

# Environmental and Social Impact Assessment Report of Feed Mill Production Plant, Ethio-Chicken PLC, Burayu Town Administration, May, 2017, Addis Ababa, Ethiopia



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## Abstract

This report presents a detailed Environmental and Social Impact Assessment (ESIA) study for Ethio-Chicken PLC, Feed Mill Production Plant located in Burayu town, Finfine Zuria Oromiya special zone. Ethiopia, as a country of a growing economy, sustainable development can't be ensured with the efforts of the government alone. Thus, to bring sustainable development, the participation of all stake holders including the private sectors is critically important. From different private companies, Ethio-Chicken Poultry PLC is one of the private companies involved in the developmental activity engaged in a poultry and Feed Mill production across the country. The Feed Mill Plant produces Feed Mill for chickens, and uses the product for its own use and supply to national market particularly to farmers with affordable price. However, the process of Feed Mill production obviously has an impact on the environment like other developmental projects. Therefore, this plant is handed in a way to minimize the negative impacts during its production and operational processes. In view of this, the Environmental and Social Impact Assessment (ESIA) report is prepared in line with the EIA requirements stipulated in the EIA proclamations of the government of the federal Democratic Republic of Ethiopia, proclamation No. 299/2002.

The basic objective of the ESIA study is to identify, predict and analyze the magnitude of environmental impacts and propose mitigation and enhancement measures for significant environmental and social effects that arises from the various activities of the Feed Mill production plant. The main approaches and methodologies were followed project screening, review of relevant previous studies, polices and legal frameworks, project area field observations, consultations with relevant stakeholders, describing the physical, biological and socio-economic baseline environmental conditions, collecting primary and secondary data, evaluation of collected data and the ESIA report writing. During evaluation process all environmental issues polices, proclamations, guidelines, administrative structures were under consideration. The reviewers were made with stakeholders and the project area community representatives. The major adverse environmental impacts expected as a result of the feed mill project were problems on solid waste, noise and offensive odor. These problems can be managed and mitigated through proper waste management, structural designing, workers protection from being exposed, etc. Finally, it is concluded that this project brings significant beneficial impacts in socio-economic development of the project area and the country as a whole. Therefore, no significant environmental problem does happen if the proposed measures are properly implemented as planned.

**Keywords :** Chicken Feed Mill; Antibiotic Growth promoters

**Abbreviations :** WIC: Wanza International Consulting; AGP: Antibiotic Growth Promoters; MFL: Mekelle Farms Ltd; DOCs: Day-Old Chicks

## Introduction

Since 1960s, EIA has evolved as a comprehensive important management tool in giving decisions regarding ecological, social, economic and technical impacts of projects on their environments [1]. Currently, in both developed and developing countries, EIA is seen as ongoing interactive processes, which can contribute to formulation of sound environmental management and planning strategies in achieving sustainable development

[2]. Health and sanitation are important need and of humankind as far as socio economic development directives are concerned [3]. The productivity of the citizens and the betterment of living standard shall not be anticipated without enhancing the accessibility of the sanitation and healthy environmental service facilities [4]. An article 40, 43, 44 and 90 of the constitution state about provisions of "Environmental Rights" for all Ethiopians and indicates that all persons of the country are entitled to "live

in a clean and healthy environment” and have to meet their basic needs in a sustainable manner.

In recent years, the EPA at different levels has been requesting techno-economic feasibility and EIA studies for various existing and new projects. In order to carry out ESIA study, Ethio-Chicken Feed Mill processing PLC contacted Wanza International Consulting (WIC). The two partners signed an official working agreement in May 21, 2014. Ethio-chicken is the largest poultry company in Ethiopia in which the operative companies are antibiotic growth promoters (AGP) poultry PLC and Mekelle Farms Ltd (MFL). These are sister companies and jointly operate under the brand umbrella of Ethio-Chicken. The parent company Aglow poultry owns entirely AGP and 73.5% of MFL. The Group focuses on producing and selling improving breeds of chickens to smallholder farmers in rural Ethiopia [5]. Compared to indigenous breeds, Ethio-Chicken's breeds are more productive [6]. The group primarily products are day-old chicks (DOCs) and feed [7]. The group also sells medicines, vaccines, disinfectants, and concentrated on breeding and hatching DOC's, and producing feed [8]. This “package” (DOCs, feed + medicines/ vaccine) is then sold on to small businesses.

Ethio-Chicken feed milling and processing factory is one of the above company partners and it has been producing chicken feed mixing, processing and packaging. The company is supplies its product for sister chicken breeding companies and other costumers. The company has been a capacity of processing 5000kg/hours and producing 12 different types of feed. The types of feed prepared can be classified based on the age of the chicken or egg layer and hens breeding for meat in need. Currently, the company has 71 employees and six of them are women. Depending on the market of chicken feed demand, in the future the working time of a machine can be increasing to 24 hours per day and it can be increases the number of labor and productions. The company mainly used local raw materials for the production of these feed, such as maize, bran, soya and limestone. But the company imports some chemicals (premix) from South Africa and Holland. Thus the process of feed mill production obviously has an impact on the environment and social like other developmental projects.

Therefore, this plant handed in away to implement the mitigation measures for negative impacts, and enhancement strategies for positive impacts to realize more benefits during its operational process. The headquarter of the company is located in Addis Ababa, Bole Sub-City, Woreda 03 and employs several highly trained and other types of persons. This report is prepared in line with ESIA requirements stipulated in the EIA Proclamation FDRE No 299/2002. Moreover, the ESIA study is to investigate the impacts of Feed Mill products on the bio-physical and human environments in the project area, to identify potential physical, biological and socio-economic environmental impacts as a result of the project and recommend mitigation measures for the most possible impacts that enable in ensuring environmental sustainability.

### Justification

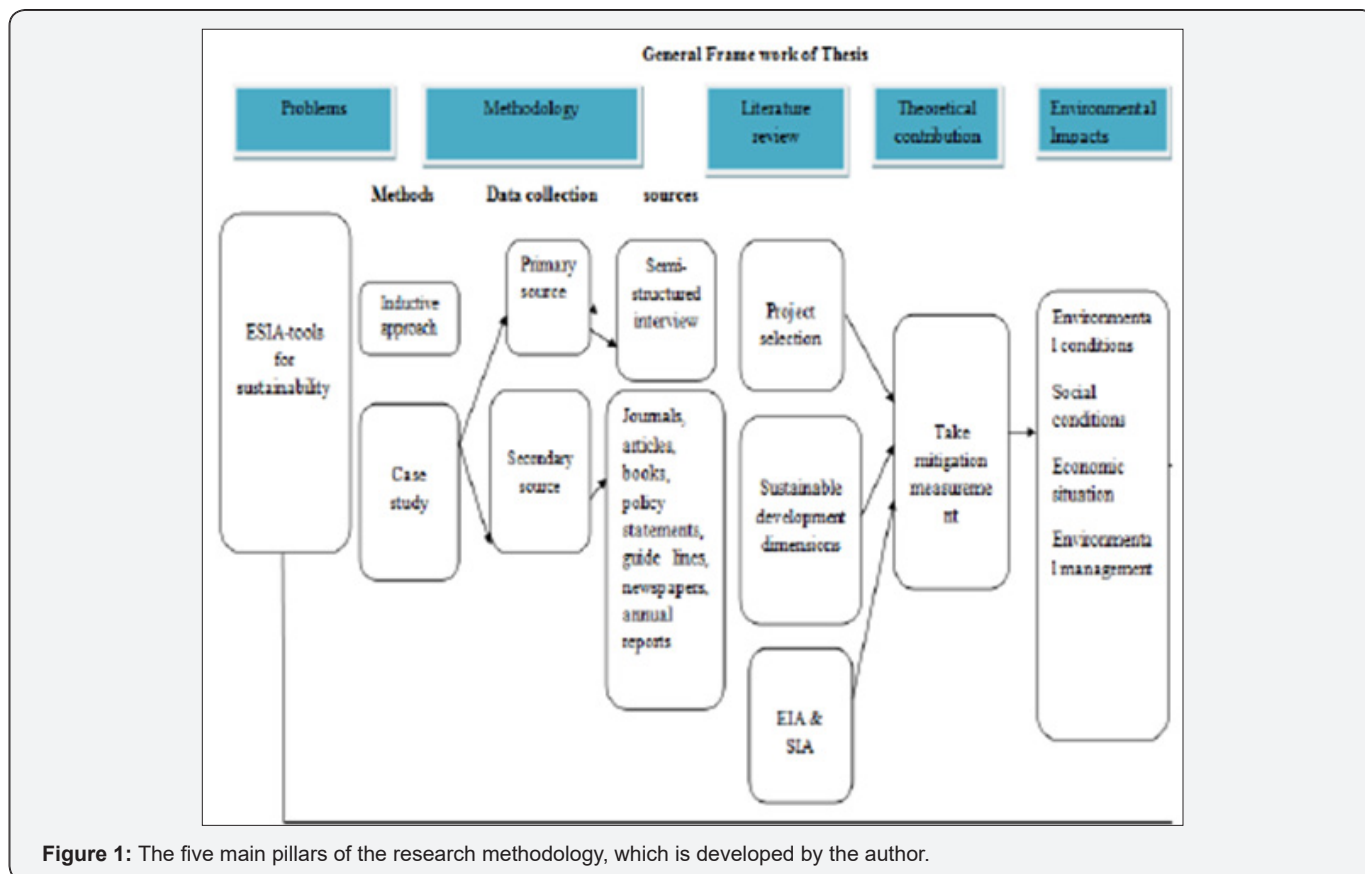
Ethiopian is the secondary largest population in Africa with an estimated population of more than 90 million people, and over the last decade it has been one of the fastest growing economies in Africa averaging Gross Domestic product (GDP) growth of over 10% per year [9]. This is one of the most exciting market opportunities in the world. The country represents a very large market opportunity as Ethiopians currently consumes only 0.5-0.6 kg/person/year of poultry meat and 20-25 eggs/person/year. These figures are significantly below in comparison with other African countries, such as Kenya and Tanzania [10]. The country's underdeveloped poultry sector has seen strong growth in consumption over the past 5 years largely enabled by the increased capacity of Ethio-Chicken. Since 2015, the Group has distributed about 5.5 million chickens to nearly 1 million households, managed to create a network of more than 2,000 out growers nationwide, and built an organization of about 550 full-time employees. Ethio-Chicken has a long-term strategy to reach every farmer in Ethiopia with productive breeds, affordable feed, and robust management training. This strategy will lead to lift women and the youths out of poverty, and create a more stable supply of protein at the household level.

The short and long-term strategies of the company is to bring healthy and affordable eggs and meat to every Ethiopian family, thereby improving food, nutrition and environmental security and creating income and job opportunities for women and youths. Therefore, to realize the intended objective expansion of the above Company's operations is inevitable producing quality and enough chicken feed is one of the most important strategies.

### Research Methodology (Figure 1)

#### Research Approaches

We follow two methods of research approaches, this are deductive and inductive approaches [11]. Based on the above consideration, the deductive research was presented when the theories reviewed in the literature are tested by the results of the empirical information that might be accordingly supported and, but the inductive approach was reversed in connection between theory and empirical findings; the researcher constructs theoretical frameworks upon the data studied in practice [12]. The deductive approach is also the commonest relationship between theory, practical of the project and research [13]. Based on this assessment purposes, it is thought as more appropriate the use of the inductive approach, and more acceptability the practical data collected from the ESIA in the research area, will help constructing the framework for sustainable decision making in the process of project selection and the project area was also meet environmentally friendship. Moreover, this business research recognizes one research strategies which is qualitative. As by many authors described, the qualitative research is more common in social sciences where opinions, perceptions and more in-depth knowledge is required than quantitative research strategies [14].



### Data collection

Primary and secondary sources of data were collected.

#### a) Primary data sources

Project area field observations, surveys, interviews or line sectors and individuals oral consultations, workers engaged in operational activities and nearby residents and experiments are some of essential primary sources of information and were collected.

#### b) Secondary data sources

Review of relevant polices, regulations, guidelines and annual reports of the companies, articles or literature reviews and local newspapers are an essential secondary sources and were collected.

### Rationale of the ESIA Study

ESIA provides the basis for better decision-making, to the extent that the implications of the ongoing project are thoroughly analyzed and comprehensive information is provided with the application, swifter decisions may be possible. In this way, environmental and social concerns become the integral part of the developmental decision-making process. Ethio-Chicken, as the company is legally committed to implementing the proposed project in line with the requirements of the applicable national legislations, guidelines and international polices particularly the international Finance Cooperation (IFC) Performance Standards.

### Scope of ESIA Study

This ESIA study has been undertaken in accordance with the national legislative (EIA Proclamation NO. 299/2002 and Directive No. 1/2008) and international requirements most notably the IFC Performance Standards, World Bank Group EHS Guidelines and Global GAP. As a result, the scope of this ESIA covers:

- Description of the proposed poultry feed production project, its components and activities throughout all project phases;
- Baseline information of bio-physical and socio-economic and cultural conditions within the project area of influence;
- Description of the pertinent policy, legislative and institutional framework applicable to the proposed project;
- Public consultations with relevant authorities, organizations, communities and any other interest and party that may be affected and /or interested by the proposed project;
- Identification of potential impacts on the general environment that may arise from project implementation process; and
- Proposing mitigation and management options to avoid minimize or offset any adverse significant biophysical and socio- economic impacts.

## Research Project Description

### Geographical location

The Ethio chicken feed milling and processing plant is found along Addis Ababa-Holeta town highway approximately 15km west of Addis Ababa. The Ethio chicken poultry feed milling and processing plant is located in Finine zuria, Oromia region especial zone, Burayu town administration. The mill is surrounded by flour, plastic recycling plant and soap factories as well as hotel, church, small shops and very few residential settlements. In order to process the product, to store raw material and product, office space etc 2,200m<sup>2</sup> are used (Figure 2).



Figure 2 : Birhanu Hailu1 and Yared Worku

### Map of the Project Area



Figure 3

An administrative map showing the location of Oromia regional state boundaries (regional zones and Woreda) in Ethiopia is given (Figure 2). Moreover, reconnaissance survey was conducted to assess floristic and faunal composition, conservation status and degree of human disturbance, and

hence help to detect, reveal and predict changes as a result of the impact of proposed poultry feed production project of the overall environment, particularly on vegetation characteristics (Figure 3).

### Policy, Legal and Instructional Framework

Various policies proclamations and environmental standard that are relevant to this project have been identified and reviewed. Policies proclamations and standards of relevance cover issues like environmental protection, pollution prevention and control health safety and environment the international conventions that are relevant to this project are also outline and their relevance to the project is explained. In addition Ethio-chicken's corporate directives that are relevant to this poultry development activity have been identified.

### Applicable National Policies and Strategies

The most relevant policies which stipulate the need for an impact assessment study and provide directives on how projects of this nature should be carried out in Ethiopia.

#### a) Environmental policy of Ethiopia (1997)

The EPA is an overriding policy for environmental and nature Ethiopia resources management in the country developed to address and setting out specific policy directives for different sector. The policy promotes mainstreaming of environmental concerns in the development projects are implemented in an economically viable socially acceptable and environmentally acceptable manner.

#### b) Ethiopian water resources management policy, 2001

According to the policy between 80-90% of Ethiopia's water resources is found in the four river basins namely Abay (Blue Nile), Tekeze, Baro Akobo and Omo Gibe in the west and south western part of Ethiopia where the population is between 30-40 %. The policy prioritized efficient utilization, equitable optimizing conservation and suitability of the unevenly distributed water resources as the engine of socio-economic development.

#### c) Policy strategy on Forest Development, Conservation and use

The underlying objective of the policy to meet public demand in forestry product and foster the contribution of forests and forest products in enhancing Ethiopia's economic development further sector specific guidelines and issues in relation to water resources is provided in the policy.

#### d) The agriculture Development Led Industrializations (ADLI) strategy

ADLI's is government's policy response specifically meant to address food security and fostering increased agricultural productivity as the engine for both agricultural and industrial



growth. The policy places emphasis on the transformation and commercialization of the small holders' agriculture for rural growth and facilitating take off of the commercial opportunities

### **e) Rural Development policy and strategy**

The policy sets rural development vision and comprehensive practical options to realized it due to significant contribution of agriculture sector to employment and GDP, 80 % and 45% respectively, and rural nature of the Ethiopian live hoods emphasis is placed on the agriculture development trade industry and expansion of the urban context in this case the agriculture-centered rural development has been adopted as an overall strategy in realizing economic development.

### **Policy & Strategy Summary of the Most Relevant Requirements**

#### **a) National energy policy of Ethiopia**

The policy intends to facilities implementation of the ADLI provision of incentive for the participation of the private sector and community in the development of energy resource. Admits, escalating energy demand for the realization of the sector's development objectives. Development of the alternative energy resources such as solar power, wind power and geothermal is highly encouraged by the policy.

#### **b) Ethiopian strategic Plan for Intensifying Multisectorial, 2004-2008**

The Key mission of the Plan is to prevent and control transmission of the HIV/AIDS and reduction of its socio-economic impacts through comprehensive programs and participation of all key stakeholders and public throughout the country. The plan seeks active involvement of women in the prevention care and support activities. The plan envisages mainstreaming of its key strategic issues of areas in the daily activities and work places.

### **Applicable Proclamations, Regulations and Directive**

#### **a) Environmental impact Assessment proclamation No.299/2002**

The law provides under its Article 3/3 and 5/1/2 that every project that falls in the category listed in any directive issue (directive No 1/2008 issued to determine projects subject to EIA) shall be subject EIA as guided by environmental protection agency (EOA). The proclamation prohibits any development to be initiated without securing an environment clearance Article 7 requires the project. In compliance to this requirement Ethio-Chicken decided to commission an EIA for chicken feed milling and processing factory.

#### **b) Environment Pollution Control Proclamation 300/2002**

The proclamation prevents any party from polluting the environment by controlling and disposal. Disposal of any hazardous waste without a permit from the authority or the

regional environmental agency stratify prohibited. The collection important preparation storage distribution transportation and use of hazardous chemicals or radioactive materials shall be subjected to a permit from EPA (article 4).

#### **c) Prevention of industrial pollution Council of ministers Regulations No.159/2008**

The proclamations industrial and other establishments are required to prevent and minimized waste generation and pollution to an amount not exceeding environmental limits set by relevant standard (Regulation 4). The component lice ding environmental monitoring system and mechanism for addressing public complaints on pollution.

#### **d) Solid waste management proclamation No. 513/2008**

The law prescribes management of each type of waste stream to ensure environmental suitability and enhanced public health. The stipulated management action plan for each waste streams are to be implemented at the lowest administrative units and community must participate. Construction permit shall be issued only when the contractor deposits a legally valid bond to ensure sound management of the construction wastes (article 12/2).

#### **e) Labor Proclamation No.377/2003**

This section require proponent to observe all care right and related matters including establishing basic employment standard provide a framework for collective bargaining for the prevention and settlement of disputes. Article 6 requires Ethio-chicken to provide formal written and signed contracts to its employees, take all necessary measures to ensure occupational safety and health measures as per directives observe working condition workers right (article 12, 95) and maintain a human resources Policy/manual. Article 113(1) state that workers and employers shall have the right to established and form trade unions or employer's association and actively participate therein

### **Biosecurity and poultry industry**

#### **a) Biosafety Proclamation No. 655/2009**

Ethio-chicken is required to undertaken detailed risk assessment by engaging a qualified expert and submit the report to the Authority article 6(1). The report will be disseminated to the relevant stakeholders for comments and /or terms. Further article 8(1) requires the developer to seek permit from the relevant authority for importation of any modified organism.

#### **b) Drug administration and control Proclamation No.176/1999**

All locally-produced and imported drugs shall not be put into use unless it is dully registered by the drug administration and control authority (article 16(1)). A certificate of registration that is valid for 5 years shall be granted for a registered drug (article 17(1)).

**c) Pesticides Registration and Control Proclamation No. 674/2010**

The law sets control mechanism of minimization of the undesirable effects to environment flora fauna and public health that may arise from utilization and improper management of the pesticides, formulation manufacturing, and importation packing. Repacking labeling selling distribution storage of use of pesticides unregistered by the ministry of agriculture is prohibited ( article 3) pesticide registration shall be valid for 5 years from the date of issuance of certificate of registration (article6) in the case of importing pesticides the ministry shall issue an import permit before importation is done (article 17).

**National Development Plans**

**a) Growth and Transformation Plan II (GTPII) 2015-202**

The underlying objective of the Ethiopia GTP II to serve as a springboard towards realization of the country’s socio-economic transformation and the vision to become a lower middle-income country by 2025 by ensuring sustained rapid board based and inclusive economic growth by enhancing productive Materials and Inputs

**Raw and Auxiliary Materials**

The basic raw materials required for poultry feed production include oil cake (soya), wheat bran, maize vitamins and minerals (premix). All the raw materials are locally available, except premix which will be imported. The auxiliary materials required for the poultry feed production plant are mixer machine, balance, packaging materials and transport cars (Table 1). The major operations involved in the production of poultry feed are raw materials preparation, pulverization of ingredients in a grinder or pulverized to the required mesh size, assorting and measuring, mixing the ingredients, meshing in a vibrating screen to the correct particle size and packing. The raw materials from the assorting tanks are measured in accordance to their use and then mixed by using a mixer. During mixing, fatty ingredients are added to the mix in order to raise the nutrient value of the feed. Upon requirement, the second crushing is by past. The final product is filled onto product tanks from which it is weighed and packed.

**Table 1:** The table showed that the total costs of all raw materials that is needed for the factory processes Production process.

Raw Materials	Raw Materials Needed/ years(kg)	Total Cost(birr)
Maize	11,520,000	69120000.00
Soya	5760000	706560000.00
Wheat bran	3456000	16588800.00
Limestone(CaCO3)	2304000	3225600.00

**Steps of Processing**

The following are steps of production processes. These are;

- a) Processing
- b) Formulation
- c) Weighing,
- d) Mixing,
- e) Packaging
- f) Labeling
- g) Storage

**a) Processing**

Processing seeks to modify the physical properties of raw materials to meet the specifications of products. Processing basically includes milling and mixing (packaging). A multi mill can be used to reduce particle size to the desired screen analysis. Regular checks should be performed to detect wear of mill screen and blades. The sieved and milled material is then bagged, weighed, labeled and transferred to the warehouse area for storage.

**b) Formulation**

This is an important and critical step in manufacturing quality products. Qualified personnel possessing knowledge and expertise regarding micro ingredients and powder technology should formulate a quality feed. The formulator has to consider source of ingredients based on their physical, chemical characteristics, bioavailability, their interactions when mixed, handling characteristics, and economic implications on the final product before any final conclusion is arrived at.

**c) Weighing**

The accuracy of the weighing balance enables precise weighing. The accuracy decreases with increasing size of the scale. Assurance in weighing can be achieved by calibrating balances against standard weights. The balances should be preferably calibrated daily in the beginning of weighing and documented accordingly. They should be cleaned before and after use and must be subjected for maintenance twice a year.

**d) Mixing**

The mixing process is the heart of any feed-manufacturing unit. In a feed the proportion of ingredients vary considerably; hence in order to obtain a homogenous blend the mixing operation should be divided into two steps. These are A) Micro mixing as the name suggests, is for mixing micro ingredients which weigh less than one percent of mixer capacity. These ingredients should be initially mixed in a smaller capacity mixer like double cone blender. The micro mix so obtained should be then mixed in the large mixer with all other ingredients and B) Macro mixing is the actual blending of all components of the ingredient along with carriers in a batch mixer.

### e) Packaging

The primary purpose of packaging for products is to maintain the stability of micronutrients and to protect the integrity of the composition. Improperly packaged products experience considerable loss in the potency of various sensitive ingredients. Selection or designing of packaging material should be according to the local climatic conditions. It should bear following properties:

- I. Provides barrier against light, moisture, oxygen
- II. No chemical interactions with the products
- III. Provides good printing surface
- IV. Sturdy enough to withstand the transport pressure.

The different types of packaging materials that could be use are glass containers, aluminum foil, paper and plastics. Ideally, aluminum foil lined multilayered paper bags provides an excellent barrier against light, moisture, oxygen, odor and flavor. Hence for very sensitive ingredients and where cost is not a constraint, aluminum foil package is the material of choice.

### f) Labeling

Label should have following information: name of the products, composition, net weight in the package (in kg), regulatory/statutory statements, date of manufacture in month/year, date of expiry in month/year, batch number, storage conditions, directions for use, name and address of the manufacturer with logo, and disclaimer note if any careful attention must be paid while preparing label since the customer follows the instructions given on the label. Any mistake made will be carried on to the feed and ultimately affect the performance of the chicken.

### g) Storage

The quality of feeds is also affected by the storage conditions in the premises until it is transported through distribution channels. The following steps are recommended during warehouse storage:

1. The temperature and humidity of warehouse should be controlled below critical levels.
2. Keep the area clean, well lit and ventilated with fresh air.
3. Store the premix on the pallet meant for it taking care not to store more than 10 bags on each pallet.
4. Design the storage areas to facilitate the FIFO (First in First Out) policy, with bags stored in consecutive order so that oldest can be withdrawn first.

## Environmental Impacts of the Project

Potential Positive Environmental Impacts

Among other benefits, the project is to:

- a) Makes job opportunity for 71 people which generate income.
- b) Can create opportunity for the community or population to expose to modern gardening, and recreation activities.
- c) Contributes to the realization of the development strategy particularly in the area of life-standard facilities improvements.
- d) Earns considerable profit to the proponent as well as to the city administration through tax.

## Negative Impacts of the project Potential Adverse Impacts on the Physical Environment and Mitigation Measures

Depending on the EIA general principles, project type, specific conditions of the project area and project needs, proper environmental mitigation measures were recommended for each identified adverse significant environmental impacts as the result of the Feed Mill Production Plant project. Moreover, the water, soil, air and other environmental issues were not affected by the project Feed Mill production plant, but it has a negative impact on the storage processes as we discussed the above in titled with storage.

## Mitigation measures to minimize the Negative Impacts

After identifying the specific negative impact, it is sensory and applies the mitigation measures. In order to put into operation run the business and secure the sustainability of the project, the proponent and its technical personnel should work on the following recommended mitigation measures to minimize the negative impacts.

- a) Make separate provision for storing sale return or expired products.
- b) Keep floors, walls and walkways clean, dry and free of any obstructions.
- c) Place sinks and bathrooms away from premix storage area.
- d) Keep the area free from pests and rodents
- e) No bag should be stored without any label.

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