of dissolved oxygen (DO) an aquatic life sustaining ingredient.

Alteration of the natural water cycle is another water resource impact in relation to the construction phase of the project. As the project comprises the construction of



Buildings, and other structures to be used for different purposes; the project will have pressure on existing local materials including soil resource. However, both from the level of the project implementation and character of the project, existing project impacts are manageable at this phase.

Mitigation Measures:

The following measures mitigate the impacts:

- Limit water withdrawal to the amount that will not adversely affect the groundwater balance and the demand of the local community, by developing and conserving own source of water.
- Make use of construction materials coming from authorized quarry site,
- Contribute to the rehabilitation of quarry site,
- Carefully excavating, storage and reuse of removed top soils.

Impact on Air Quality

Impact Origin and Characteristic

Local land degradation due to earth moving operation during the site preparation and land leveling is may be an area of concern of the project during the construction stage of the project. As the impact that can arise from the problem is localized, the contribution of the project construction to air quality degradation is low. However, as the dust storm can have visibility impact on site operation and decrease breathing problem because of the suspended particles in the air, the problem is an important issue that requires consideration.

Mitigation Measures:

- To avoid consequence of visibility loss during operation, the practical option is to sprinkle water on fresh construction spoil, and
- To instruct the site workers on the procedures of construction and safety precaution.

6.2.2.5 Nuisance Noise

Impact Origin and Characteristic

Construction involves the operation of machinery and movements of vehicles. As a result, some noise pollution is expected in and close to the project site. However, because of the fact that settlements are near the project site, the noise impact on the local population needs due care. However, the production process doesn't involve the use of explosives and thus does not entail significant noise that affects human population.



- The operation is conducted during daytime where most of the people are in the field.
- Avoid institutions sensitive to noise such as settlement, schools, health institution or other offices close to the project site.

6.2.2.6 Work Accident

Impact origin and Characteristic

Short duration increase in the traffic in the process of delivering supplies to the construction site coupled with the concentration of casual labour can potentially increase accident. Moreover, visibility problem that may be caused by dust storm during clearing and land leveling may create accident problem in the site operation.

Mitigation Measures

The following proposed measures mitigate the impact:

- Train and equip some of the workers to voluntarily serve as a traffic service person during the beginning and end of daily work,
- Aware workforce on the safety issues during site operation and on road safety,
- Put in place necessary sign post on site and near the gate.

6.2.2.7 Women's Perspective

Impact origin and characteristic

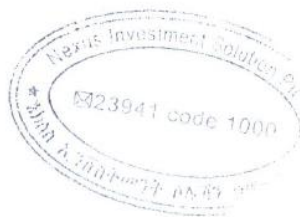
The proposed project is beneficial for women. But, some adverse impacts may arise due to additional work load and responsibilities as a result of immigrants in the area. Women in the area might be exposed to risk of sexually transmitted diseases.

Mitigation Measures

- Awareness creation among the women community and for the workers deployed in the area would minimize the impacts.
- Availing condoms at the project premises & promotion of its use shall be undertaken in collaboration with the local health institutions.

6.2.3 Operational Phase Adverse Impacts Identification

As the operational phase is the main source of environmental issue of the project; in assessing these impacts the consultant preferred to follow an approach that provides realistic background information on the environmental assessment process.



The approach considers; the environmental aspects, the environmental impacts and the viable (both environmentally, technically and economically) mitigation measures.

- Identification of the Environmental Aspects of the Foods processing and production process
- Cause and effect analysis between the environmental aspects and potential impacts
- Impact assessment and identifying sustainable impact mitigation measures.

6.2.3.1 Identification of Environmental Aspects

The environmental aspects of the Pasta & macaroni factory project can be classified into the following major environmental aspects:

- Use of wheat flours and flavor ingredients as main raw materials in the production process,
- Use of 487 liters of water per hour as input during production process,
- Generation of liquid and solid wastes,
- Electricity power consumption, and
- Induced development

Table 6.1 below describes this main environmental aspect and their significance from impact causing point of view.

Table 6.1: Operational Phase Environmental Aspects and Significance

No	Environmental Aspect	Significance
1	Use of raw materials	
1.1	Impact on quality of air	Moderately significant impacts
1.2	Impacts on employees; health safety	Moderately significant impact
2	Use of water during processing	
2.1	Generation of wastewater	Moderately significant impact
2.2	Generation of solid wastes	Less significant impact



2.3	Generation of dust emission	Highly significant impact
2.4	Generation of offensive odor	Less significant impact
3.0	Generation of employment	Highly significant impact

6.2.3.2 Cause and Effect Analysis

Checklists, matrices (including modified Leopid Matrix) were used to analyze the relation between those identified environmental aspects and the impact they can induce on the environment, Apart from this, the consulting firm assessed past experiences, case studies and employed experts' knowledge for the analysis.

The consultant's cause and effect analysis indicates that: generation of dust emission will be highly significant adverse environmental impacts while generation of employment is expected to be highly significant socio-economic beneficial impacts.

Adverse health hazards on employees, ambient air quality deterioration and generation of wastewater shall be moderately significant environmental impacts of the processing foods project.

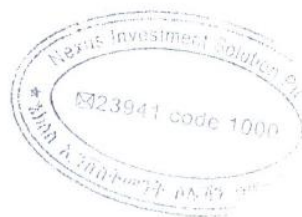
Solid wastes and offensive odors expected from the factory production process will be less significant impacts.

6.2.3.2.1 Raw Materials Use Caused Adverse Impacts

The Pasta & Macaroni Factory project will use wheat flours and different kinds of foods products quality improving ingredients as raw materials. It also uses water as an important input. The use of these raw materials will have moderately significant adverse environmental impacts on ambient air and cause immediate air quality degradation and employees' health conditions unless properly handled. Therefore, the expected adverse pollution impacts from raw materials will be ambient air quality depletion and health effects on employees due to presence of dusts and particulate matters.

Mitigation measures

- Suppress dust emissions using dust scrapers fans,
- Plant trees around the factory premises,
- Provide employees with protective devices like and mouth masks, hand gloves



6.2.3.2 Employees' Health Hazard

Employees' health hazard is high if protective devices are not provided to them. Inhalation of contaminated air, absorption of floating particulates in the surrounding air, and ingestion of pollutants during eating, smoking and drinking are significantly high in foods processing factory.

Mitigation Measures

- Provide employees with protective devices
- Train employees on safety precautions

6.2.3.3 Soil and Groundwater pollution

The foods processing and production does generate insignificant amount of wastewater that bring damage to the surface and ground water sources and soils.

6.2.3.4 Economic Development Induced Adverse Impacts

Socio-cultural Impact

Impact Origin and Characteristics

As described earlier, the project is likely to have some change to socio economic situation of the area. The livelihood of the surrounding area will gradually shift from own subsistence means of live to salary-based livelihood. This shift which may induce change in the life style will have a short-term to medium-term consequence. Household resource management conflict, traditional social hierarchy and value system may be changed.

Socio-Economic Impacts

Impact Origin and Characteristics

Employees' health hazard and work area impacts particularly impacts that can make workers handicap will have a cumulative socio-economic impacts. The cumulative impact of employee's health hazard particularly, work area caused accidents related partial or total handicappers will have significant social impact on the worker and economic impacts for his/her family in particular.

Mitigation Measures

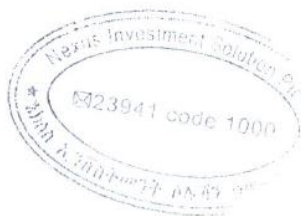
In addition those recommendations that prevents the root cause of the impacts (i.e. preventing and controlling work area health hazards); facilitating insurance policy and procedures for work area caused body damages particular for permanent workers is the proposed mitigation.



Chapter 7. Analysis of Alternatives

The sustainability goal of the project can be addressed if and only if the project is environmentally, socially and economically sound. To achieve this; the consultant considered different project alternative and analysis from there sustainability dimensions. The alternative analysis focused on those significant negative impacts of the project (i.e. dust emission and air pollution, and workmanship health hazard). As environmental pollution and employees health hazards are prominently related with the nature of raw materials in use; due emphasis is given to dust emissions management and constant keeping of the plant compound cleanliness were considered and evaluated.

The 'no project' option was also raised and analyzed. With existing demand for foods products markets and profitability of the project in raising national revenue and employment opportunity, the 'no project' option was discarded. Implementation of the project at specified location by employing possible means of avoiding environmental hazards was the option outweigh among proposed alternative options.



Chapter 8. Environmental Management Plan

Environmental management is concerned with the implementation of measures necessary to minimize or offset adverse impacts and to enhance beneficial impacts. Unless the mitigation and benefit enhancement measures identified in the EIA are fully implemented, the prime function of EIA, which is to provide a basis for shaping the project so that overall environmental performance is enhanced, cannot be achieved.

In order to be effective, environment management must be fully integrated with the overall project management effort at all levels, which itself should be aimed at providing a high level of quality control, leading to a project which has been properly designed, constructed and functional with possible efficiency throughout its life time. Hence, the overall goal of the Environmental Management Plan (EMP) of the Pasta & Macaroni Factory project is to minimize adverse impacts of the project by managing and implementing the proposed impact mitigation measures and introducing good environmental management practices.

Under this section, specific management activities (at the pre-construction, construction and operation phases) of the project to overcome possible impacts of the project activities are outlined.

8.1 Pre-Construction Phase environmental management plan

Prior to the construction and installation of the pasta and macaroni factory project, environmental management will be considered with five principal groups:

- Ensuring that all government and concerned agency requirements and procedures related to EIA are complete with,
- Implementations of land acquisition procedures including the payment of compensation for affected local community if any,
- Selecting of technologies, machineries and process units in a manner that minimizes adverse impacts and enhancing beneficial impacts,
- Preparation of site layout, which incorporates specific features aimed at minimizing adverse impacts and enhancing beneficial impacts.

Since the project promoter, Pasta & Macaroni Factory project will be responsible for handling the above issues before the start of construction works; the company will hire appropriate personnel who facilitate these activities and inter institutional relationships for the environmental management and safety assurance as well.

The Oromia Rural Land and Environmental Protection Bureau (ORLEPB) will be responsible for ensuring that environmental requirements are fully met in the EIA study report.



8.2 Construction Phase environmental management plan

During constructions and installation of buildings and machineries, the contractor will be responsible for implementing the environmental mitigation measures proposed in the EIA study report. The construction supervisor shall monitor impacts and their proper implementation of mitigation measures. He/She will be fully responsible for ensuring that all the works to be carried out in accordance with the specifications and designs that the environmental impacts will be taken into consideration for ensuring good working environmental management established.

It is proposed that an environmental inspector is to be assigned by the project proponent. The environmental inspector shall monitor major environmental management mitigation actions during the construction phase. The following will be taken into account while monitoring:

8.2.1 Site Preparation Management

The site preparation for installations buildings and machineries will be done by taking care of soils, landscape and employees health safety.

8.2.2 Liquid and Solid Wastes Management

All solid and liquid wastes generated from the construction activities should be managed properly. Solid wastes must be collected and burnt in a burn pit specially created for this purpose. These burning pits must be placed away from the groundwater well head, seasonal wetland and covered up after completion of the construction work.

All the used materials from the factory plant and equipment must be collected and burned or buried in specially secured landfill effectively sealed from the surroundings. Environmental inspector has to ensure the proper implementation of these activities and submit report of the status of environmental management to the company and concerning local authorities.

8.2.3 Air pollution and dust emissions management

The construction action is the major source of dust emission and ambient air pollution. However, it can be managed by:

- Discarding construction wastes in an appropriate or authorized waste management facilities/land fill sites.
- Preventing the generation of air pollution during the construction period by water sprinkling of the construction site
- Installing appropriate technology that helps reduce emissions to prevent excessive emission of dusts.



8.2.4 Site landscape

As much as possible, attention must be given to save the indigenous resources found on the site and trees planted nearby area of the project site.

8.2.5 Health and risk management

Health and risk management should be done to avoid unnecessary impact on human health. Providing health facility (protective gears, mobile clinic or first aid service depending on the size of workforce) is the main element of health and risk management.

8.3 Operation phase environmental management plan

Most of project environmental management activities will be carried out during the operation phase, as environmental impact at this stage is so significant (including dust pollution and human health impacts).

The objectives of the environmental management program at this phase of the project are: protection of the environment from water and solid wastes pollutants, protection of workers from work area health hazard, efficient use of ground water source, waste management and improving the environmental performance of the company. The consultant proposes an environmental and Safety Management Unit (ESMU) in the company's structure to operate the environmental management program at this stage of the project.

The unit is responsible:

- Co-ordinate and administrate all aspects of the environmental management programs;
- Develop further environmental oversight capability within the company and
- Facilitate the implementation of companywide environmental Management System (EMS)

Chapter 9. Environmental Monitoring Program

Monitoring a project or a program and its surrounding is a tool for decision making not an end product. Pertaining to Pasta & Macaroni Factory project, the monitoring will involve both quantitative and qualitative data, as appropriate to the nature of the information.

Both due to its significance and comprising different components; the production stage environmental management monitoring and implementation program presented in detail.

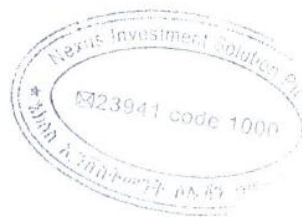
Environmental monitoring is very essential part of the project implementation. It helps to follow up the implementation of the proposed mitigation measures, as they are required and to anticipate possible environmental hazards and/or to detect unpredicted impacts over time.

Such monitoring has to be carried out by the Company's Environmental and Safety Management Unit (ESMU) in a regularly bases. The company top management together with affiliated units on the Oromia Rural Land and Environmental Protection Bureau and representatives of the local community's cabinet should have to carry out an occasional monitoring on the performance of the environmental management play. Random monitoring on selected environmental indicators by ORLEPB also important as it is essential for auditing the environmental protection program of the company.

The ESMU as the central point in monitoring the environmental management plan of the operation phase of the project; the responsibility of the unit will be ensuring the implementation of all the proposed mitigation measures. The unit should focus at least on the following main environmental management plan themes:

Even though the company's establishment is to generate returns to the shareholders and the stakeholders, the company will also be committed to minimize potential negative impacts on the environment & the community. Therefore, Pasta & Macaroni Factory Project is committed to sustainable food processing establishment in the region. To that end, the company will:

- Use the Best Available Technology
- Apply industry best practices in its operations
- Comply with regional, national and international environmental laws & regulations.
- Rehabilitate the environment affected by its activities
- Engage effectively with local communities and work on local environmental conservations and management



- Engage in and recycle treated waste water for economic purposes

9.1 Green Belt Development

Pasta & Macaroni Factory project shall be developing greenbelt inside and outside the premises of the plant. Besides, project site will be covered with trees of local variety that will be planted and reforested.

9.2 Environment Management Unit

Apart from having an EMP, it is also necessary to have a percent organizational set up charged with the task of ensuring its effective implementation. A separate department consisting of officers from various disciplines shall be created to coordinate activates concerned with the management and implementation of the environmental control measures of the proposed plant operation.

Basically, this department shall undertake monitoring of the environmental pollution levels by measuring stack emissions, ambient air quality, water and effluent quality, noise level etc. Departmentally or by appointing external agencies wherever necessary. In case, the monitored results of environmental pollution are found to exceed the allowable values, the environmental management cell shall suggest remedial action and get these suggestions implemented through the concerned plant authorities.

To achieve the objective of pollution control, it is essential not only to provide best pollution control systems but also to provide trained manpower resources to operate the same. Training facilities would be strengthened for environmental control which would cover the items listed below.

- Awareness of pollution control and environmental protection
- Operation and maintenance of pollution control equipment
- Knowledge of norms, regulations and procedures
- Occupational health and safety

9.3 Environmental Liaison Officer (ELO)

The ELO shall be the focal point for all environmental matters in relation to implementation of the engineering component of the proposed project. It shall be the responsibility of ELO to ensure that the design provided for implementation and reviewed is in the EIA/EMP report conforms to those in the conceptual plan. At the end of the review, using relevant checklists, and the design presented for implementation may be approved, referred or rejected if considered environmentally unjustifiable.



9.4 Site Safety and Environmental Manager (SSEM)

The contractor responsible for project execution (construction and commissioning) shall provide a Site Safety & Environmental Manager (SSEM), working in functional interface with the engineering Contractor's Team an interface with the Company's ELO.

Site Safety and environmental Manager will be responsible for the development and implementation of the environmental activities relevant to construction described in the EMP. He will report to the Contractor Site Representative. The SSEM'S environmental responsibilities shall include the following:

- To ensure that all construction personnel involved with construction related activities are aware of the objectives and appropriate environmental requirements.
- To acknowledge the project organization with the environmental policy of the project
- To execute internal environmental auditing
- To carry out site inspections
- To manage the waste streams as described
- To compile and issue documents and reports required to design and run environmental training
- To liaise with construction department and management
- To liaise with sub-contractors
- To plan and carry out, when necessary, studies and/or environmental expertise. The contractor's office will provide qualified resource support as and when required.

9.5 Environmental Management Activities

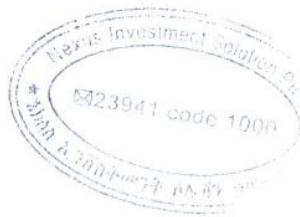
This section presents those procedures and activities of general nature, which need to be implement for conservation of the resources and for protection of environment. These can be grouped under the following headings:

9.5.1 Wastes Management

Waste shall be managed in accordance with the company's Waste management Plan as stipulated in the Pasta & Macaroni Factory Project Environmental Management System and compliance with the country's environmental regulations. The principles of waste reduction, recycling, recovery and reuse shall be practiced.

9.5.2 Waste Minimization Guidelines

Waste minimization implies the reduction of the volume of air, liquid and solid wasters to maximum possible extent. The four priceless of waste minimization process (namely;



Recycling, reduction, reuse and recovery) shall be adopted as applicable. Further, development activates are functions of the activity level, age depreciation and maintenance level of facilitate and operating equipment.

9.5.3 Waste Handling Guidelines

For proper handling and disposal, wastes shall be well defined at source and the definition transmitted along with the waste until the final disposal state. All procedures shall be defined, and documented appropriately for all wastes generated. The general information required, and a minimum, for adequate definition of wastes include:

- Waste stream identification
- Proper was categorization
- Waste segregation
- Appropriate handling and disposal practice

Recommended management practices

9.5.4 Waste Segregation Guidelines

For effective implementation of appropriate waste disposal methods and recycling, it is important that waste material be segregated, preferably at source into clearly designated bins at strategic locations.

9.5.5 Waste Disposal Guidelines

Instructions on the material safety-handling sheet shall be strictly adhere to, and shall form the basis for the disposal of wastes related to such products. Adequate treatment measures shall be undertaken, wherever applicable, for all waste before final disposal.

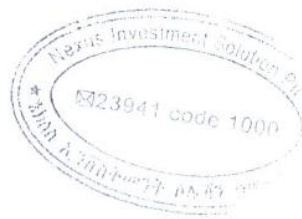
9.5.6 Monitoring

The various areas to be monitored shall be in accordance with the state of the environment. In the light of this, there is a need to establish the monitoring schedule for sustainable development of the project. In-house environmental program needs to be instituted for the project, while external environmental monitoring shall address the foregoing key issues to ensure compliance with good housekeeping and manufacturing practice in order to avoid unnecessary adverse effect.



Table 9.1 Environmental monitoring plan

No	Parameter to be monitored	Mitigation measures (Activity)	Frequency	Institution responsible	Budget birr
1	Solid waste	- Asses foods processing waste and other solid wastes - Recycle/reuse solid waste	Biannual	Proponent, environmentalist regulatory body	50,000
2	Water quality	- Limit ambient water quality test parameter - Conduct quality test - Collect and prevent wastewater from being discharged to ambient area	Biannual	Proponent, environmentalist, health office, regulatory body	100,000
3	Air quality	- Limit ambient air quality test parameter - Conduct air quality assessment - Limit dust emissions to below standards	Yearly once	Proponent, environmentalist, regulatory body	10,000
4	Soil disturbance	- Limit soil disturbance - Reuse removed topsoil for economic and environmental conservation purposes	Once yearly	Proponent, environmentalist, regulatory body	5,000
5	Health hazards and spread of diseases	Assess incidences, status and trends of diseases in the project area, Assess employees health safety and utilization of safety devices	Yearly once	Proponent, environmentalist, health office regulatory body	10,000
				Total environmental monitoring cost	175,000



9.5.7 Capacity building and Training

A training program is an essential part of an Environmental Management System (EMS). Environmental Training will be given to key operators on those who are responsible for informing their teams. In the with the guidelines, Mawel Pasta & Macaroni Factory project shall establish a Health Environment Safety (HSE) Unit, which shall be staffed with qualified shall establish a Health Environment Safety (HSE) Unit, which shall be staffed with qualified and competent scientists/engineers. There shall be a corporate/company HSE manager who shall be responsible for implementing the company's Environmental Policy and ensuring compliance with all relevant international, national and state environmental regulation and laws.

The capacity of the HSE department would be strengthened through institutional strengthening by purchasing portable environmental quality meters for measuring pollutants instantly in air, water and soil as well as measurements of noise and heat. Staff of the HSE will be trained on proficient use of the items of pollution monitoring equipment including understanding and importance of Quality Assurance/Quality Control as well as interpretation of field monitoring data and report writing for compliance monitoring.

There shall be periodic Sustainable Environmental Awareness Training/Seminars with consent including Ecology, Sustainable Development, Environmental Management, Institutional and Regulatory Framework, Pollution Control, Enforcement and Compliance Monitoring, Environment Accounting, Corporate Environmental Responsibility, Environmental Health and Safety, Risk Assessment, Environment Assessment Contingency Plan, Event Response, Liability and Compensation etc. for Managers, Supervisors/Intermediate staff and junior staff to inculcate the tenet of sustainable development in all member of staff. The company allocated 175,000 Eth Birr for the execution of environmental management activities.

9.5.8 Reporting

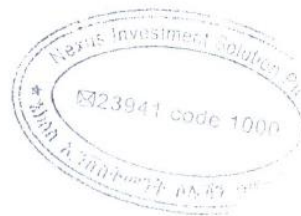
Reporting of all incidents shall be made to the regulatory agencies and supervisory bodies as they occur. The findings of each environmental audit shall also be submitted to Oromia Rural Land and Environmental Protection Bureau.

Environmental Audits are tools used by management to systematically and periodically evaluate the performance of environmental management systems (EMS), procedures and equipment. Environmental audits are required by the company as environmental monitoring tools to ensure that project operation is carried out according to the regulatory requirements and standards.

All the project facilities shall be regularly audited once operation commences. This audit shall check the prediction of the environmental Assessment report and assess the general

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Pasta and Macaroni F a c t o r y P r o j e c t



Performance of the project to ensure that environmental standards are maintained in a Pasta & Macaroni factory project. Policies and environmental management guidelines are strictly maintained. Each environmental audit shall be geared towards achieving the

Following:

- Examine compliance with regulatory requirements,
- Identify current and potential environmental problems,
- Examine the line management systems, plant operations, monitoring practices and data, procedures and plans,
- Check the predictions of the Environmental Evaluation Assessment and ensure that its
- Recommendations are being implemented,
- Recommend areas of improvement in operations management.

9.5.10 Environment labeling and life cycle assessment

Life cycle assessment (LCA) is a method of checking the facts about the environmental burden of a product from its design through to production and then final disposal. It can be used in design of a new product or the evaluation of existing product. EIA is the analysis of a product or service' through all stages of its life cycle, raw material acquisition, manufacturing, transportation; use/reuse/maintenance, recycling/waste management and relevant energy supply systems. It includes:

- Evaluation and policymaking
- Public education
- Internal decision making
- Public disclosure of information

In the same process, product also gets environment labeling. Mawel Pasta & Macaroni Factory project is committed to conduct all types of studies including EIA to preserve the natural resources and to protect the environment.

9. 5.1.1 The Company's Statement on the Project

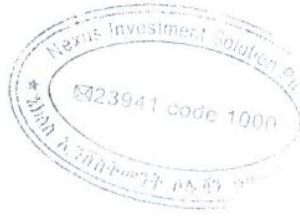
The Pasta & Macaroni Factory project shall adopt up-to-date technology in foods processing industry by which, its impact on environment shall be significantly reduced, and the local government regulations and the global standards would be completely fulfilled. Designed environmental specifications of the proposed plant are in line with or more stringent than national environmental guidelines.

A comprehensive environmental management system will be developed to monitor environment and safety performance. A total engineering concept Performance parameters will be applied. Safety audits shall insure Compliance with health and safety legislate and assessing work place risk

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Culturally proposed project shall have no significant, impact with regard to cultural effects. Economically, the proposed pastry foods processing plant will serve the national encore, will provide job opportunities and a long-term economic boost and will help to supply the high demand processed food in the Ethiopian market:



Chapter-10 Conclusion and Recommendations

10.1 Conclusions

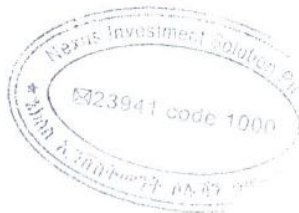
This document generally attempts to show the environmental impacts and controlling measures of the Pasta & Macaroni Factory project to be located at Adama. The Company is expected to follow suggested mitigation measures to control all the impacts associated with the plant project.

The development of network and the provision of electricity, pure water, etc. will have a direct impact on the development of the area. Another major benefit for the community is the provision of employment opportunity for the surrounding community. The adverse environmental impacts associated with the proposed project and which were identified by the assessment conducted are manageable, monitorial and controllable by the proponent.

10.2 Recommendation

Here below few recommendation ware forwarded:

- To enhance the potential economic benefits and social acceptability of the project; it is very important for the company management body and! proponents (a)to avoid or minimize any adverse impacts of the project on human health and, (b)to reduce impacts on the environment,
- It is recommended that the proposed mitigating measures are properly implemented on time.
- To ensure proper implementation of mitigation measures, monitoring and auditing must be conducted.
- In addition, the company should create harmonious relationship between t local communities by holding discussions with local people so as to develop strong ties with them.
- In collaboration with the local government and the affected community, the company should support development efforts in the project site. This will strengthen trust between local people and the company.
- The company must develop its own internal environment policy, environmental management system and comply with federal and regional state environmental regulations and Emission Standards.



Zerayakob Belete

Telephone: Res. : 251-11-4191379, Mob. : 251-911611370

P.O.Box: 23941 code 1000 Addis Ababa, Ethiopia

Email: zerayakob@yahoo.com

Personal Data

Date of Birth : 29/4/1975
Sex : Male
Marital Status : Single
Nationality : Ethiopian

Career Objective

effective and efficient and do tasks professionally. Execute ethically with full concentration and capacity I have.

Summary of Qualification

Msc. Eng. MBA cand. (UK)

Professional Experience

October 01, 2007 - present **General Manager, Nexus Investment Solution PLC**
- Project feasibility studies, Business Plan preparation, Environmental Impact Assessment, commission agency, erection & commissioning , ASSET AND BUSINESS VALUATION

2008 - June 30/2011 **Investment Advisor, Access Capital Services S.C**

2006 - Sept. 2007

Business Development expert

Star Business Group PLC(STAR GROUP CORPORATE OFFICE)

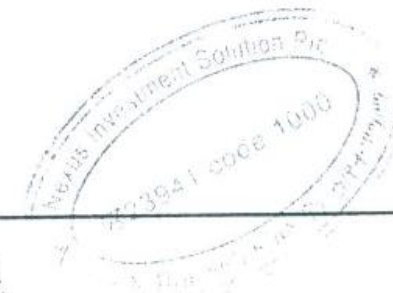
Major Duties & Responsibilities

- Conducting Feasibility studies
- Asset valuation
- Preparations of project profiles
- Preparations of business plan
- Management of projects
- Negotiations & contracting etc.

1999-April 2006

Team leader

Ethiopian Science & Technology Commission



Organization Type: Government - Federal

Major Duties & Responsibilities

- Research Project evaluation, monitoring and follow-ups.
- technology transfer and development
- Evaluation of appropriate energy technologies
- Dissemination of appropriate technologies to end users
- Promoting useful indigenous technologies
- Technical evaluation of adopted, incremented technologies on energy and water
- Giving Support to respective Regional bureaus
- Follow-up and evaluation of projects supported by International Atomic energy Agency (IAEA)
- Follow-up and evaluation of projects supported by Swedish Agency (SIDA/SAREC).

1994- 2/1999

**Process Engineer
Finchaa Sugar Factory**

Organization Type: Government

Major Duties & Responsibilities

- Factory Erection & Supervision,
- Plant Commissioning
- As process engineer during the first year of sugar production
- Operators Training etc

ng

2003 - Jul 18, 2003

project management,evaluation &monitoring

Bradford University

The training concentrates on Project planning,impementation,monitoring and evaluation. It was given by Bradford university staffs

ages

- Amharic (Ethiopian)
- English

Oral Level

Excellent
Excelllent

Written Level

Excellent
Excellent

Professional Membership Association

Organization : Ethiopian Society of mechanical engineers
Member Since : Oct 20, 2000
member



References

Asrat Bulbula

Consultant

Proc

Phone: 565322

Email: asrat@yahoo.com

Mesfaye Dama

Teacher

Addis Ababa University

Phone: 232433

Email: technorth.aau@telecom.net.et

Tebebe Belachew

Managing Director

Telecom Engineering PLC

Phone: 09119210345

Email: tbaeng@telecom.net.et



CURRICULUM VITAE

NAME: GETISH TEKLE
DATE OF BIRTH: 14th DECEMBER 1970
PLACE OF BIRTH: ADDIS ABABA, ETHIOPIA
NATIONALITY: ETHIOPIAN
MARTIAL STATUS: MARRIED
CONTACT ADDRESS: RESIDENCE: P.O.BOX 33694, Addis Ababa, Ethiopia
Tel. +251-116 476485 Res., +251-911-123415 Mob.
E-mail - getishtekle @ yahoo.com

EDUCATIONAL BACKGROUND

UNIVERSITY EDUCATION

1987/88 - 199/92: B.Sc. in Chemical Engineering from Addis Ababa University.
2000-2001 : Advanced post graduate level certificate in Environmental Management
and Cost Minimization in Industry from Germany
2006-2008 : M.Sc in Environmental Management and Policy from Sweden

HIGH SCHOOL EDUCATION

1983/84 - 1986/87: Kokebe Tsebah Secondary School

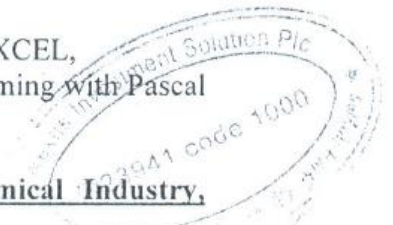
OTHER PROFESSIONAL TRAINING

March - June, 1996: In Italy
Training: - Safety and Environmental protection
- Waste disposal and treatment
- Plant Maintenance
- Pesticide Safety
- Pesticide formulation
- Project Management

December, 1995: Ethiopian Management Institute
Training: - Industrial Production.

March-June 1997: Y & Y Computer Center
Training: - Computer Software:- MS-DOS,WORD,EXCEL,
LOTUS1-2-3, power point, and Programming with Pascal
and Fortran.

September, 1999 and: Tianjin Bohai Import & Export Chemical Industry,
China



March, 2000

Training:

- Wetable Powder Pesticide Formulation Technology
- Pollution Prevention
- Cleaner production
- Management of Hazardous Chemicals
- Project Evaluation and Supervising
- Installation of WP Plant Machinery

August, 2000 - July 2001, In Fed. Rep. of Germany

Training Title: **Industrial Environmental Management and Cost Minimization in Industry**

Certificate received: Advanced Professional Training Certificate, Environmental Auditor Certificate, International Management Certificate and Practical Training Certificate

Study Programs:

- Environmental Protection Integrated in Industrial Production
- Environmental Management (ISO 14001 and EMAS).
- Methods of Processes for Environmental audits
- Motivation and Communication of operational Environmental Protection.
- Global Environmental Management system and policy
- Environmental Management and Budget Management
- Industrial Environmental Protection Technology
- Environmental Cost Management
- Environmental Information Systems
- Quality Management (ISO 9001:2000)
- Production Management
- Safe Disposal of Hazardous Waste
- Occupational health and safety
- Integration and development of Environmental and Quality Management System.
- Leadership Skills
- Change Management
- Innovation Management
- Environmental Auditing (ISO 14010-12)

October 1-November 27, 2001: Web based training by CDG,Germany

Title of the Training:

Consultancy as a professional option

- Consulting
- Consulting approaches
- team projects
- business development
- self evaluation

April 8-9/2002

: Red Cross training Center

Title of the Training

: **Performance Appraisal**

- Appraisal concepts
- Performance appraisal solutions

July 23-Oct. 1/2004:

EUROPE: Organization for the Prohibition of Chemical Weapons(OPCW)

Title of the Training

: **Associate Program**

- an overview of the chemical weapons convention (CWC) in Netherlands
- **advanced training in Engineering at the University of Surrey, United Kingdom**
 - Chemical process technology
 - Health, Safety and the environment including quantitative Risk assessment (QRA), Control of Substances hazardous to Health (COSSH), Hazard and Operability Study (HAZOP)
 - Leadership and teamwork
 - Communication
 - Problem-Solving techniques
 - Operating and managing practically a pilot chemical plant
- **Internship and training at Clariant Industrial facility in Switzerland**
 - Research work on "Reliability and Identity check improvement of Fourier-Transformation Near Infrared (FT-NIR) spectrometry.
- Presentation on the findings of research topics, both the industrial and regarding "Technology available for the abatement of Volatile Organic Compound (VOCs) and their disposal, in Netherland

March 7-11,2005:

Pretoria, South Africa

Title of the Training:

Regional assistance and Protection against chemical Weapons

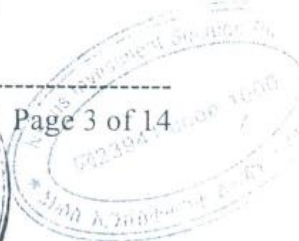
Details Of the Training:

- Article X of the Chemical Weapons Convention
- Chemical-Warfare agents
- Toxic Industrial Chemicals
- Assessing threats and recognizing attacks
- Individual protection

Curriculum Vitae: Getish Tekle



Page 3 of 14



- Decontamination (Personnel, Casualties and Equipment)
- Incident scenarios and possible Consequences
- Response planning
- incident management
- Emergency-response

October 19-December 18, 2009: Web based training by INWENT, Germany

Title of the Training;

Result Oriented Monitoring-RoM

- Introduction in Results-based Management (RBM)
- Purpose of Monitoring in a RBM environment
- Six steps to Results-oriented Monitoring (RoM)
- Development of results chains and indicators
- Practical exercises and tutorial guidance to develop a RoM approach
- Developing a results chain, defining indicators, setting up a monitoring plan, and designing data collection forms and procedure

June 15-July 04, 2009: Nanjing Agricultural University, China

Title of the Training;

Seminar on China's Development zone policies

- types of development zones
- rules for implementation of regulations of development zones
- management models for development zones
- development zones and their roles in economic development
- industrial park
- enterprises in the zone

PROFESSIONAL EXPERIENCE

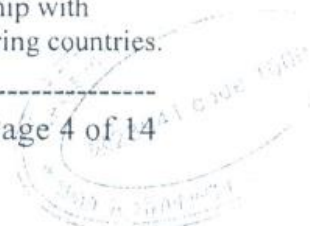
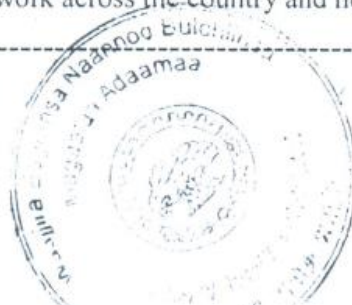
November 2010-Todate

Organization : Kality Food Share Company

Job title : Chief Executive Officer (CEO)

Main duties and responsibilities:

Main tasks are overall strategic leadership of the company and sets the direction of the company. It includes which markets will the company enter? Against which competitors? With what product lines? How will the company differentiate itself? I also sets budgets, forms partnerships, and hires a team to steer the company accordingly. The other area of accomplishments are building culture and building teams. Analyzing value chain, SWOT analysis and defining strategic direction. Forms cooperation and partnership with stakeholders and forming market network across the country and neighboring countries.



November 2009-October, 2010

Organization : Textile Industry Development Institute, Ministry of Trade and Industry

Job title : Engineering Service Directorate, Director

Main duties and responsibilities:

1. Provide technical supports and consultancy services for existing as well as potential investors in the textile and garment industry to meet national and international standards
2. Identification of sources of information related to policy-driven issues, identification and synthesis of best practices and lessons learnt to formulate conducive country policy for the sector
3. Strengthening partnerships with donors to effectively implement capacity building program of private sector development
4. Advice and support industries to implement energy efficiency and resource efficiency programs to upgrade their operational efficiency to enable them operate sustainable
5. Support and monitor industries to meet environmental regulations
6. Advice and support industries to reduce effluent systems to reduce their environmental burden
7. Study and advice government on ways to integrate environmental consideration on industries
8. Conduct studies which enhance the development of the Textile and apparel industry, draw up short, medium and long term development plans and implementation schedules
9. Study benchmarks with respect to energy and water utilization and disseminate the results to users and make policy proposals
10. Collect, analyze, and compile information which is relevant to the development of the industry and disseminate the same to users
11. Establish information linkage systems among support providers and support seekers in the industry and create conducive situations for the smooth flow of such information
12. Receive relevant service seekers applications in order to directly handle the matter or cause to be handled by others, depending on the nature of the application
13. Extend supports to those public and private development forces which are engaged or wish to engage in the industry in order to strengthen their alliance and cooperation
14. Undertake , coordinate and administer the sector's Public and Private Partnership forum

15. Undertake plan, implementation, evaluation and prepare report of the same

PROFESSIONAL EXPERIENCE

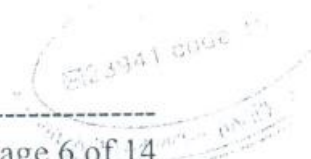
August 2008-November 2009

**Organization : Textile and Leather Industry Development Center, under
Ministry of Trade and Industry**

Job title :Head, Textile and Apparel Industry Development Department

Main duties and responsibilities:

1. Provide technical supports and consultancy services for existing as well as potential investors in the textile and garment industry, in order to make them successful.
2. Create and coordinate conducive atmosphere for developing production and marketing linkages among the stakeholders who are involved in the supply chain of the sector and strengthen the linkages
3. Conduct studies which enhance the development of the Textile and apparel industry, draw up short, medium and long term development plans and implementation schedules
4. Undertake market research in the industry, develop strategies and systems to implement the market study and disseminate the results to users and make policy proposals
5. Collect, analyze, and compile information which is relevant to the development of the industry and disseminate the same to users
6. Establish information linkage systems among support providers and support seekers in the industry and create conducive situations for the smooth flow of such information
7. Receive relevant service seekers applications in order to directly handle the matter or cause to be handled by others, depending on the nature of the application
8. Extend supports to those public and private development forces which are engaged or wish to engage in the industry in order to strengthen their alliance and cooperation
9. Undertake , coordinate and administer the sector's Public and Private Partnership forum
10. Undertake plan, implementation, evaluation and prepare report of the same



March 2006-To June 2007

Organization : East African Group Sh. Co - Chemical Industry
Job title : General Manager –Soap and Detergent Factory

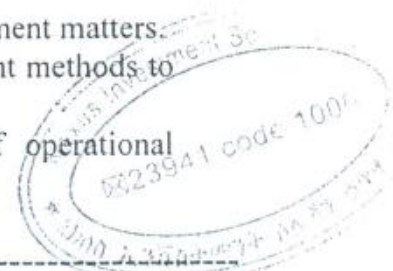
Job - Summary

The role involves planning, developing and implementing strategies for operation management and development in all areas of the chemical Industry (Soap and Detergent Factory) so as to meet performance plans with in set budgets and timescale. Particularly, the following main duties are performed:-

Plans, organize, coordinate, lead and control the overall activities of the industry. Develop short and long term strategies, sees the timely preparation and proper execution of the budget and work plan; prepares policies and directives, ensure the proper implementation of policies, procedures, rules and regulations, follows the financial position of the company and ensure health as well as the availability of adequate working capital; realizes the efficient, effective and economic use of resources. Provides analytical, strategic, and managerial decision on problems and follow the proper staffing of positions and proper placement of employees. Controls the whole activities of the company and enters in to agreement representing the company.

Detailed Duties and Responsibilities

1. Provide strategic leadership with vision to the company management, organization structure, growth, and to ensuring maximum profit and return on investment.
2. Ensure company sales target are set and achieved.
3. Liaise with departmental managers to achieve operational objectives & purposes.
4. Monitor, measure and report on all operational and development issues.
5. Manage & control departmental expenditures.
6. Liaise with SBU'S and manage the industries employment matters.
7. Stay well informed of and introduce new development methods to maintain company's position at top end of the market.
8. Contribute to the evaluation and development of operational strategy.



9. Ensure quality management, health and safety, legal and environmental standards are met through out the industry.
10. Lead the factory team in development activities with a view of improving product quality and introduction of new products in to market,
11. Ascertain that all expenses are executed in line with the approved budget.
12. Coordinating production resources and demand.
13. Managing material, & inventories.
14. Scheduling personnel, equipment & work.
15. Represent the industry on meetings, negotiations symposiums, conferences, seminars etc.
16. Promoting policies and objectives to increase awareness, motivation and involvement of workers in the industry.
17. Review & analyze available information for the betterment of the overall operation.
18. Prepare and submit periodicals reports.
19. Observes the proper staffing of positions and placement of the workforce.
20. Reviews and takes rectification action on auditor's reports.
21. Takes disciplinary measures on misdemeanors in line with the policies and procedures of the organization.
22. Allocates responsibilities to management staff of the factory and continuously appraise their performance against set targets.
23. Ensure that the company's property is protected against all risks.
24. Review benefit packages of employees and come up with various suggestions.
25. Proposes annual salary increments and bonuses.
26. Implements the salary raises and bonuses and other benefits when approved.
27. Performs other related duties as may be assigned by superior.

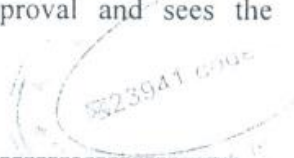
005-To March 2006

EAST AFRICAN GROUP (ETH.) PLC

POSITION: **Deputy General Manager- Soap and Detergent Factory**

ES

- Planning, organizing, coordinating, leading and controlling all over activities related to production, human resources and financial management of the chemical industry (Soap and Detergent factory).
- Designs the short and long term strategic plan of the company and forwards for the approval and sees the implementation of the plan.



- Commit the workforce to exceptional standards for performance, productivity and work towards sustainable and profitable growth of the business unit.
- Sees the timely preparation of the budget and work plan of the industry and approval of the same by the Directors.
- Follow up the execution of the budget and work plans and ensures the performance of the units as per plan and budget.
- Circulate rules and regulations that do not violate the corporate policies to workers under the industry.
- Be custodian of all the factory operations, regulations and individual code of conduct.
- Lead the factory team in development activities with a view of improving product quality and introduction of new products in to the market.
- Study's and implements system that could help to boost productivity.
- Represent the industry on meetings, negotiations, symposiums, conferences, seminars etc. in approval with the corporate management
- Presents periodical activity reports
- Ascertain that all expenses are executed in line with the approved budget

2003-June2005

ADAMITULU PESTICIDES PROCESSING SHARE COMPANY

POSITION: **RESEARCH AND DEVELOPMENT SERVICE HEAD**

IES

- Planning, Coordinating, controlling and Leading the service
- Coordinate feasibility study in developing environmentally friendly products.
- work with management group to formulate strategic business plan and annual plan
- prepare and develop program's of implementation and monitor results
- Conduct necessary research (market. technology) activities to diversify products
- Develop sound waste management system
- Lead the activities of total quality management
- Develop safety and training manuals
- Train employees on new scientific findings and about SHE
- Assign work to research personnel to conduct research on both the development of new products and/or improvements in quality, application, storage...etc on the existing ones.
- Evaluates the out put of researchers

- Facilitate the work of researchers through creating ideal research facilities and administrative supports.
- Updates the work unit with recent developments on pesticides market and product developments.
- Follow-up the national and international trends on the production and marketing of pesticides and advises management to take appropriate action as required.
- Design and follow up of emergency preparedness and actions
- Risk analysis and prevention system design
- prepare and submit performance reports

December, 1997 –July 2003

AT: ADAMITULU PESTICIDES PROCESSING SHARE COMPANY

POSITION: **PRODUCTION AND TECHNIC DEP'T MANAGER.**

DUTIES

- Plan, coordinate, control and manage the dep't
- Preparation, evaluation and awarding of bids
- Staff selection, training evaluation and promotion
- Upgrade safety, health and environment operating level of the factory
- coordinate environmental impact assessment and improvement activities
- Coordinating production of technical information about products
- Preparation and implementation of department's budget
- Preparation of manuals
- Preparation of specifications of machinery, equipment and raw materials for purchase
- Preparation of contracts for machinery and equipment purchase
- Working on safe management of pesticides
- Coordinating the effort of establishing an environmental management system with in the plant
- Providing the staff with technical support to ensure effective operation
- Promoting policies and objectives to increase awareness, motivation and involvement of workers in the organization
- Identify the processes needed for quality and environmental systems and their implementation throughout the organization
- Served frequently as general manager through delegation

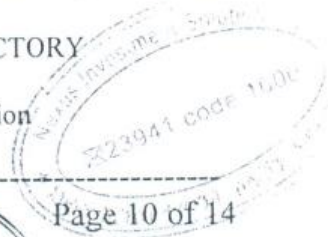
NOVEMBER 1997 - December 1997,

AT: ADAMITULU PESTICIDES FORMULATION FACTORY

Position: **Production Division Head**

Duties: - Plan, Coordinate, Control and Lead the Division

Curriculum Vitae: Getish Tekle



- Study and substitute Imported Raw materials by Locally Available ones.
- Specialize, Simplify and standardize products
- Prepare safety rules and regulations
- Implement safety and environmental policies
- Design and implement standard pesticide packages
- Train workers
- Prepare production division budget and training needs.
- Work closely with other departments to satisfy customer needs
- Identifying and managing risks, and exploiting improvement opportunities
- Conducting data analyses to facilitate improvement of production processes.
- Ensuring the availability of resources needed by the division.

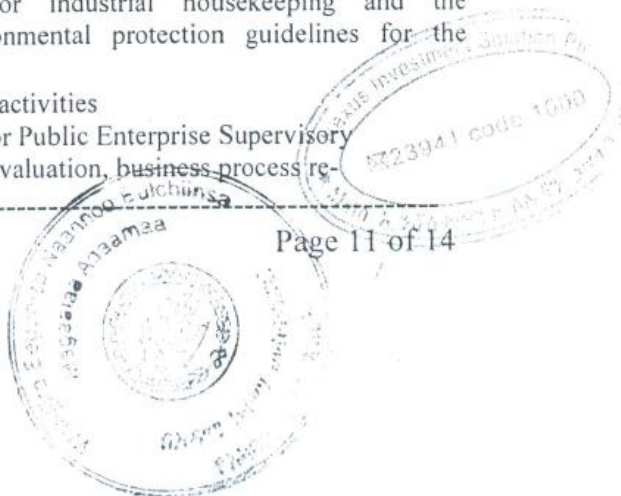
August 1992 - NOVEMBER 1997

AT: AGRICULTURAL PESTICIDES FORMULATION PROJECT
 POSITION: Project Engineer

- DUTIES:
- Erection and supervision of project works
 - Project progress evaluation of plant machinery erection
 - Evaluation and approval of Technical proposals
 - Amendment of contracts
 - Preparation, Evaluation and Awarding of bids for plant machinery and equipment.
 - Modify and Install Plant Machinery.
 - Report the status of the project

OTHER PROFESSIONAL ACCOMPLISHMENTS

- Work as national consultant for UNIDO and accomplished:
 - Identification of environmental working parameters and their comparison with international values for the formulation plant.
 - Asses deviations against the identified national and international norms and values and suggest recommendations.
 - Suggest a system that will bring a total quality management to the formulation plant.
 - Develop a scheme for industrial housekeeping and the establishment of environmental protection guidelines for the pesticide Plant.
 - Carrying out monitoring activities
- Render professional service for Public Enterprise Supervisory Authority regarding project evaluation, business process re-



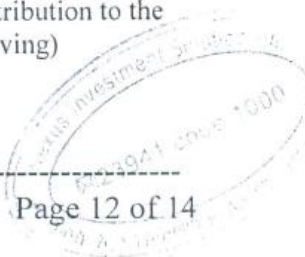
- engineering, draft regulation preparation regarding joint venture, management contract and lease.
- conduct asset valuation for Repi Soap and detergent plant
- Give lecture as part time instructor for Msc and undergraduate students at Ambo University and Addis Ababa University respectively.
- Work as part time instructor for Msc Environmental students at Addis Ababa University
- Worked as Environmental Economist and Engineer consultant for the study of Environmental and Social Impact assessment of coal mining, thermal power plant and coal phosphate project complex,
- Participated in the manpower and organizational structure consultancy of Alkid Resin Share companyof
- Rendered training for benchmarking implementation for Textile factories

Paper Produced

- Research Proposal paper on the persistence characteristics of Organochlorine insecticide (DDT) under Ethiopian Environmental Condition.
- Study paper on the necessity of constructing a Pesticide Formulation Factory in Ethiopia.
- Study work on disposal system and Facility of Hazardous Chemicals
- Preparation of Manuals on Industrial Hygiene and safety
- Feasibility study of the necessity of Diatomite pretreatment plant worth of Birr 5,000,000.
- Feasibility study of production of water Dispersible powder (WDP) Insecticides worth of Birr 3,000,000.
- Paper on Environmental Impact Assessment of the Adamitulu Pesticide Processing Operation.
- Guidelines for environmental working parameters and standards
- Project proposal on the establishment of pyrethrin extraction plant
- Municipal Waste management of the city of Minisk, Belarus
- EU-Emission Trading scheme, Economic Instrument
- Thesis paper on local production and use of bio-ethanol for transport in Ethiopia

Major Achievements

- Developed a system on pesticide batch production sequence so that contamination and wastage of materials reduced thereby achieved 12% reduction of cost of production
- Work as team leader to study and prepare feasibility study on dust pesticide raw-material treatment facility where its implementation has avoided importing fillers and made a significant contribution to the factory's value adding operation (about 27 % cost saving)



- Work as a team leader to standardize pesticide product formulation and accordingly select good manufacturers for the supply of raw-materials suitable for the formulation. By doing so and entered into long term contract, quality of product enhanced and remained consistent at the same time cost is educed by 8% from earlier period.
- Work as team leader to prepare a feasibility study on the expansion of the pesticide production unit. Leading the team on its implementation made the production capacity to increase by 65% and generates 50% of the factory annual turnover.
- By introducing appropriate preventive maintenance, down time as a result of lack of spare-parts and planned maintenance in the pesticide, maintenance cost has reduced by 23%.
- Work as a team leader to develop one new insecticide to use in Veterinary sector for mitigation of animal ecto-parasite.
- By introducing a direct soap packing method, scrap recycling has reduced by 17% and increased production capacity by 19%.
- By putting in place preventive maintenance system in the soap and detergent factory, cost of maintenance has reduced by 50%
- By applying hazard operability study and putting in place suitable preventive mechanisms, working area in the soap and detergent factory accidents have reduced by 11%.

LANGUAGE ABILITY

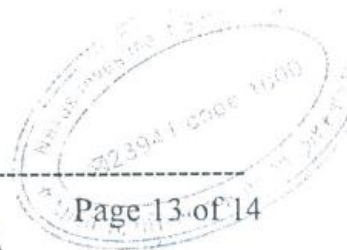
- English, little German, Amharic and Little Italian.

OTHERS

- Hold 2nd Grade Driving License
- Member and Active participant of Ethiopian Chemical Engineers Society.

REFERENCES

1. **ATO Girum Bahri**
PROJECT MANAGER
GTZ CENTER FOR COOPERTION WITH THE PRIVATE SECTOR, PPP
TEL: +27 (0) 12 423 6340
Cell: + 27 (0) 82 882 0887
E-mail : CCPS. Bahri@gtz.de
Pretoria, South Africa

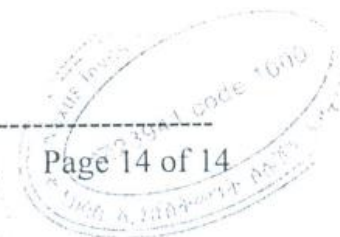


2 **Prof. Don Huisingh**

RETIRED SENIOR SCIENTIST IN SUSTAINABLE DEVELOPMENT
& EDITOR-IN -CHIEF OF THE
JOURNAL OF CLEANER PRODUCTION
INSTITUTE FOR A SECURE AND SUSTAINABLE ENVIRONMENT
UNIVERSITY OF TENNESSEE
311 CONFERENCE CENTER BUILDING
KNOXVILLE, TN 37996-4134, U.S.A.

3- **Zebene Kifle (PhD)**

Head, Chemical Engineering Department
TEL: +251 11 1232417
Mob: +251 91 2167618
FAX: + 251 11 1239480
E-MAIL: kifliez@cheng.aau.edu.et



Curriculum Vitae

Deshu Mamo Mekuria

A. Name and Address

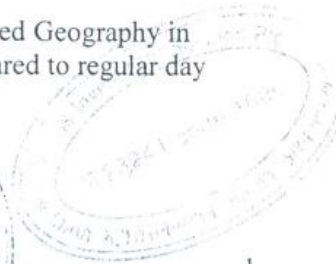
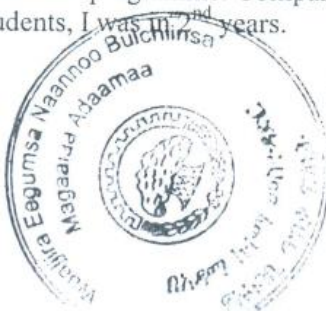
Deshu Mamo Mekuria
Addis Ababa,
P. O. B. 2490.
Tel: 0911- 671909
Addis Ababa, Ethiopia.

B. Personal Information

Date of Birth	June 29, 1970 G.C.
Sex	male
Health	Excellent
Marital Status	Married
Nationality	Ethiopian
Profession	Forester and Environmentalist.

C. Educational Background

Sept.22 - Dec. 2007	Maastricht School of Management (Netherlands), graduated with Post Graduate Diploma in Environmental Management: Towards Sustainable Development.
2002/2003-2003/2004	Addis Ababa University, graduated with M. Sc. in Environmental Science on July 24, 2004.
1991/1992-1993/1994	Alemaya Agricultural University, graduated with B.Sc. degree in Forestry on March 1994.
1989/1990-1990/1991	Addis Ababa University studied Geography in extension programme. Compared to regular day students, I was in 2 nd years.



1985-1987

Wondo Genet Forestry Resource Institute,
graduated with **Diploma in Forestry** on July 1987.

D. Professional Experience

March 2006 -to present

Environmental Development and Protection Team Leader at the Ethiopian Science and Technology Agency.

► Responsible for overall management of research projects in the areas of environmental development and protection, natural resources conservation and sustainable utilization, etc.

May2000-Feb.2006

Environmental Development and Protection Senior Expert at the Ethiopian Science and Technology Agency.

► Responsible for Evaluation and follow up of research projects in the areas of environmental pollution, Environmental development, natural resources conservation, management and protection, soil and water conservation, utilization of natural resources, etc.

July1998-April 2000

Head of Processing Division- in Shashamene Forest Industry Enterprise.

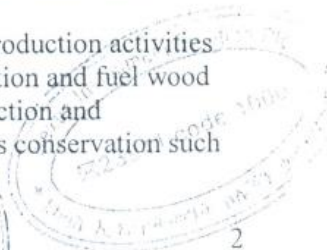
► Responsible for: all types of forest products produced in the enterprise; and eco-tourism at Bishan-Gari Nature Reserve Forest; wildlife management in natural forest, soil and water conservation; extension for local communities; forest road maintenance and constructions, and operation of mobile sawmills.

► Acting for the enterprise manager.

June1997-June 1998

Acting Head of Utilization and Engineering Main Division- in Munessa Shashamene State Forest Development and Utilization Project.

► Coordinating all the forest production activities such as: logs, lumber, construction and fuel wood production; forest road construction and maintenance; natural resources conservation such



April 1995-June 1997

Branch Manager- in Munessa Shashamene State Forest Development and Utilization Project.

► Manage and coordinate forest management activities undertaken at the branch level. These include: silvicultural activities; nursery activities, planting, weeding, pruning, thinning and harvesting; protection of forest and wildlife found in the natural forest and nature reserve, soil and water conservation; eco-tourism and wildlife hunting, and forest extension for local peoples.

► Administration of permanent and temporary workers.

Sept.1994-March 1995

Junior Utilization Expert- in Munessa Shashamene State Forest Development and Utilization Project.

► Control and supervise daily productions of lumbers, poles, construction wood, fuel wood, logs, etc; road construction and maintenance; conservation activities, and prepare weekly and monthly reports.

May1994-Sept.1994

Junior Researcher- in Wood Utilization and Research Center (WUARC).

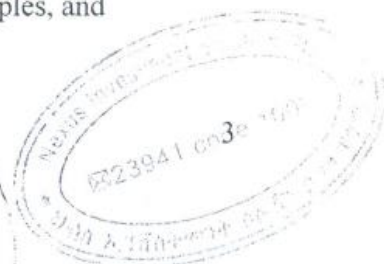
► Conducting experiment on different species of trees to determine the strength and other properties of wood such as: hardness, compression, static bending, elasticity, modulus of impact, etc. and recommend for appropriate end-uses.

► Organize research data and results, and prepare research papers and reports for publication.

July1987-Dec.1991

Junior Expert at (WUARC).

► Assessing different tree species grown in different parts of the country and select trees used for lab. experiment, preparing wood samples, and



I. Language

- I can speak, read and write Amharic, Oromiffa, and English.

J. References

1. Ato Getachew Desalgn
Wood Utilization And Research Center(WUARC)
P.O. Box 2322, Tel: 42 36 88, A.A.
2. Dr. Seyoum Leta
Addis Ababa University (Environmental
Programme), P.O. Box 1176, Tel: 239471,A.A.
3. Ato Tekleargay Jiranne
SOS Sahel, P.O. Box 170, Tel:06-450038 (office)
Negele Borena.



CURRICULUM VITAE (CV)

I. PERSONAL DETAILS

Full name Habtamu Desalegn Terega
Date of birth May 4, 1984
Sex Male
Marital Status Single
Nationality Ethiopian
Contact Address +251-911-85 37 77

II. EDUCATIONAL BACK BROUND

Name of School	Period (in E.C.)	Remark
Dil-Betigil Elementary School	1990/91-1995/96	Completion of Elementary
Yirgacheffe Junior and Senior Secondary School	1996/97-2000/01	Up to grade 11
Yirgalem Comprehensive Secondary school	2001/02	Certificate for completion of high school
Mekelle University	2002/03-2005/06	BA Degree in Economics

III. WORK EXPERIENCE

I have the following work experiences at various departments of Development Bank of Ethiopia

Position	Period	Duties & Responsibilities
Jr. Project Appraisal Officer	Oct. 25, 2006 to August 8, 2008	<ul style="list-style-type: none"> Reviewing and checking the customer due diligence assessment Collecting information on market, technical and financial parameters for the project appraisal Appraising the viability of the project in terms of market, technical, management, socio economic and financial aspects including the environmental soundness
Jr. Risk Management Officer	August 9, 2008 to Jan. 2009	<ul style="list-style-type: none"> Review & Analysis of portfolio of the Bank Undertaking of pre and post credit risk analysis of projects Compilation of various risk related



HABTAMU DESALEGN
CURRICULUM VITAE

			reports of the Bank
3	Jr. Loan Officer	Jan. 2009 to July 2009	<ul style="list-style-type: none"> • Undertaking due diligence assessment of customers • Monitoring and evaluation of projects financed by the Bank
4	Loan Officer	July 2009 to August 2010	<ul style="list-style-type: none"> • Undertaking due diligence assessment of customers • Monitoring and evaluation of projects financed by the Bank • Inspection on the progress of projects financed by the Bank • Extending technical advice to the clients • Preparing various proposals such as rescheduling, additional loan proposal
5	Project Rehabilitation Officer	August 2010 to January 2011	<ul style="list-style-type: none"> • Preparing loan rehabilitation and recovery proposal • Follow up on the improvement of sick projects financed by the Bank • Extending technical advice to the clients
6	Project Analyst	February 2011 to Present	<ul style="list-style-type: none"> • Feasibility Study of Dairy Farm for Helen Agro Processing PLC • Feasibility Study of Livestock Rearing for Kormaba Farms PLC • And many others

IV. SHORT TERM TRAININGS

S/N	Type of Training	Period	Trainer
1	Project Planning and Appraisal	June 11-15, 2007	Development Bank of Ethiopia
2	Planning, Budgeting, Monitoring and Evaluation	June 21-22, 2007	Development Bank of Ethiopia
3	Credit Analysis and Processing	January 08-25, 2008	Ethiopian Banking and Finance Institute
4	Financial Analysis, Business Plan Analysis, Credit Management, Project Finance Analysis and Credit Risk Management	12 days	European Investment Bank and Belgian Bankers Academy
5	Advanced Bank Management Certification Programme	Sept. 13-17, 2010	Belgian Bankers Academy and Portuguese Bankers Training institute in Portugal, Lisbon



HABTAMU DESALEGN
CURRICULUM VITAE

V. CAREER OBJECTIVE

I aspire to further my career by having much expertise and experience in the financial sector, especially in the area of credit and investment analysis.

VI. HOBBIES

- Watching movies
- Reading books
- Participating in voluntary service activities
- Watching various sporting activities
- Swimming

VII. REFERENCES

Mr. Zereyakob Belete:

Nexus Investment Solution PLC, Manager

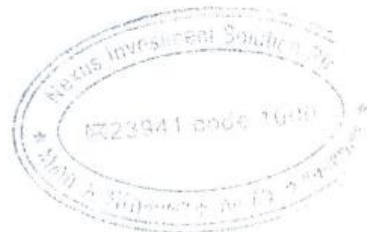
Cell Phone- 251 911 61 13 70

E-mail: nexus.inv@gmail.com

Mr. Gezahegn Mitike

Vice President Credit Appraisal, Development Bank of Ethiopia

Cell Phone- 251 911 25 23 22





የኢትዮጵያ ፌዴራላዊ ዲሞክራሲያዊ ሪፐብሊክ
የአካባቢ ጥበቃ ሰልጠና ሰጪ ሚኒስቴር
 Federal Democratic Republic of Ethiopia
ENVIRONMENTAL PROTECTION AUTHORITY

ቀን **11** MAR 2012
 Date

ቁጥር **11/1.1/1071**
 Ref. No.

To Whom It May Concern

Through a letter dated February 27, 2012, Mr. Zerayakob Belete has requested our organization to issue him a certificate of professional competence in environmental management and protection.

The Environmental Protection Authority of the Federal Democratic Republic of Ethiopia certifies that Mr. Zerayakob Belete is competent enough to carry out consultancy services on environmental management and protection; and this letter is valid only for one year starting from January 29, 2012.

Director
 Environmental Education
 and Directorate

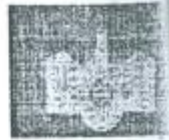


Director General
 Environmental Protection Authority
 Addis Ababa





በአዲስ አበባ ከተማ አስተዳደር
ንግድና ኢንዱስትሪ ልማት ቢሮ
City Government of Addis Ababa
Trade and Industrial Development Bureau



ሰሪ ቁ. N፤ 380470



የገንዘብ ቁጥር: 04/01263/000
የንግድ ልማት ቁጥር: 04/02/241919/03
ፈቃድ የተሰጠበት ቀን: 05/16/2003

1. ስም አካባቢ አገልግሎት ሰጪ ኃይታዎን/ማህበር ዘግብት
2. ስራ አካባቢ አገልግሎት ሰጪ ደንበኛ አድራሻ
3. ማዕከል ስም/ስነ
4. አገልግሎት አይነት
5. የገንዘብ ስልጠና
የገንዘብ ስልጠና ስም
የገንዘብ ስልጠና የሚሰጠው የገንዘብ አይነት
6. የገንዘብ ስልጠና የገንዘብ ስልጠና



2004/01/01	2004/01/01	2004/01/01	2004/01/01





FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
 MINISTRY OF REVENUE
 FEDERAL INLAND REVENUE AUTHORITY



Taxpayer Registration Certificate

NEXUS INVESTMENT SOLUTION P.L.C.

Name of Business/Individual

REGION : ADDIS ABABA CITY GOVERNMENT
 CITY : ADDIS ABABA
 ZONE : KIRKOS KIFLE KETEMA
 WOREDA : NO WOREDA-142
 KFRFIF : 02
 HOUSE NO : 676/05
 FARMERS ASSOCIATION :

Registered Address

0004055927

Taxpayer Identification Number

Professional, Scientific and Techni - ARCHITECTURAL, ENGINEERING AND RELATED SERVICES

Nature of Business

FIRA - ADDIS ABABA MAIN BRANCH

Issuing Authority

2007/11/12
 Date of Issue

This certificate represents the sole and only registration as a taxpayer and supersedes all prior registration documentation.

The taxpayer is responsible for notifying the appropriate Tax Office of any change to the above information.

