Environmental and Social Impact Assessment Reports on Ethiopian Skylight Five Star Hotel Phase II Project

Client: Ethiopian Airlines

Main Contractor: China National Aero-Technology International Engineering Corporation (Ethiopian Branch)

Address: Bole Sub-city, Woreda 02

Contact: Mr. Wang Qianchao or Mr. Jou 0966-936008

Submitted to:-

Environment, Forest and Climate Change Commission

Consultant:

Mekuria Enviro Friendly Consultancy Firm

Address: Yeka Sub-city, Woreda 09, House No: New

Tel: 0941-626010 or 0911-735951

Email: nat032003lve@gmail.com

Web address: https://www.ecoparadize.com

July, 2019

Addis Ababa

Table of Contents

Contents Pages

Abbreviations and Acronyms

AAAWSA	Addis Ababa city administrative water and sewerage agency
AACA	Addis Ababa city administration
ACMA	Addis Ababa cleansing management agency
AAEPA	Addis Ababa Environmental Protection Authority
AADT	Average Annual Daily Traffic
ADD	Addis Ababa
CBD	Central Business District
CSE	Conservation Strategy of Ethiopia
EA	Environmental Assessment
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EISR	Environmental Impact Study Report
ESIA	Environmental and Social Impact Assessment
EMB	Environmental Management Branch
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
EPC	Environmental Protection Council
EPE	Environmental Policy of Ethiopia
ETB	Ethiopian Birr, the National Currency
FDRE	Federal Democratic Republic of Ethiopia
GDP	Gross Domestic Product
GFA	Gross Floor Area
Hazmat	Hazardous Material
HMSP	Hazardous Material Safety Plan
HSE	Health, Safety and Environment
HSEMP	Health, Safety and Environment Management Plan
ISWM	integrated solid waste management
OSH	Occupational and Safety Hazard
SSEM	Site Safety and Environmental Manager
UNEP	United Nations Environmental Programme
Veh	Vehicles
Veh/h	Vehicles per hour
WMP	Waste Management Plan

Executive Summary

Ethiopian Airlines Group (Ethiopian) A member of the Star Alliance, is the fastest growing Airline in Africa. In its operations in the past close to seven decades, Ethiopian has become one of the continent's leading carriers, unrivalled in efficiency and operational success.

The project site is located in the northern part of the Bole International Airport in Addis Ababa, Ethiopia. About One Kilometer (km) from the airport. The southern part of the base is the airport road, and the northeast is the city hall. The base has convenient transportation and excellent location.

The base covers an area of 17,319 square meters. The building area is 79,081 square meters. The underground area is 25,954 square meters. 53127 square meters above ground. The plot ratio is 3.07. The building density is 50%.The greening rate is 35%.

In order to echo the direction and shape of the first phase of the building that has been built, to ensure that more rooms have better lighting and orientation, the building adopts three slab forms that are parallel to each other, and uses a large glass roof as an atrium to connect three buildings. Because of the transparent glass atrium, the hotel has a similar living experience with the airport. The comfortable layout of the apartment is also simple and convenient. The design of the program effectively combs the functions and streamlines of the hotel, and strives to achieve reasonable functional partitions. The multiple streamlines do not interfere with each other and are independent of each other. The spacious podium in the podium is ideal for organizing large banquets and events, and the rooftop deck provides guests with a great location to get closer to the natural environment of the city of Addis Ababa and to the Bole International Airport.

The area is used and proposed in the LDP for constructing mixed-use residential buildings sothat the proponent has planned and designed to build a mixed use purpose building. The area is suitable for the proposed project.

Ethiopian Airlines Group (Ethiopian) h*as already acquired the necessary land through lease agreement with the city government of Addis Ababa. This EIA report investigates the possible environmental impact of a mixed-use building Project to be established in Addis Ababa City, Bole Sub-city, Woreda 02, on total land of 80,420.75m^2 of which 17,318.29 m^2 is the actual Project site with an estimated total project cost of 149 million dollars.*

According to some studies, construction industry in the world is rapidly growing at a rate of 5.5% on average. This reality is also experienced in the Ethiopian context; it reaches to 12% in the year 2014/15 (Amit Bijon et al (2014)). Miscellaneous studies show that the housing conditions of Addis Ababa doesn't meet most of the requirements of buildings where human lives or used it as an office or commercial purpose (Alemayehu H., 2015). Irrespective of this, the construction

environmental protection, monitoring and management plans. Basically, the consultant has collected and reviewed published national and/or regional policies, legislatives, regulations and guidelines. Thus, the most important and relevant policies, legislatives and institutional frameworks at international, national and regional levels were reviewed and included in the report.

The project site is located at an area which is found next to the promoter current place where used as an idle place since then. Officially, the promoter presented request to the city government to employ it for project expansion and is transferred by lease system as of 10th August, 2008 with title deed number 'ቦሌ01/319/142-6669/33102/01'. The landuse of the area where the study focused is a mixed-use place and is inundated by hotels, restaurants and service giving centers including, but not limited to 'Kategna Hotel and Restaurant' and SNV (the Dutch or Netherlands Government Charity and Development Organizations' head quarter) among Others.

The field survey conducted revealed that the area is one of the hot business area in town where hotel developers, malls and Mixed-use Apartments are habituated. As a matter of fact, it is customary to involve all stakeholders mainly adjacent business entities and neighbors as part of the study and hence the consultant team have discussed with adjacent business centres and neighbors surrounding the envisaged Hotel Project including Phase I Ethiopian Skylight Five Star Hotel Manager. It is well addressed under Stakeholders Consultation Section and can be seen in the latter Chapter for further referencing.

Potential positive impacts are creating job opportunity and technology and skill transfer especially in the time of construction and while operational this in turn generate income from tax specifically from income tax and it will also generate revenue for the Federal as well as the city government. According to the clients' key staff this typical Five Star International Hotel will involve up to 400 people of whom around 300 will be from the local people to be involved at the different stages of the envisaged project particularly during Construction phase. Apart from this, the envisaged project has a potential for economic benefits that include the capital investment, creation of market from the provisioning of hotel services that will be utilized in the entire project among others. It will also improve the services from hotel industries in the capital and will be an alternative by the city people as well as customers who came from abroad (both at transit flight and passengers who will came into the country for different purpose and hence the economic and aesthetic values of the local area in particular, the city in general will be

increased. Apart from these, it was learnt from the projects' Technical Description to the idea of incorporating 35% of the Project design by Green Area will make it one of the few buildings/complexes in the country as SUSTAINABLE BUILDING.

On the other hand, the project will have potential negative impacts especially during construction phase. Some of these impacts are: emissions of fined dust particles, particulate matter; smog emission from trucks and excavator; poor solid and liquid waste management; noise pollution; work place accidents; increment of car traffic; human traffic-jam in the business area near to the construction site, public safety risks, and increased pressure on utilities/services.

To avoid and minimize the negative impacts of the project, the following measures are proposed before implementation of the project; The major ones are, but not limited to, minimize the pressure on basic infrastructure the project should employ water and power conservation techniques, providing proper sanitary and drainage facilities, use waste minimization techniques and employing a waste management plan to reduce waste, Regularly placing signs around the construction site, having alternative entrances and exits for emergency operations and also using efficient equipment, machineries and the like can mitigate the effect of environmental pollution and degradation and even can avoid the risk of hazards in the construction of this Hotel use building.

Cost-effective and environmentally sustainable techniques that can mitigate the adverse impacts were proposed. A total Sum of birr 263,000 Birr (Two Hundred Sixty Three Thousand Birr) is allocated for the environmental Mitigation and Rehabilitations purpose. On the other hand, for the Environmental Monitoring works, the proponent allotted 85,000Birr (Eighty Five Thousand Birr) for Operational Costs.

1. Introduction

In order to study either its beneficial or harmful effect; evaluation of any project through ESIA has become a must. According to some studies, construction industry in the world is rapidly growing at a rate of 5.5% by average. Undertaking ESIA for construction industry and improving site management can reduce Environmental impacts both on and off site. In order to appreciate the risks posed by construction activities and taking steps to reduce incidents and costs and further to improve business reputation, the undertaking of ESIA is indispensable.

A massive increase in urban population would also create huge challenges for urban local bodies, mainly in maintaining the Environmental quality without any compromise in the human well-being. It is beyond doubt that urban planning, infrastructural development and the resource consumption patterns of the emerging urban space will impact ecosystems both within cities boundary as well as outside, with implications for the quality of life for people across countries.

Urbanization, especially in the developing world, is frequently accompanied by the deterioration of the urban Environment. Air and water pollution, inadequate waste management and reduction of green areas are the major Environmental problems (*Amit Bijon et al (2014)).*

Environmental and Social Impact Assessment (ESIA) is a planning tool used in project appraisal and design, in view of ensuring sustainability. Accordingly, the fundamental objective of the environmental assessment for the current project is to ensure that the proposed project is environmentally sound and contributes to the development of environmental assets.

The Scope of the specific Work disclosed by the client, calls for the assessment of impacts of the building construction Project (Ethiopian Skylight Five Star Hotel Phase II Project) on physical and cultural resources of the project area; and to examine the potential sources of environmental impacts. It also requires the consultant to forward mitigation measures for adverse impacts; to undertake public consultation and to prepare Environmental Management and Monitoring Plan.
To assess the potential impacts of the project on the environmental resources, it is necessary to identify and analyze the potential impact areas of the project. Accordingly, the ESIA-study dealt with the identification, prediction and evaluation of the impacts of the proposed Ethiopian Skylight Five Star Hotel Phase II Project. Following the identification and evaluation of impacts,

it also identifies and proposes measures aimed at avoiding or minimizing adverse impacts on the one hand, and enhancement measures of the beneficial ones on the other hand.

The ESIA process followed the guidelines prepared by FDRE EPA (the now Environment, Forest and Climate Change Commission). The consultant has also made use of specific methods and tools to accomplish the Environmental and Social Impact Assessment including desktop document review, field visits and stakeholders' consultation including formal discussion with the surrounding community or Service giving institutions and/or residential Buildings.

As a matter of fact, the ESIA study process covers: Environmental Scoping; description of the proposed project works, assessment of baseline environmental conditions; analysis of potential environmental impacts; development of mitigation measures; preparing an environmental management and monitoring plans.

The Environmental and Social Impact Assessment (ESIA) guideline (EFCCC, 1999) prepared by Environment, Forest and Climate Change Commission (EFCCC) requires development project reduce adverse effects on the physical, biological and socio-economic environment. As the proposed project is among the list of projects which are addressed under Directive No.1/ 2008, it is among those investment projects that require ESIA study.

China National Aero-Technology International Engineering Corporation (Ethiopian Branch) as a Principal Contractor signed an agreement with Ethiopian Airlines commissioned Mekuria Enviro Friendly Consultancy-Firm (Who is dedicated to handle Environmental and Social Impact Assessment Studies for any Proposed Projects like the envisaged Project) is sub-contracted by the Principal contractor to conduct the Environmental and Social Impact Assessment (ESIA) of the Five Star Hotel Use Building Project (Phase II) Site.

Accordingly brief description of the methodology and the appropriate procedure are followed in this particular ESIA study as presented here under;

1.1.General Overview of the Project

Ethiopian Airlines Group (Ethiopian) A member of the Star Alliance, is the fastest growing Airline in Africa. In its operations in the past close to seven decades, Ethiopian has become one of the continent's leading carriers, unrivalled in efficiency and operational success.

Ethiopian is a global Pan-African carrier currently serving more than 84 international destinations across 5 continents with over 200 daily flights and is using the latest technology aircraft such as Boeing 787 and 777 aircraft. The carrier provides daily services to Washington Dulles Airport (IAD) using the B777 or B787 aircraft with convenient and easy connections through its main hub in Addis Ababa (ADD) to 49 cities across Africa. It was recognized for its

outstanding customer service by the leading global customer service rating organizations such as SKTRAX and Passenger Choice.

Ethiopian fleet includes ultra-modern and environmentally friendly aircraft such as the Boeing 787, Boeing 777-300ER, Boeing 777-200LR Freighter and Bombardier Q-400 with double cabin. In fact, Ethiopian is the first airline in Africa to own and operate these aircraft.

Ethiopian is currently implementing a 15-year strategic plan called Vision 2025 that will see it become the leading aviation group in Africa with seven business centers: Ethiopian Domestic and Regional Airline; Ethiopian International Passenger Airline; Ethiopian Cargo; Ethiopian MRO; Ethiopian Aviation Academy; Ethiopian In-flight Catering Services; and Ethiopian Ground Service. Ethiopian is a multi-award winning airline registering an average growth of 25% in the past seven years.

Fig 2: Partial View of the Overall Ethiopian Hotel (Ethiopian Airlines Group (Ethiopian) in 3D modeling when finalized (Source Credit: Clients' Project Document, 2019)

1.2. Objective of the ESIA Study

The overall objective of the EIA is to carry out an assessment of construction and operation of Ethiopian Skylight Five Star Hotel Phase II Project to determine whether or not the construction and operation and associated activities will have any adverse impacts on the environment, taking into account biophysical, social, cultural, legal and economic considerations.

1.2.1. Specific Objectives of the ESIA

- ✓ Describe the nature of construction to be undertaken;
- ✓ Verify compliance with environmental laws, policies and regulations as well as industry best practice and standards;
- ✓ Identify and analyze alternatives to the envisaged project;
- ✓ Identify, analyses and propose mitigation measures for positive and negative impacts and enhancement measures for positive impacts to be undertaken during and after the implementation of the project including;
- ✓ Recommending cost effective measures to be used to mitigate against the anticipated negative impacts;
- ✓ Prepare an environmental and social management plan (ESMP) report compliant with the environmental management and ESIA regulations of the country.

1.3 Approach and Methodology of the study

The EIA approach was structured so as to cover the requirements under the environmental policy of the country, as well as the environmental management (environmental impact assessment and audit) regulations, 1997. The approach mainly involved an understanding of the project background, building design, technology and processes, implementation plan, operation activities. In addition, baseline information was obtained through detailed physical and biological investigation of the proposed building project and its surrounding areas, stakeholder consultations (which included discussions with contractor, local communities, traders, local administration, private sector, government and private organizations), photography and, continuous discussions with the proponent. This approach emphasized key elements of the EIA, i.e., scoping; stakeholder engagement; baseline data collection; project description; assessment of impacts and identification of mitigation measures and integrated.

1.3.1 Methodology

I) Data Collection:

Data collection involved activities such as desktop assessment and discussion with the proponent, observation, detailed physical inspection of the proposed site and the surrounding areas to

determine the present and anticipated impacts of the proposed project, assessment of the approved structural and technical drawings for the proposed Hotel use project development and development of a photo log. The data obtained was used to assess potential impacts on health, safety, environment and the community surrounding the proposed site location. From the obtained data, environmental, health, safety and social concerns were identified in relation to the proposed project location and mitigation measures proposed for the negative impacts, while enhancement measures proposed for the positive impacts. Photography was used to capture salient features and baseline conditions in the project site and its neighborhood. The photos were used to define existing features in the project area and identify land use/land maps, existing local conditions and floral species in the area among others.

I) Consultation of Stakeholders:

Stakeholders that include the neighboring business entities were consulted in order to get their views, expectations, projected economic and social effects regarding the proposed project activities and location.

II) Data Analysis and Evaluation of Alternatives:

Checklists and the threshold limits were used in data analysis; while the proposed site location, technologies to be employed, product mix, scale of construction, potential environmental impacts, capital and operating costs, suitability under local conditions, and institutional, training, and monitoring requirements were considered in the evaluation of alternatives. The proposed project's impacts were identified using a developed checklist, public consultation information, literature and professional knowledge. Accordingly, impacts were first distinguished as either positive or negative, the proposed project's negative impacts were analyzed to denote their significance based on their characteristics and this was also impacts per project phase. Significance was judged based on their capacity to change baseline conditions beyond acceptable standards or legislative provisions. A qualitative scoring matrix was used to give a value/score of each impact on the environment.

III) Preparation of the Project Report:

This Environmental and Social Impact Assessment report was then prepared by approved and registered firm, Mekuria Enviro Friendly Consultancy Firm, which is familiar with the

provisions of the environmental management and coordination act (EPA), 1997 and other relevant regulations and laws internationally as well as Ethiopia's as indicated in the legal framework.

1.4 Assumptions

The following assumptions are considered in conducting this Environmental and Social Impact Assessment for the proposed project. When one or more of the assumptions are violated, the impacts that this project is going to have on the Environment as well as the society living in the projects' surrounding will be different than the predicted impacts in this report.

- Recognizing the future expansion plan of the proponent company, the description of the processes, the materials either recycled or reused presented in this ESIA report are prepared by taking the company's future expansion plan in to consideration;
- The nature and scale of the investment will remain for the unforeseeable period of time in the future as is described in the project description section of this report.
- The client (Ethiopian) will be expected to allocate sufficient budget to implement the proposed mitigation measures as best as possible in in timely manner by recruiting appropriate professional.

Thus, here follows more assumptions apart from the above;

The Scope of investigation is limited to assessing the Environmental Impacts Associated with constructing of a Hotel use Building (**Ethiopian Skylight Five Star Hotel Phase II Project**) and its associated infrastructure;

- ✓ On a more ordinary level, it is assumed that all or nearly all relevant applications or potential applications in the area have been identified. It is possible that there will be some gaps in knowledge related to the number of plant species and/or any salient feature (Natural or Artificial) potentially affected and the difficulty of identifying every detail pertinent to every one of them, Environmental impacts in general by the proponent (Ethiopian) side;
- ✓ It is also assumed that in cases where unforeseen impacts may arise during the pre-construction and post-construction phases of the investment. The supervising engineering consultant will report to the client and to concerned stakeholders for the appropriate actions to be taken in time.

1.5. Team Composition Involved in studying of the envisaged Project

Table 1: List of Experts Involved in the Study

Sector	Name (s)	Age	Years of Experience	Qualification Educational/Professional	Proposed Designation	Relevant Experience	Consultant/ In-House	Nationality
Gas Emission Controlling and Pollution Senior Analyst	Mekuria Demisse	40	20	M.A in Geography & Environmental Education/ Senior Pollution Consultant and Senior Green House Gas Emission Control Analyst in ESIA Reports	Principal Consultant	Office Representative and Team leader directly involved in many EIA and EMP studies for different projects, Project Evaluations etc for different companies & Individuals under same firm including Placer Gold Exploration and Mining Projects ESIA Assessments among others	In general, in all the accomplishments of the firm as Lead Consultant and Senior Consultant specially on the areas of ESIA Studies, EMP Studies, Project Evaluations, Researching, Training etc	Ethiopian
Socio-Economic Affairs Consultant	Abiy G/Yohannese	35	8	M. A in Sociology and Degree in Social Anthropology	Socio-Economic Affairs Senior Consultant	Environmental and Social Impact Assessment Study (ESIA) for Ethiopian Apartment Use Condominium Building, Environmental Management Plan Study for Unillver Ethiopia Base Powder, ESIA study of Gondar City Drainage and Sewerage Master Plan Design Works among Others.	All Environmental Issues especially Waste Management and related Activities	Ethiopian
Ecosystem and Biodiversity	Yared Getaneh	39	12	M. Sc in Environmental Science and Degree in Plant Science	Senior Ecosystem and	Engaged in many Researches and EIA Studies which require	All issues in related with Flora and	Ethiopian

Analyst Senior Expert					Biodiversity Analyst Senior Expert	same profession under Mekuria Enviro Friendly Consultancy	faunas of the Local Environment under Study	

1.6.Organization of the Report

The ESIA report is organized, but not limited to, in Eleven sections and non-technical executive summary.

I. **Section One:** is the introduction that discusses introduction about the study, its objectives and methodologies used and assumptions;

II. **Section Two:** Scoping Report

III. **Section Three:** is devoted for the discussions of Pertinent Environmental Policies, Proclamations and Regulations are discussed;

IV. **Section Four:** Description of the Proposed Five Star Project;

V. **Section Five:** Environmental and Social Baseline Conditions;

VI. **Section Six:** Potential Environmental and Socio-Economic Impact Identification and Description of Impacts;

VII. **Section Seven:** Alternatives;

VIII. **Section Eight;** Public Consultation;

IX. **Section Nine:** Impact Mitigation Measures;

X. **Section Ten:** Environmental Management and Monitoring Plan;

XI. **Section Eleven**: Conclusion and Recommendations.

2. Environmental Scoping

2.1 Limitation of the study area

As described on the introductory part, the proponent owned of lands in Bole Sub-city in Woreda 02 and House No. New. The proposed area in the LDP is categorized to entertain only commercial/business use buildings if one wish to construct that is why the proponent has planned and designed to build a Five Star Hotel use building with all its facilities. The Solid Investigation, Water Test Result and field Observation by the consultant team have indicated that the area is suitable to establish the proposed project. Thus, this particular study is confined on the aforementioned area and its surrounding to prepare the ESIA and EMP report in this particular assignment.

The delineated area is one of the hot business centres in the capital and have been experiencing different complexes which are built for the purpose of business or commercial use and hotel use building are dominant on the studied area among other buildings Structures. One Example could be Ethiopian Skylight Five Star Hotel Phase I Project. There are no conservation area, small and medium level industries etc are observed.

Photo 1: Partial Views of the Proposed Project Area and its Surrounding Vicinity (Photo Credit: Consultant Company Study Team, 2019)

The major limitation of the study area (the micro-climate) is unavailability of compiled data, background information, related social, economic and environmental concerns and well-articulated research and assessment in related to similar investment activities.

2.2. Valued Ecosystem with the study area to be Impacted

Apparently the studied area is completely in a commercial/mixed-use block as per the city master plan categorization. The intervention area have been an idle place which have been an open field for long time and few houses having the purpose of cafeteria, restaurants and Bars. According to the promoters' key contact, the area was once used to be bunches of bars and Night Clubs as well as small restaurants. As the City government label the different parts of the city as different area Scales for Developers (Level 1, Level 2, Level 3) for the purpose of Industrial Use, Real Estate, Residential Buildings, Commercial Use Building, Mixed use building etc. Other than these, *no plant species nor does domestic as well as wild animal species have been observed on the intervention area and it's nearby.*

Apart from these, the area is a proposed place for LDP program to construct mixed/commercial use complexes and hence experienced many buildings for same purpose in the past few years. According to the proponent and neighboring business owners, the specific area have been empty for long time and belongs to the city government and hence there is no any development of an area or expansion except the proposed activity.

When we measure the adverse impacts which could happen as a result of developing the area, it doesn't outsmart the benefit which could be obtained in related to in the subsequent times. In short, the social, economic and environmental situations of the specific intervention placement activity will be put into place as per the rules and regulations of the respective disciplines..

2.3. Concerns of Key Stakeholders

Stakeholders' consultation aims to increase the participation of all the stakeholders, including people and/or business centres residing in the project area, the Principal Consultant (AVIC) key staff and the Client (Ethiopian) among others. Stakeholders' consultation was held with the objective of influencing the identified stakeholders to participate at each key stage of the project construction works, and that the concerns of stakeholders are reflected in the design and construction works. Accordingly, the consultant team communicated adjacent business centres

and/or Service giving private and Non-governmental Building Owners to get their inception on the proposed activity and to make sure the participation to ease for sustainability.

It was learnt from the field survey that there are no serious environmental and social concern raised by the participants who were approached by the consultant team while asked about the proposed construction activities if happened. However, some serious concerns were mentioned including proper construction of sewerage tanker, parking area, Speed limits of vehicles, car washing on communal places such as on the main road etc were discussion points.

3. Administrative, Legal and Policy Framework

3.1. Policy, Legislative and Institutional Frame Works

Development programs and projects should comply with available policies, legislative and institutional frameworks and standards for proper execution and implementation. Knowledge of the policy and legal frameworks within which the project is going to be implemented would facilitate the project performance and helps to ensure sustainable development. There are several policy and legal documents both at federal and regional level as regards to environmental management and development projects.

The discussion in here concerns the National Development and Environmental Policies and Sectoral Strategies, legislations and guidelines, Institutional arrangements, land accusation, tenure rights and expropriation procedures are also indicated in the discussion.

Understanding of available policies and administrative structures, under which the project implementation and the environmental assessment and management study operates, would assist in the efforts made for sustainable development and natural resource conservation measures.

3.1.1. Policy Issues

The economic policy of the Federal Democratic Republic of Ethiopia (EFDRE) is a market – based, agricultural led industrialization mode of economic development. The administrative structure is at federal as well as regional level with duties and responsibilities shared among them.

Responsibilities of development activities are clearly demarcated between Federal and Regional Governments based on the scale, characteristics and magnitude of the investment to be undertaken. Accordingly, construction of development activities that crossing more than one regional government boundaries is the responsibility of the federal government, while the construction of such type mixed use building, within a region is the duty of the respective regional governments.

3.1.2. Conservation Strategy of Ethiopia

Countrywide study of the existing natural resource base and environmental conservation and protection strategies have been conducted in the early 1990's and conservation strategy of

Ethiopia (CSE) has been approved. The CSE emphasizes the importance of incorporating environmental issues in to development activities right at the initial stage of development.

3.1.3. Environmental Policy of Ethiopia (EPE)

The overall policy goals of the Environmental Policy of Ethiopia is described as "…to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs".

3.1.3.1.The Guiding Principles of the EPE are:

- Every person has the right to live in a healthy environment;
- Sustainable environmental conditions and economic production systems are impossible in the absence of peace and personal security. This shall be assured through the acquisition of power by communities to make their own decisions on matters that affect their life and environment;
- The development, use and management of renewable resources shall be based on sustainability;
- The use of non-renewable resources shall be minimized and where possible their availability extended (e.g. through recycling);
- Appropriate and affordable technologies which use renewable and non-renewable resources efficiently shall be adopted, adapted, developed and disseminated;
- When a compromise between short-term economic growth and long-term environmental protection is necessary, then development activities shall minimize degrading and polluting impacts on ecological and life support systems. When working out a compromise, it is better to err on the side of caution to the extent possible, as rehabilitating a degraded environment is very expensive, and bringing back a species that has gone extinct is impossible;
- 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;

- Market failures with regard to the pricing of natural, human-made and cultural resources, and failures in regulatory measures shall be corrected through the assessment and establishment of user fees, taxes, tax reductions or incentives;
- Conditions shall be created that will support community and individual resources to sustainably manage their own environment and resources;
- As key actors in natural resource use and management, women shall be treated equally with men and empowered to be totally involved in policy, programme and project design, decision-making and implementation;
- The existence of a system which ensures uninterrupted continuing access to the same piece(s) of land and resource creates conducive conditions for sustainable natural resource management;
- Social equity shall be assured particularly in resource use;
- Regular and accurate assessment and monitoring of environmental conditions shall be undertaken and the information widely disseminated within the population;
- Increased awareness and understanding of environmental and resource issues shall be promoted, by government officials and by the population, and the adoption of a "conservation culture" in environmental matters among all levels of society shall be encouraged;
- Local, regional and international environmental interdependence shall be recognized;
- Natural resource and environmental management activities shall be integrated laterally across all sectors and vertically among all levels of organization;
- The wealth of crop and domestic animal as well as micro-organism and wild plant and animal germplasm is an invaluable and inalienable asset that shall be cared for;
- Species and their variants have the right to continue existing, and are, or may be, useful now and/or for generations to come; and

- The integrated implementation of cross-sectoral and sectoral, federal, regional and local policies shall be seen as a prerequisite to achieving the objectives of this Policy on the Environment.
- The Policy further outlines both sectoral and cross-sectoral environmental policies. Sectoral environmental policies include:
- It further points out that; Preliminary and full EIA are undertaken by the relevant sectoral ministries or department if in the public sector and by the developer if in the private sector.
- Need for public consultation;
- Environmental impact assessments consider not only physical and bio-logical impacts but also address social, socio-economic, political and cultural conditions;
- Need for environmental audit at specified intervals during the project implementation.

3.1.4. Water Resource Policy

The Ministry of Water, Irrigation and Energy has formulated the Federal Water Resource Policy for a comprehensive and integrated water resource management. The overall goal of the water resources policy is to enhance and promote all national efforts towards the efficient and optimum utilization of the available water resources for socio-economic development on sustainable bases. The policies are to establish and institutionalize environment conservation and protection requirements as integral parts of water resources planning and project development.

3.1.5. Biodiversity Policy

The biodiversity policy, which was approved in 1998, provides guidance towards the effective conservation, rational development and sustainable utilization of the country's biodiversity. In general, the policy consists of comprehensive policy provisions on the conservation and sustainable utilization of biodiversity.

3.1.6. Population Policy

Ethiopia developed its Population Policy in 1993. The rationale behind the policy is that with increased human numbers, the population carrying capacity of the land decreases. Forest cover is

estimated to have declined from 40 to 3 percent. Large expanses of land with large herds of livestock are said “to play havoc with the environment”. The policy has as its major goal:

“The harmonization of the rate of population and the capacity of the country for development and rationale utilization of natural resources to the end that level of welfare of the population is maximized over Time”.

3.1.7. Women Policy

The constitution FDRE recognizes equal rights of women and men; however, the traditional societal structure keeps women in a very low position and vulnerable situation. Women occupy a very small percentage of key political and government decision making positions.

Harmful traditional practices are common in the country; about 80 percent of women have undergone Circumcision and other harmful traditional practices. Early marriage of young girls is a common occurrence among most cultures in Ethiopia. Some studies and reports suggest that violence against women is quite high and increasing every year.

Ethiopian women also experience heavy work load and mainly domestic work. It is estimated that on average, women work 15-18 hours per day. Women also do not have access and control to resources. According to the 2003 Agricultural census, only 18.6% women among farming communities were able to have ownership of agricultural land. On the contrary, women among the pastoral communities could only own property if they could only have a male guardian.

3.1.8. Health Policy

Ethiopia’s health policy was issued in 1993, with the aim of giving special attention to women and children, to neglected regions and segments of the population, and to victims of manmade disasters.

The priority areas of the policy are in the field of Information, Education and Communication (IEC) of health to create awareness and behavioral change of the society towards health issues, emphasis on the control of communicable diseases, epidemics, and on diseases that are related to malnutrition and poor living condition, promotion of occupational health and safety, the development of environmental health, rehabilitation of health infrastructures, appropriate health service management system, attention to traditional medicines, carrying out applied health

research, provision of essential medicines, and expansion of frontline and middle level health professionals.

3.1.9. Policy on HIV/AIDS

The HIV/AIDS pandemic is spreading worldwide and heating hard poor countries mainly. Sub Saharan Africa, with only 10% of the world population having 80% of the world HIV infection and AIDS cases. Among the Sub Saharan African countries, Ethiopia stands fifth in HIV/AIDS infection.

Ethiopia is one of the countries in the world that is facing HIV/AIDS pandemics, and about 3.5% of the population is said to be HIV/AIDS affected. HIV/AIDS has now become a major social and economic problem of a country although some information sources indicate the magnitude of the expansion is dwindling significantly. Having understood the magnitude of the problem, the Government issued HIV/AIDS policy in 1998.

The general objective of the policy is "to provide an enabling environment for the prevention and control of HIV/AIDS in the country". The policy also urges government ministries and the civil society to assume responsibility for carrying out HIV/AIDS awareness and prevention campaigns.

The policy introduces and outlines the large social, psychological, demographic and economic impact that HIV/AIDS will be having and introduces a number of issues relating to HIV/AIDS.

3.2 Environment Related Legal Framework

There are several proclamations provided by the FDRE related to Environmental protection issues. Among these are:

3.2.1 The Federal Constitution

The Federal Constitution of 1995 sets out important articles related to Development and Environmental rights; Article 43 discusses the right to development.

The Constitution under Article 44 highlights about environmental rights as follows:

- All persons have the right to a clean 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.
- Under Article 92 the constitution discusses about environmental objectives as:
- Government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment.
- The design and implementation of Programs and Projects of development shall not damage or destroy the environment.
- People have the right to full consultation and to the expression of views in the planning and implementation of environmental Policies and Projects that affect them directly.
- Governments and citizens have the duty to protect the environment.

3.2.3 Environmental pollution control proclamations No. 300/2002; sets rules on control of pollution, management of hazardous waste, chemical and radioactive substances, management of municipal wastes etc. Outlines sectors that require environmental standard, environmental inspectors, and incentives, rights to appeal, Offences and penality.

3.2.4 Environmental Impact Assessment Proclamation No. 299/2002

It is promulgated in December 2002. The primary objectives of this proclamation are to make EIA mandatory for defined Categories of activities undertaken either by the public or private sector. The proclamation under its General provision Article –3, sub article-1 states that without authorization from the Authority (EPA), or from the relevant regional environmental agency, no person shall commence implementation of any project that requires environmental impact assessment as determined in a directive issued pursuant to Article-5 of the proclamation. Article 5 describes projects requiring Environmental Impact Assessment as follows:

- Every project, which falls in any category listed in any directive issued pursuant to this proclamation, shall be subject to Environmental Impact Assessment.

- Any directive provided under sub- article-1 of Article –5 should among other things, determine categories of; a) Projects not likely to have negative impacts and so do not require EIA, b) Projects likely have negative impacts and thus require environmental impact assessment.
- EIA-Guide lines have been prepared both at federal & regional level. These guidelines follow the conventional procedures adopted elsewhere in the world. .

3.2.7 Proclamation 513/2007, Solid Waste Management

Proclamation 513/2007 aims to promote community participation in order to prevent adverse effects and enhance benefits resulting from solid waste. It provides for preparation of solid waste management action plans by urban local governments.

3.2.8. Labour Proclamation (377/2003)

The Labor proclamation requires an employer to take the necessary measures to adequately safeguard the health and safety of the workers.

3.2.8.1. Labour (Amendment) Proclamation (494/2006)

The labour proclamation no. 377/2003 hereby amended as follows:

The provision of (C) of sub-article 2 of article 2 of Article 3 is deleted and replaced by new provision (C) of sub-article 2 of Article 3

''(C) Managerial position who is vested with powers to lay down and execute management policies by law or by delegation of the employer depending on the type of activities of the undertaking with or without the aforementioned powers an individual who is vested to hire, transfer, suspend, layoff, assign or take disciplinary measures against employees and include legal service head who recommend measures to be taken by the employer regarding managerial issues by using his independent judgment in the interest of the employer.''

The following new provisions (g), (h) and (i) are added to sub-article 1 of article 39:

''(g) Where he has no entitlement to a provident fund or pension right and his contract of employment is terminated upon attainment of retirement age stipulated in the pension law;

''(h) Where he has given service to the employer for a minimum of five years and his contract of employment is terminated because of his sickness or death or his contract of employment is terminated on his own initiative provided that he has no contractual obligation, relating to training to serve more with the employer.

''(i) Where is contract of employment is terminated on his own-initiative because of HIV/AIDS.

4) Article 185 is deleted and replaced by the following new article 185:

''185 common offences

/1/. An employer, a trade union, a worker or representative of employer which;

(A) Violets the provisions of this Proclamation or regulations or directives issued hereunder relating to the safety of workers and commit an act which expose the life or health of a worker to a serious danger, or doesn't give special protection to women or workers or young workers as provided for this proclamation;

Applicability of this project: the labour, recruited temporarily & permanent basis, it will done based on the above stated proclamations.

3.2.9 Public Health Proclamation (200/2000)

This proclamation prohibits:

- The discharge of untreated liquid waste generated from septic tanks, seepage pits and industries into water bodies, or water convergences.

The disposal of solid or liquid or any other waste in a way which contaminates the environment or affects public health.

3.2.10 EIA Procedural Guideline, November 2003

The guideline outlines the screening, review and approval process for development projects in Ethiopia and defines the criteria for undertaking an EIA.

3.2.11 Guideline for Environmental Management Plan (Draft) May 2004

The guideline outlines the necessary measures for preparation of an environmental management plan (EMP) for proposed developments in Ethiopia and the institutional arrangements for implementation of EMPs.

3.2.12 Noise Standards: Ethiopia has no national legislation for noise, but World Bank guide lines have been adopted by EPA and are used for benchmarking purposes along with the draft National Noise Standards that are being prepared. The guidelines being adopted by EPA for Ethiopia for daytime perimeter noise is 55 decibels (DBA).

Table 2: Limit Values for Noise level

Area Code	Category of area	Limits in DBA	
		Day time[1]	Night time[2]
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45

Source: World Bank, 2012

Note:

1 **Day time reckoned to be between 6.00 am to 9.00pm**

2 **Night time reckoned to be between 9.00pm to 6.00am**

3.2.13 Ambient Air quality Standards:

Ethiopia has no national legislation for air quality, but World Bank guidelines have been adopted by the EPA and are used for benchmarking purposes along with the draft National air quality Standards that are in preparation by the EPA. Table 2 provides the provisional air quality standards being adopted by EPA for Ethiopia as well the WB/IFC guidelines values.

Table 3: Limit Values for Emissions to Air

Pollutant	Units	Guideline Values	
		Ethiopian standard	WB standard
Particulate Matter PM2.5	jig/Nm^{J}	None	30
Particulate Matter 10	j^g/Nm^{J}	150	100
Sulfur dioxide (as SO2)	lig/Nm^{3}	1000	400
Nitrous oxide (as NO2)	jj.g/Nm^{J}	2000	600

3.3 Institutional and Administrative Framework

The Federal Democratic Republic of Ethiopia (FDRE) has two levels of administrative structures, Federal level Government and regional governments. There are nine regional governments

under the Federal Government. Roles and responsibilities of governments at different levels (Federal, Regional, Zonal &Woreda) have been defined by the constitution and proclamations Nos. 33 of 1992, 41 of 1993 and No. 41 of 1995. Under these proclamations, duties and responsibilities of regional states are included.

The current project shall be implemented in the Addis Ababa city administration. The city administration further classified sub city and Woreda (District) administrative organs.

3.3.1 Addis Ababa City Government(now Environment and Green Development Commission) EIA Regulation No.21/2006

This EIA regulation is not much different in its content from the EIA proclamation number 299/2002. The regulation forces specific development projects to implement its EIA accordingly and puts forward the need for obeying the EIA proclamation. The EIA regulation has also made EA to be mandatory legal prerequisite for the implementation of major development projects. This regulation is a proactive tool and a backbone to harmonizing and integrating environmental, economic and asocial consideration into decision making process in a manner that promote sustainable development.

3.3.2 Environment and Green Development Commission

Formerly Addis Ababa City Government EPA structure has been decentralized up to Woreda level in the ten sub-cities. The Commission has been established with the following responsibilities;

- Formulate strategies, programs or guidelines pertinent to environmental protection and follow up its implementation up on approval.
- Collection, making analysis and keeping record of data on natural resources and rural lands including social and economic situation of the region.
- Regulate and follow up that any development activity is planned and implemented without damaging the environment and disturbing its balance,
- Initiates laws and guidelines pertinent to the environmental protection for the government, and up on approval regulate, follow up and evaluate their implementation,
- Monitors any damaging effects on habitat and divers living organisms.
- Conducts capacity building and awareness creation programs as regards to environmental and natural resources conservation, development and protection.

3.3.3. Addis Ababa EPA (the now Environment and Green Development Commission) Environmental Pollution Control Regulation

These regulation shall be applicable to factories, commercial enterprises, educational centres, health institutions, industries, other enterprises, home and similar activities and on polluters which generates and extracts hazardous material and on pollutant which is believed to harm and brin; about negative impact over the environment.

Also, it is applicable to approved projects and established enterprises prior to the issuance of these regulations. The details of the regulation can be referred from the full contents of the Regulation 25/2007 attached at the annex part.

3.3.4. Ethiopian Building Code: Proclamation No. 624/2009

This proclamation determine the minimum national standard for the construction or modification of buildings or alteration of their use in order to ensure public health and safety; and will apply in urban centers that have 10,000 or more dwellers;

It regulates the design, material used and other minimum standards to guide and control the public safety. Control and regulate the materials intended for use and stored on site or incorporated in the works, to be removed from the sits or the works, ban the use of improper materials.

The regulation also give attention for the surrounding economic and public movement any building shall be designed and constructed in such a way that it shall not impair the safety of people moving around, other constructions and properties, excavation related to a building is likely to impair the safety or stability of any property or service, the owner of the site shall take adequate precautionary measures to ensure that the safety and stability of such property or service is maintained.

This code applies, to building construction, maintenance, renovation, demolishing and other associated activities to all classes of buildings stated in Ethiopian building proclamation. This code covers the health and safety precautions for the most common construction activities. If a building construction involves special method/s of construction, the builder needs to come up with the associated health and safety precautionary measures for such method/s. The

occupational health and safety requirements specified in this document are only the minimum requirements.

Building standards and regulations encompasses all aspects of house construction. Building standards and regulation includes: the types of building materials used in the construction of house, the building height, amount of left over space and built up space (bar), setbacks, layout of building, building permission etc. Appropriate building regulations and regulatory frameworks have impact in reducing difficulty and long bureaucratic processes to enter into legal housing and minimize irregular and unplanned settlements. According to Essayas (2000), building codes and housing standards help to protect human welfare in case of developed countries too.

However, as Laquian (1983) has suggested, there are diverse ideas concerning the importance of building codes and housing standards to the developing countries. Hence, building codes and housing standards limit the capacity of low income households from building their own houses (ibid). In most developing countries in Africa, most of the building standards and regulations are adopted from the developed countries without adjusting to the local context (tipple, 2000; un-habitat, 2011).

As Payne (2001) has noted, the regulatory frameworks and planning approaches in developing countries are based on the past historical concepts and assumptions of the colonial countries ironically these planning regulations still have been applied in developing countries. In the matter of facts, these approaches have been abandoned a very long time by the ex-colonial countries and they changed with more pragmatic, flexible and contextual related approaches (ibid). The alternative building materials such as the traditional building materials: straw bale or rammed earth are not allowed in building regulations even in the recent time (Wheeler and Beatley, (EDS), 2009). Many developing countries' building regulations adopted during colonization insist the use of conventional building materials rather than cheap and locally available materials (UN-Habitat, 2011).

As turner (1976) noted, it is not only developing countries' policy problem, but also all national and international housing and planning agencies mislead the problem of housing by applying quantitative measures. Turner (IBID) argued that, quantitative methods cannot describe the relationships between housing and households. But quantitative methods can only indicate (not

measure) non-quantifiable components. For instance the quantitative method may express resource allocation as well as helps to identify complex relationships. Turner (IBID) continue arguing, what relevant a house provide is the activity or the usefulness for the households which should not expressed by material standards unless it used as a manipulation for bureaucratic and commercial purposes. As cities alliance (2003) has pointed out, materials based building standards consequences housing price increase which in turn force low income households to extend/build and increase housing options as their finance and personal need informally. According to un-habitat (2003), the violation of building standards and regulations becomes more harmful when house transformation carried out by the tenants rather than by the home-owners. Hence, the tenants have a little concern about the alteration and they are free of governmental building regulation responsibilities. As Abrams (1966) has identified, some of the drawbacks to self-help housing were that self-help houses take a long time to build; construction by families is imperfect due to lack of experience; and efficient construction is not achieved since the modern techniques of mass production are not used (Charles Abrams, 1966 p. 171). Low standard of housing condition created by the owner transfer.

4. Project Description

4.1 General Background

Addis Ababa was founded hundred seventeen years ago; the city emerged first as a garrison town and then become permanent seat of central government since its foundation. Over the years, Addis Ababa has grown into an important urban center in the country. As different literatures depict, the capital covers a total of 540km^2 and about 5 million people, which are ten folds of the population of the second largest city in the country, i.e, Dire-Dawa. From the outset of this general information, one can imagine how Addis is dominant in Ethiopian urban hierarchy.

Primacy of Addis is explained not only by the size of its inhabitants, but also by concentration of economic, social, political and cultural activities of the country. As virtue of its geographical location, Addis is the transport and commercial hubs of the country; almost all the import – export transactions take place in the capital. The city hosts a number of international and regional organizations; it is headquarter of AU and UN-ECA, as well as seat of many other multinational organizations and diplomatic missions.

Despite of such national, regional and international importance, Addis Ababa hardly meets the required urban quality and standard of international city in its physical fabric as well as in the level of infrastructure and service provisions. The larger parts of the city including inner and expansion areas of the city are predominantly occupied by unplanned, irregular/informal settlements characterized by dilapidated and substandard structures, faulty road alignments and unsightly activities.

The ESIA project report is based on information and consultations with the project proponent, the architects, quantity surveyors, engineers, and financial analysis's and details contained in the drawings of the proposed project (attached at the annex). The above aim is to provide a new focal point for hotel industry and improve tourism sector and it is anticipated that the cosmopolitan development will catalyze the capital city's development.

4.1.1 Study Area Descriptions

The proponent has invested on an area of in a total site area of 80420.75m^2 of which 17,318.29m^2 lands is a Construction Site located in Bole Sub city Woreda 02 where labeled as commercial/mixed use by the city government. Thus, the study is confined to the aforementioned area and its surrounding to prepare the EIA as well as EMP reports in this particular assignment. The proponent has proposed a Five Star building on an area of 42,410m^2 lands. The delineated area is neighbored by a Five Star Hotel belongs to the same client (Ethiopian Skylight Five Star Hotel Phase I), Asphalt Road in four directions including main Asphalt road which take to and fro from Meskel Square to Bole International Airport. The area will be expected to be more hot business centre than does before. The area is approximately 100m far from the main Asphalt road and has different alternative access road to simplify the traffic flow for both during construction phase and operational phase. On the site, there are basic infrastructure like electric power main line, municipality sewerage system. Telephone line and main asphalt road among the few to mention.

The major limitation of the study area is unavailability of compiled data, background information and well-articulated research and assessment in related to similar investment activities and related social, economic and environmental concerns.

Photo 2: Partial Views of the proposed Project Area where showing the Actual Construction Site ((Photo Credit: Consultant Company Study Team, 2019)

4.1.2 Project Location

The proponent of this project has proposed a Five Star International Building with Architectural design of B+G+9, at Bole Sub-city, Woreda 02 and House Number New which falls on the east of Addis Ababa.

Bole Sub-city is one of the 10 sub-cities of Addis Ababa with a total population of 308,714. According to CSA (2008) report, the population density by sub-city (of the specific sub-city) is 120.93 Square Metre in area wise. The sub-city is located in the centre of the town and is bordered by the sub-cities namely Nefas Silk Lafto, Kirkos, Yeka and Akaki Kality Sub-cities from the four relative directions.

Ethiopian has proposed to construct a Five Star International Hotel building as a continuation of Phase I Project with similar design and function like before. Accordingly, the client business

plan is triggered towards for the successful implementations of the building plan mentioned above. The promoter has given due attention for the wellbeing of the environment and urban setting as well as the neighboring business centers and designed to maximize the benefits of all stakeholders. From the discussion with the promoter, it was learnt that the architect design is made to address environmental friendly components and targeted to make it one of the first building and hotel in East Africa as well as the whole Africa which is Climate Smart. That is why; this study is commissioned to Mekuria Enviro Friendly Consultancy Firm, to assess the projects' environmental and social impacts as per the applicable EIA guidelines.

Plate 1: Location of the Proposed Site from Google Earth (Source Credit: Clients' Project Document, 2019)

Here follows the details of the Site Plan as explained by the Architecting Consulting Company (AVIC);

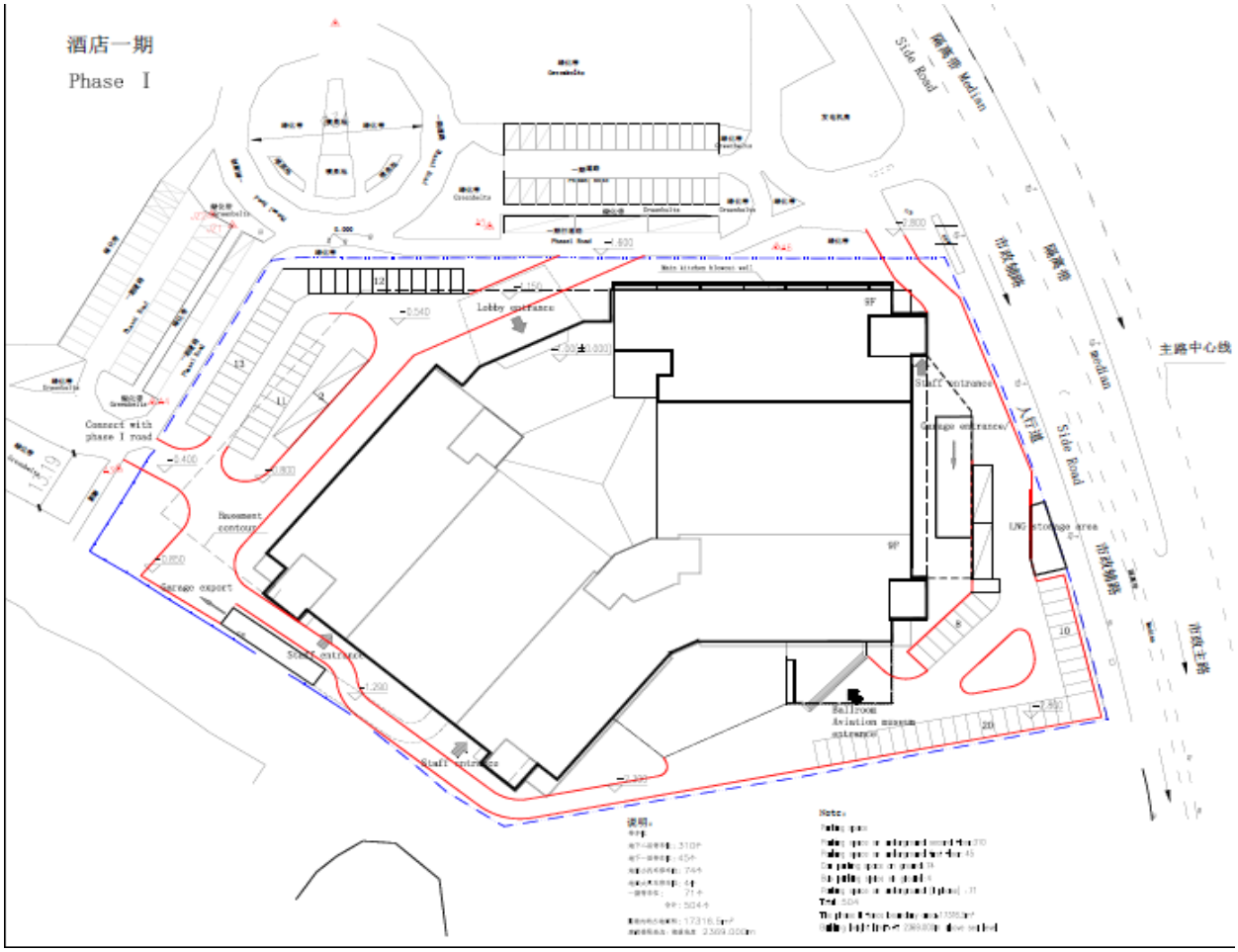

Plate 2: The general layout of the Proposed Project

4.2. Land Tenure, Use, Ownership and Management

The property under reference land use type is to implement mixed use building (complexes) and is now entertaining different buildings including Phase I escarpment and other buildings in the near distant. The proponent has planned to construct the Five Star Hotel Building (Phase II Project) in a land the building in an own place where there existed a store house which has been

used to produce wood products and hence the proposed building project will be constructed by demolishing the same.

4.3. Project Design Descriptions

The project Site is located in the Northern Part of Bole International Airport in Addis Ababa about 1Km from the Airport. The southern part of the base is the air road and the northeast is the cist hall. The base has convenient transportation and excellent location.

The base covers an area of 17,319 square meters. The building area is 79,081 square meters. The underground area is 25,954 square meters. 53127 square meters above the ground. The plot ration is 3.07. The building density is 50%. The Greening rate is 35%.

In order to echo the direction and shape of the first phase of the building that has been built, to ensure that more rooms have better lighting and orientation, the building adopts three slab forms that are parallel to each other, and uses a large glass roof as an atrium to connect three buildings. Because of the transparent glass atrium, the hotel has a similar living experience with the airport. The comfortable layout of the apartment is also simple and convenient. The design of the program effectively combs the functions and streamlines of the hotel, and strives to achieve reasonable functional partitions. The multiple streamlines do not interfere with each other and are independent of each other. The spacious podium in the podium is ideal for organizing large banquets and events, and the rooftop deck provides guests with a great location to get closer to the natural environment of the city of Addis Ababa and to the Bole International Airport.

4.4. Utilities

The utilities and facilities including water, electricity, sewerage, storm water drainage, transport and traffic, fire reticulation. In order for the project to achieve its objectives varying quantities of utilities will be necessary as ancillary and primary inputs.

4.4.1 Electricity Supply

Apparently, the existing overhead line from main road to site is 120kw, which is currently, lies adjacent to the site discussions between the proponent and EEU (Ethiopian Electric Utility) yielded that the lead-time to install a three phase power sources. From the clients' key personnel, it was learnt that all the power supply for the envisaged project will employ 6400KVA in total. Calculations on the initial master plan indicated a total electrical demand of approximately three

phases. In addition, there are Two Stand-by Diesel Generators for Sustainable Power Supply to run the overall system.

4.4.2 Sewerage System

The by-laws require all new buildings to be provided with effective sewer connections within the recommended distance. If no such public sewer exists within the recommended distance or if it is not practical to connect with such sewers, then the drain should empty into septic tanks or soakage ways or as the council may direct. The project design has a septic tank of 32.5 m^3. The proponent have already planned to connect the waste water to Manucipal Sewerline which crosses the site in the near distant.

4.4.3 Water

The envisaged project will employ water for miscellaneous use from own backyard source from its ground water potential to be developed within the same perimeters of the development area. This water resource will be extracted from 400meter depth well water and will have a volume of 40 cubic meters per hour. The Ground water potential will cover 80-90% of the total estimated volume of water but the rest of the water consumption will be fulfilled from the municipality water source. The Municipality water will be mainly employed for Hydrant purpose to be installed in the selected area in and/or around the development perimeter.

However, the project will also consider other sources of water due to the known high demand on water infrastructure in Addis Ababa like in the case of Sewerage Water emanate from the Hotel among others.. Thus the following are some of the sources of water that the project will use.

4.4.3.1 Sewerage Water

As a matter of fact, the Hotel will generate significant amount of waste water mainly from Toilets, Kitchen and Cleaning process (Laundry, Floor Cleaning etc). The Proponent has a plan to treat the Sewerage Waste by designing dedicated Septic tank and then introduce a sewerage treatment device which will have the capacity to treat almost 10m3/hr waste water and to reuse it for the purpose of watering the Garden. As observed from the Architectural Design, the building density is 50%.The greening rate is 35%.

Apparently, the envisaged project will not consider harvesting of roof water as part of its water source, as disclosed by the principal contractors' key experts.

4.4.3.2 Storm Water Drainage

Addis Ababa has a mean annual rain fall of 1,115 mm), even at a modest sized 50 m^2 roof, can potentially yield up to 40 m^3 of water annually. For the preliminary calculations it has been assumed that the entire development site will be impermeable, whether through building development or hard landscape areas and roads.

The topography of the development site is a general fall from the highway in the north towards the east. Preliminary calculations have been carried out to determine the quantity of runoff from the site but will need to be checked with verified climatic details for the vicinity (as rainfall can be quite localized). e.g. The extent of future soft landscaping will reduce the runoff volumes but it is anticipated that these areas will be small (10-15% maximum) of the development areas and therefore not significant in the initial calculations.

The choice of storm water drains will include having open storm water drains alongside the roads, although cheaper to construct than buried pipes; they affect the aestheticism of the site.

4.4.3.3 Off-Site Drainage

There do exist storm water drains to the west of the site, which are owned by Addis Ababa city administration, but their spare capacity is unknown. The nearest storm water drain is located near the site. There is a limitation on the peak discharge to this drain since it leads to an existing culvert. Most of the off-site existing storm water infrastructure is either silted over or has been damaged/removed over time. If any are to be used in the development storm water design surveys will be required to calculate their capacity and condition.

The simplest solution may be to discharge all of the site runoff into an off-site storm water system. from preliminary calculations, which assumed an increase from 25% run-off now to 100% run off in the future, the 10-year runoff increases from 1.1m^3/s to 5.3 m^3/s. this additional flow, if the existing drains are currently at capacity, will need to be supplemented with an additional 300 mm diameter pipe based on an assumed 1 in 100 gradient or equivalent open channel. for a 1 in

100 year design, the runoff increases from 1.1 cubic meters per second to 5.3m3/s. the existing drains will need to be supplemented with an additional 600 mm diameter pipe based on a 1 in 100 gradient or equivalent open channel.

Alternatively, the off-site flows can be reduced by providing and capturing rainwater run-off for other uses. This will reduce the peak flows and hence the size of connection pipes required.

4.4.3.4 On-Site Drainage

The current topography on site generates two low points, one at the centre / north, and the other at the southern boundary. The on-site drainage can be dealt with by reshape the site with bulk earthworks. The cost of this in terms of earthworks and environmental aspects would be considered if this option was to be pursued.

4.4.4 Transport and Traffic

The site of the project is 5 meter or so from the main road, so it is easy for the entrance of the car and park in the arranged parking lot. The traffic loads and peaks have been investigated to show that the primary access to the development will be through the access gate fed from main road junction. Pedestrians will also have access from this area and on main road on top having public transport services that are currently found in the area.

4.4.5 Fire Reticulation

The proponent and his insurers' standards for fire protection are likely to be higher than the statutory minimum as required by Addis Ababa city council and the fire brigade. Therefore, this will be adopted informed by proponent and approval of this approach will be sought from the relevant authorities.

Access for fire brigade vehicles will be provided around the site, with fire hydrants spaced to give adequate coverage to the perimeter of all buildings. If the hydrants are served from water source truck, the pressure within the main is usually adequate as the fire engines have an in-built booster pump. In this case, water truck would take over the fire reticulation system and hydrants at the end of the defects liability period, having already approved the design of the entire water reticulation system before construction.

4.5 Project Cost and Schedule

The proposed project is estimated to cost 149 Million Dollar. This cost includes the feasibility study, engineering component, geotechnical and hydro geological study, environmental impact assessment study and others). the construction will be conducted using a phased approach with construction of tower 1 being completed before the developer moves to tower 2 as per the construction schedule based on the availability of adequate financing of the total cost as well as the amount of fund that the funding source releases as per the schedule set.

4.6 Construction Phases Process, Equipment, Materials, Wastes & Output

4.6.1 Processes

Site preparation, land clearing and decommissioning the existing structures; relocating the 120kw power lines; digging trenches for the perimeter wall; erecting the perimeter wall, access gates and constructing a security office/post; installing construction firefighting equipment; soil compaction for the parking, loading areas and paths; building the site foreman's office; digging the internal sewerage network trenches and laying the network pipes; building a materials' storage; soil excavation for the foundations; digging trenches for the sewerage network and installing it to connect; filling the foundations; lining the foundation with PVC ;erecting construction pillars ; erecting the walls for the buildings; constructing the roofs and water tanks; fitting and plumbing the water network around the buildings; electrical fittings in the buildings and around the site with switchboard, transformers etc.; plumbing and piping the office and storage units ;installing emergency generators and water pumps; installing elevators and escalators; establishing sewerage facilities and connections; tarmacking the parking area and paving the paths; erecting a fence around the site; landscaping the site and facilities ; installing in house amenities such as lights, doors, windows floors, carpets etc. and interior decoration; placing firefighting equipment |installing facility waste management equipment e.g. bins ; installing perimeter and internal site lights i.e. streetlights; painting the internal roads and placing signs around the site.

4.6.2 Equipment

Chainsaw; earth mover; compactor; spades; wheelbarrow; hammers and bolt and nut fasteners; handsaw; bolts, nut, screws and nails; ropes; ladders; electric and gas welders; electric saws and grinders; gas cutters; spirit level; road roller; trucks; hand drills and drill bits; glass cutters; wire cutters; shears; cranes; mobile electric power generators; concrete mixer trucks; wheel loader; fork lift & telescopic Fork Lift; tractor ; excavator ; Asphalt paver and dump truck. And Tower Crane; bar straightening machine, bar bending machine, die head threading machine; pan saw; concrete; vibrating spear; concrete mixing plant; concrete pump; vertical transport equipment.

4.6.3 Material and Energy

Sand; fuel and oil; electricity; water ; cement and ceramic tiles; concrete; polythene; bricks and gravel; water; steel; concrete pipes; steel pipes; PVC pipes; Polyfilla, adhesives and paints ; ceramics tiles; copper wires ; plastic; electricity ; gas (acetylene & oxygen) ; cardboard; PVC; glass ; bricks ; asphalt and bitumen.

4.6.4 Expected Waste

Construction Waste: paper, polythene, metal shavings, cement, concrete, welding particles, plastics, sand, grey water, adhesives, paints, soil, plants, cloth, rubber.

Air Emissions from vehicles engines and burning and friction operations (CO_x and SO_x). Oil and fuel spills from vehicles and storage of oil and fuel. Dust from movement of vehicles and excavation activities.

Sewerage and domestic/Municipal waste; emanate from sanitary system and waste water generated from construction activities and make their way to drainage system or possible line.

4.6.5 Output

Primary and ancillary project facilities (commercial units, residential units, retail area, common area, perimeter wall, security posts and access gates, storage facilities etc).

5. Baseline Environmental and Socio-economic Conditions

Ethiopian has proposed a modern Skylight Five Star Hotel Phase II Project building having a basement with ground plus 9 storied building on its plot no or title deed number 'ቦሌ01/319/142-6669/33102/01'. in Addis Ababa, Bole sub-city, Woreda 02, House no New commonly called Africa Union Square area or the way to Bole International Airport Avenue. The project area is situated in a gentle slope or ground with an average altitude of 2500m above sea level.

It is one of the development aspect when we mention about express road in the suburban part of the city. Its proximity to the express way and Bole International Airport will make it one of the hot business Centre in the near future. The area is home to several new blocks, residential and ideal for new house developers. This makes the site appropriate for the proposed project.

Over the past ten years, Addis Ababa has been growing rapidly. However, the growth rate of new apartment's construction as well as infrastructure growth to cater the ever growing population falls far below demand. Thus, there is an urgent need of rapid development of new blocks as well as infrastructure to accommodate the demands and influx of the working class and community into emerging new industries.

Addis Ababa was founded in hundred twenty years ago; the city emerged first as a garrison town and then become permanent seat of central government since its foundation. Over those years, Addis Ababa has grown into an important urban center in the country. Currently, the capital covers a total of 540km^2 and more than 5 million or so populations, which are ten folds of the population of the second largest city in the country, i.e, Dire-Dawa. From the outset of this general information, one can imagine how Addis is dominant in Ethiopian urban hierarchy.

Primacy of Addis is explained not only by the size of its inhabitants, but also by concentration of economic, social, political and cultural activities of the country. By the virtue of its geographical location, Addis is the transport and commercial hubs of the country; almost all the import – export transactions take place in the capital. The city hosts a number of international and regional organizations; it is headquarter of AU and UN-ECA, as well as the seats of many other multinational organizations and diplomatic missions.

Despite of such national, regional and international importance, Addis hardly meets the required urban quality and standard of international city in its physical fabric as well as in the level of infrastructure and service provisions. The larger parts of the city including inner and expansion areas of the city are predominantly occupied by unplanned, irregular/informal settlements characterized by dilapidated and substandard structures, faulty road alignments and unsightly activities.

Photo 3: Partial view of current project in one of the Site Corner

5.1 Physical Environment

5.1.1 Atmospheric Condition

5.1.1.1 Climate and Metrology

The Hotel Building project is intended to be implemented on Woreda 02, House no New in Bole Sub-city which is the eastern parts of the city. Addis Ababa lies at an elevation of 2,300 meters (7,200 ft) and is a grassland biome, located at 9°1′48″n 38°44′24″ecoordinates: 9°1′48″n 38°44′24″e. The city lies at the foot of mount Entoto and forms part of the watershed for the Awash River. From its lowest point, around bole international airport, at 2,326 meters (7,631 ft) above sea level in the southern periphery, the city raises to over 3,000 meters (9,800 ft) in the Entoto mountains to the north.

Addis Ababa has a sub-tropical highland climate and has a complex mix of highland climate zones, with temperature differences of up to 10 ℃ (18 ℉), depending on elevation and prevailing wind patterns. The high elevation moderates temperatures year-round, and the city's position near the equator means that temperatures are very constant from month to month (Wikipedia, 2019).

5.1.1.2 Geology and Soil

Addis Ababa city is situated in the western margin of the main Ethiopian rift and represents a transition zone between the Ethiopian plateau and the rift with poorly defined escarpment. It is represented by four volcanic units in the lower part by basaltic lava flows (Addis Ababa basalt), followed by pyroclastic sequence, mainly ignimbrites (Addis Ababa ignimbrite), followed by central composite volcanoes (central volcanoes unit), and finally small spatter cones and lava flows (Akaki Unit).

The proposed building site is predominantly constituted of fill material at the top, silty clay/clayey silt underline by very dense sandy silt some gravel and occasional core stone layer at the middle and rock layer at the lower zone. The site is free from surficial visible geological structure which would affect the proposed building. The topography of the site has a flat ground and a ground water was not observed during site investigation.

5.1.1.3 Ecological Environment

A) Flora

The vicinity of Addis Ababa (New Flower), especially in the northern hills was once covered with mixed indigenous forests consisting of tree species such as Juniperus Procera, Podocarpus Falcatus, Olea Africana, Hagenia Abyssinica, Acacia Abyssinica, however, already at the end of the 19th century, the natural vegetation was reduced significantly due to population growth and expansion (Swain, 1955) and replaced by eucalyptus tree in most of the Northern part of the city.

The project area is categorized in mixed use building center and hence embedded by different service giving and/or Hotel use buildings as well as new building which is a enough space from the actual construction site inside the compound to plant some trees which will have Ornamentak and Conservation Purposes like Juniperous Procera (‘Tid) and *Zenbaba* inside the proposed area compound which was recommended by the assessment team..

B) Fauna

Urban farming contributes to most of the faunal species in residential areas of Addis Ababa in terms of animals reared as livestock. Some of the animals reared in Addis Ababa include poultry, goats, sheep, cattle, pigs and rabbits (Lee Smith et al, 1994). Most of the faunal species noted from the scoping survey were mainly as a result of urban farming and they included goats, chicken and cattle.

C) Ecological Sensitize Areas and Threatened/Rare/Endangered Species

The project site doesn’t lie in any protected areas or ecologically sensitive areas and it’s not a habitat or spawning ground for any threatened, rare or endangered species. The Project is located in the urban extent of Addis Ababa.

D) Economic Condition of Addis Ababa

The economic activities in Addis Ababa are diverse. According to official statistics from the federal government, some 119,197 people in the city are engaged in trade and commerce; 113,977 in manufacturing and industry; 80,391 homemakers of different variety; 71,186 in civil administration; 50,538 in transport and communication; 42,514 in education, health and social services; 32,685 in hotel and catering services; and 16,602 in agriculture. In addition to the residents of rural parts of Addis Ababa, the city dwellers also participate in animal husbandry and cultivation of gardens. 677 hectares (1,670 acres) of land is irrigated annually, on which 129,880 quintals of vegetables are cultivated. It is a relatively clean and safe city, with the most common crimes being pick pocketing, scams and minor burglary. The city has recently been in a construction boom with tall buildings rising in many places. Various luxury services have also become available and the construction of shopping malls has recently increased. According to Tia Goldenberg of *iol*, area spa professionals said that some people have labelled the city, "the spa capital of Africa ("Tia Goldenburg, 2007).

E) Population and Demography

Based on the 2007 census conducted by the Ethiopian National Statistics Authority, the population of Addis Ababa is 3,384,569 million; all of the population is urban inhabitants. For the capital city 662,728 households were counted living in 628,984 housing units, which results in an average of 5.3 persons to a household.

According to the 2007 national census, 98.64% of the housing units of Addis Ababa had access to safe drinking water, while 14.9% had flush toilets, 70.7% pit toilets (both ventilated and unventilated), and 14.3% had no toilet facilities. In 2014, there were 63 public toilets in the city, with plans to build more. Values for other reported common indicators of the standard of living for Addis Ababa as of 2005 include the following: 0.1% of the inhabitants fall into the lowest wealth quintile; adult literacy for men is 93.6% and for women 79.95%, the highest in the nation for both sexes; and the civic infant mortality rate is 45 infant deaths per 1,000 live births, which is less than the nationwide average of 77; at least half of these deaths occurred in the infants' first month of life. The city divided into ten sub cities and 99 Woredas. (Wikipidia,2016).

Population is a major driver of environmental change in Addis Ababa and current trends point to

the continued growth of the city. This suggests a higher number of inhabitants with lifestyles that demand high energy, more land for the built environment, and increasing natural resources consumption. This has implications for the natural ecosystems that are crucial for maintaining ecological and ultimately economic stability.

F) Socio-economic Importance of the Proposed Project

The proposed project is in line with the governments' urban development policy that aims to create a green and clean city with a healthy living environment to all socioeconomic groups in Addis Ababa. The project will therefore help to increase economic activity in the region by investing in the construction industry; the proponent will also contribute towards the economic growth of our nation through revenue collection. In particular, the proposed project will generate the following positive socio-economic impacts:

1. The proponent will rent the commercial building to different services like office, bank shops, guest house and apartment etc. The proposed project will therefore serve as a source of income to the proponent.
2. During the operation phase of the project, the proponent will be required to pay tax to the government hence contributing to the economic growth of the nation.
3. The proposed project will indirectly contribute towards enhancement of security in the neighborhood of the area.
4. The proposed project will generate revenue to the county through payment of connection and service fee.
5. During construction and operation phase, the project creates job opportunity.
6. It also contributing by create housing for the dwellers and guests

Apart from the direct employment of construction workers, the proposed project will also benefit the following categories of individuals:

- Transporters. Investors on lorry and trailer transport will benefit greatly from the project. This benefit will extend to vehicle dealers and manufacturers, lorry drivers and turn boys.
- Cement manufacturers. The local cement manufacturers and their employees and shareholders are direct beneficiaries of the development.
- The government will also get some impressive increase in V.A.T. And other taxes levied on cement.

- Manufacturers and dealers of other building materials. Most of the building materials to be used are locally manufactured. Relevant companies, their workers and shareholders will be direct beneficiaries of the development.
- Sand harvesters. Locals involved in sand harvesting in sand harvesting are to be major beneficiaries' of the project. The benefit will extend to the local authority entitled to levy taxes on sand transporters.
- Ballast quarries. There will be massive use of ballast. These will ensure that the quarry owners and workers benefits greatly.

6. Potential Environmental and Social Impact Identification

6.1.Overview

In order to assess the significance of the proposed project's impacts, the impacts were first identified from their source, which are the project's activities/equipment/processes/materials and then the impact receptor, which are the baseline environmental and social conditions. Accordingly, the following explanation is explicitly discussed hereunder;

6.2.Description of the Project Objectives and Environment

During field visit and discussion with the proponent and the Architect, the consultant understood that, the project going is to be in place on the land offered by the city government through lease system as categorized by the land use indicated in the LDP system. The site is located just at the main Asphalt road in 40metres diametres or so. The site is located in a relatively higher sloppy area. It may have impact of contamination by in sweeping away the excavated soil and oils from the truck during construction phase into the nearby drainage system. It is characterized by the occupation of Five Star International Hotel as Phase I by Ethiopian and existing Asphalt Roads in three directions. There is no any visible geomorphologic features such as gullies and river cuts.

The construction site resides near to the main road; there is no any other alternative roads to easy the traffic load and burden on the asphalt during transportation of the construction materials and removal of excavated soils.

From the design and discussion with the promoter, the project has the rainwater collecting structures and the collected water and discharge into the normal municipality drainage system. An option is also considered to use the wasted water for some further applications before discarding to the environment. The design also has the septic tanks to collect the liquid waste generated from the facilities. The waste will be connected to the already installed separated municipality drainage system or will be pumped out and dispose to the communal municipality disposal site.

As shown in the design, the new building will have outside glass windows from the 1st floor. The solid waste will be collected from each floor by janitors and accumulate the free space in the ground floor and will be disposed together with the municipality disposal system.

According to the Architect, the project will use rainwater-harvesting system to complement the water supply of the municipality during construction. There is only one source of electricity that is from the governmental grid (Considering Ethiopian Electric Utilities, EEU), so they use this source solely during construction and operation. The excavated soil will be transported and disposed to the sites where the government allowed, usually in the outskirt of the city or in an area where some legalized groups have been entertaining the demolished waste through some payments. The project will also use the timber pillars or young eucalyptus trees or metal stands during construction. Heavy trucks (big Lorries, excavators etc), will be utilized during construction and transportation of the materials. All the trucks are expected to be diesel system.

The project will use fully locally available materials and local professionals from designing to the finishing level. All the materials will purchase from the local supplier and importers.

The consultant confirmed that, the commissioned contractors conducted a soil and hydrological study by the certified consultant (AVIC) and the result will discusses in down in sub-titles.

For the accomplishment of the project from the beginning to finishing stage estimated to cost around 149 million dollar and allocated by the owner. It is estimated from one to two continuous years to finalize the construction and achieve the objectives.

6.3 Discussion of Positive and Negative Environmental and Social Impacts

In order to assess the significance of the proposed project's impacts, the impacts were first identified from their source, which are the project's activities/equipment/processes/materials and then the impact receptor, which are the baseline environmental and social conditions. The impacts were then classified as either positive or negative and the project phase in which they will occur and then they will be discussed individually in the later subsections of this chapter.

The following impacts are discussed with the assumption that the activities during operational and post-construction phases are potent to result in the course of time. Thus, the points hereunder are thoroughly discussed considering the pre-construction phase has almost no significant adverse effects with the assumption that the demolishing of the existed store will be accompanied with the necessary care not to damage or pose adverse impacts on both the lives as well as properties of the delineated neighboring houses .

6.3.1. Positive Impacts

The development of this project will have a number of significant positive impacts both locally and nationally.

6.3.1.1 During Design Phase

a) Relation of Employment and Business Opportunities

The design phase of the project will create employment and business opportunities for various professionals/consultants who will be involved in the planning stages of the project. They will include: project managers, engineers, architects, building economists, land surveyors, environmentalists, economists, and urban planners among others. These professionals are supposed to be employed directly in the project or be consultants whose services will be procured.

b) Generation of Income and Source for Government Revenue

Income generated from the consultancies and services undertaken will provide income which will be taxed and generate revenue for the state. In addition, fees levied for the submission of plans to the local authorities and state agencies for approval and application for services will generate revenue that is used to meet the various governmental goals and objectives. These include Mekuria Enviro Friendly Consultancy Firm, EPA, and Bole Sub-city amongst others.

Additionally in order to operationalize the proposed project financial resources will have to be mobilized and these will be injected into the economy. These resources will amount to the total project costs of 149 million Dollar in one to two years of construction period and it will be used for the services involved in the design and planning of the project and also acquiring the raw materials of the project.

c) Environmental Opportunities

The design phase of the project will also present opportunities for green/sustainable designing of the project, which support the minimization of environmental impacts whilst fortifying the project to achieve its intended objectives. It’s at this stage that the opportunities, which will enable the project, achieve a sustainable development are discovered, explored and integrated into the project. From the design, the consultant team observed that the proposed individual

rooms window will be covered by tempered glasses characterized by reflecting light which could convey high frequency such as Gama rays. These makes minor effect on the environment.

6.3.1.2 During Construction Phase

a) Creation of Employment

The activities involved in the erection, maintenance and management of the proposed houses will generate employment i.e. employees involved in the production, sale and transportation of the buildings materials, construction of the building, maintenance of the building and management (caretaker, domestic staff etc.). Security services, cleaning and waste collection are also some of the services that will benefit indirectly. Other employment opportunities that will be created will include for workers involved in the civil and interior works of construction such as engineers, masons, foremen, bricklayers, machine operators, interior designers, electricians, masons etc .According to the clients' key personnel, at least 300 people will be employed in both temporal and permanent basis.

b) Market for Goods and Services

To facilitate the construction activities goods and services including raw materials, plumbing services, electrical fittings, transport landscaping and finishing. It therefore offers a market for these goods and services promoting the primary and secondary sectors involved in their procurement such as: quarrying and brick production; furniture and carpentry; glass production; plant and gardening; tarmac, asphalt and bitumen; chemicals; building contractors; electric fittings; plumbing fittings and water infrastructure etc.

c) Increased Population

The influx of labour into the area and subsequent people/workers to service them or provide them with goods such as food will be another positive impact of the proposed project. This is taken as positive since the population increase if sustainable will create additional market for goods and services offered in the area, increase the amount of mobilized capital and also increase the social capital in the area.

d) Increased Economic Activities and Revenue

The construction phase of the project will also increase the economic activities in the region, and revenue for the central government through taxes, through businesses that will be formed to

service the increased population. These services include health, food and nutrition, transport and recreation that the workers taking part in the construction will require from time to time.

6 3.1.3. During Operational Phases

a) Increased Commercial Viability

The establishment of the project in the area will increase the economic viability of the area and will consequently increase the land values in the surrounding area due to the potential high returns after development. This will attract more high income investors into the region as well as more middle income groups as settlers.

b) Creation of Employment Opportunities

The proposed project will create employment in three tiers, with the first being the staff that will be primarily involved in its implementation, supervision and maintenance. the second tier will be staff for the businesses that will formed in the commercial and retail area and those involved in these businesses supply and value chains. The third type of employment creation will be for the people who will take the opportunities presented to service the increased population and the population's amenities.

Through these three tiers the project will create employment for high-level staff, middle level staff and low level staff in line with all development policies in the country. Also through the third type and low level staff, the project will in advertently create jobs for locals since this has always been the case with projects of similar nature due to the fact that the locals are readily available and have the shortest access time to the site. It is also important to note that all these employees will be taxed and generate revenue for the taxman thereby contributing to more state implemented development projects.

c) Increased Access to Goods, Services and Social Amenities

The economic value of the project will increase access to quality goods and services that encompass those that will be provided by other attracted businesses. Also the green component created by the project will increase both the social benefits. This is psychologically linked to human wellbeing and productivity. This will stimulate other economic activities linked to these services and goods on top of improving the quality of life that is linked this access of goods and services.

d) Increased Economic Activities and Government Revenue

The project will also increase the economic activities that will be carried in the area through those that will be primarily as a result of: the project's internal and ancillary activities; its supply chain; its value chain, and those that will be formed as a result of the project to support its occupants. The latter includes businesses that may form around the project site such as shops, kiosks and transport. All these businesses activities will be taxed and generate revenue for the central government in addition to providing a market for their supply and value chains.

e) Stimulation to Urban Development

Cumulatively with other developments, the project will lead to turning the area from a lower tier urban area to at least a middle tier urban area. This has benefits of increasing the quality of life and revenue generation from increased activities. It is predicted that the project will increase the viability of the area to develop more residential areas and commercial establishments. Since, it will increase the market and labor available, and the socioeconomic status of the sub city and Addis Ababa city in general.

f) Population Increase

From the influx of labour and economic opportunities resultant of the project, the population of the region will be increased. This will be positive if the increase is sustainable on the basis of the opportunities and services available leading to the population being an increase in human and social capital as well as market for the various goods and services sold in the area.

g) Impetus to Improve Amenities and Services

An increase in population to the area will provide an impetus for the county council to improve the much needed amenities and infrastructure to the area. It will provide a stronger lobbing group. The influx will also provide an impetus to develop shared facilities i.e. schools, hospitals, shops. This will have the indirect effect of creating job opportunities in the area. Companies also in the business of providing services such as telecommunication will also be encouraged to extend their networks to the region since it will be a ready and capable market for their services.

6.3.1. 4 Decommissioning Phases

a) Creation of Employment and Business Opportunities

The decommissioning phase and its activities will create business for the contracting company that will be charged with pulling down the structure and transporting the resultant materials/debris. Additionally on shut down moving companies will also benefit from being contracted to move equipment and materials from the different businesses and residential units in the project. All these income streams will be taxed and generate income for the central government. Additionally the decommissioning activities will create employment and job opportunities for the different professionals involved in them. These include: engineers, demolition experts, landscaper and garners, foremen, supervisors, masons, truck drivers and crane operators amongst others.

b) Provision of Cheaper Building Materials

The decommission phase of the project will create recyclable building materials such as bricks, stones, metals, glass, wiring, furniture, electronics and water pumps, plumbing etc. which at present market trends will be cheaper than new materials. This will thus provide cheaper building material for future projects strategically increasing the productivity of the purposes the establishments in which they are used.

It is also possible that the materials may be donated and used for development projects (schools, hospitals etc.) in much needed areas. This will assist in promoting development where it's mostly needed and generally improve the quality of life in those areas and cumulatively in the country.

c) Income Generation

Decommissioning the project will create recyclable materials and equipment such as: stones, bricks, metals, furniture, switchboards, pumps etc. may be sold for income albeit cheaper than new ones they will generate taxable income for the proponent.

d) Environmental Conservation and Restoration

The recycling of the waste to be used as raw materials in other construction process reduces the demand for raw materials. This in turn reduces the potential impact to the environment that would have been felt if the demand of the raw materials hadn't reduced. For instance leaving the land derelict and destroying the habitat as a result of mining activities.

6.3.2 Negative Impacts

6.3.2.1 Construction Phases

During construction of the intended project, there are direct and indirect negative impacts supposed to influence the environment. It has influence on the flora and fauna, soil, hydrology, air, on the neighboring residence.

A) Loss of Flora and Fauna Habitats

Vegetation has a great effect on the general and localized environment and normally can modify microclimate. Usually, the flora creates a good environment for habitats thus the two may go together more often than not. In consequence, de-vegetation during construction may result to negative effects on the fauna by creating a disturbance.

The vegetation is important in as food and habitat for various animals. It also assists in maintaining the structure of the soil by holding the particles together. This enables the soil microorganisms to flourish as their habitat; the soil is stable. This in turn allows the organisms easily convert the dead leaves and plans to humus, which helps enrich the soil as well as preventing soil erosion. Converting the land area into a mostly built environment will minimize the natural process of the existing vegetation.

In the field assessment and design the consultant observed that the proponent formerly uses the plot of the construction site as hotel. There is no additional clearance of residence for the project purpose. In general the project does not have any significant negative impacts on the flora and fauna of the project. But it gone has a little impact by denying the host for the flora and fauna in the soil profile due to excavation and removal of the upper soil profile.

B) Changes in Surface and Sub-Surface Hydrology

Together with the loss of flora, changing the characteristics of the project site from its present state to a more built state (65-75% built) and changing the soil's characteristics, the proposed project will lead to a change in the water regime at the project site. This is because the built areas will increase run-off while reducing percolation of water into the ground and thereby also changing the sub-surface hydrology.

The wastes from the construction activities also pose a threat to the quality of water that will be drained from the site through run-off and this may pollute aquifers and river in the downstream.

C) Changes in Soil Characteristics

Several changes in the characteristics of the soil may result due to the excavation and compaction of soil for the foundation. The excavation may lead to losses in the accumulated soil carbon and this is known source of GHG's i.e. Carbondioxide (Co_2). Additively this excavation can also alter the soil's structural stability and reducing its structural integrity. Compacting the soil to lay the foundation, erecting temporary structures, and also from the heavy vehicles (trucks, tractors etc.) can reduce the soil's percolative ability and thereby increasing run-off either on the specific routes or large area. Together with the laying of foundation and erecting of ancillary structures, this will further lead to changes in surface and sub-surface hydrology by changing the flow and recharge rates at the project site.

D) Emission of Air Pollutants

The works involved in this phase of this project will also emit various air pollutants which can have both negative effects on both human and environmental health. One of these is dusts from the soil excavation, decommissioning of existing structures, carving of bricks and movement of trucks on loose top soil after the land has been cleared. Excavations and the use of cement and sand among other like- materials are bound to increase the dust and particle levels in the air around the development area. Such effects should be avoided through the use of dust screens. Workers at the site should also be provided with protective clothing to avoid negative health effects.

Also engines burning fossil fuels (vehicular and generators) will emit oxides of carbon, sulphur and nitrogen, and these also pose risks to human and environmental health on top some of them being GHG's such as (Carbondioxide,Co_2).

Welding operations will also emit gases and fumes such as Ozone(O_3), Chromium particularly in its hexavalent state ($Cr^{6+)}$, Nickel (potential carcinogens), cadmium and Lead 10(Pb-10), whilst others include: NO_X, No_2, O_2, Co_2, O_3 from mild and stainless steel welding (Matczak w. & Gromiec j., 2000). The health effects of exposure to these fumes can include irritation of the upper respiratory tract (nose and throat), tightness in the chest, wheezing, metal fume fever, lung

damage, bronchitis, pneumonia or emphysema. While particulate welding fume is usually fairly easy to see, gaseous fumes are invisible.

E) Generation of Noise

The construction activities and processes will also generate noise above the ambient levels of the area. one of the sources of this noise would be from the trucks' and tractor's engines moving in the area either undertaking the civil works or ferrying materials, wastes and equipment to and fro the project site and these will form the mobile sources of noise during this phase. Some point sources of noise will include civil works which will be operation specific or localized at the site due to the scope of the activities. This category of noise will include activities such as excavation, hammering, sawing, grinding; moving of material to and fro storage and also the use of generators.

One of the risks of the noise would be to the surrounding areas where they may create a nuisance or disturbance. Whereas at the site the loud noises pose a risk to the workers and site personnel since loud noises increase the risk of ear damage and deafness.

There will be an increase in the levels of noise in the construction site owing to the nature of machinery in use and the activities such as drilling and excavation. The normal levels of 55 decibels recommended by world health organization, (which) will be surpassed in the duration of the construction process. However this is a minor negative impact since the site area is largely an agricultural area with sparse residential settlement.

Table 4: Noise levels of some construction equipment

Equipment	Noise levels
Back hoe	85-95 db
Chain saw	110 d b
Front end loader	90-95 db
Jack hammer	112 db
Lawnmower	90 db
Tractor	95-105 db

Source:- Washington state department of labor and industries, 2012 .

F) Increased Pressure on Utilities

The processes and activities involved in the construction of the project would place added pressure on infrastructure services and utilities such as roads, water, drainage and energy. This may contribute to service disruptions since the utility and service requirements of this stage are intensive. This impact is made more probable due to the challenges faced in the county to provide these services and compounded by the growth of the population.

G) Increased Heavy Traffic

In this phase, the main roads leading to the site area will serve the additional vehicles used for the transportation of materials, equipment and staff to the site. The road is currently being upgraded highway and this will steer other developments in the area. Thus together with other developments the project will contribute to increasing the amount of heavy traffic plying the roads around it. Heavy trucks not have the risk of causing accidents due to their limited maneuverability but also place added pressure on the roads and can lead to failure (cracks and potholes). This is failure is however a combination of factors:- the total of trips of heavy trucks; the strength of the roads in context of carrying the heavy loads, and the resilience of the roads towards weathering.

The road in the project sites is partly gravel road and some way Asphalt. Therefore they will be most at risk of imposing some environmental problems such as air emission while the trucks carry construction material into the site and drive back by carrying soil and other excavated materials.

H) Population Influx

During the construction phase there will be an influx of people mainly working in the development. There will also be an increase of population due to the opportunities presented in providing goods and services to primary population increment for the construction activities and employees. This secondary increase will mainly entail retailers of foodstuffs and other commodities. The population will increase since the opportunities will be open to both local and people from other areas and thereby increasing the population.

This increase in population will create pressure on utilities as well as present social risks through the interaction of people. Also it may present a security risk since people with ill intentions may see an opportunity in the belongings of those attracted by the project for economic reasons.

I) Generation of Construction Waste

The construction phase will also lead to generation of construction wastes from the civil works and operations on the materials involved in the processes. these wastes include: plastics, metal shavings, wood shavings, food wastes, plants, gases (Carbon, Nitrous and Sulphurous Oxides), fumes (from glues and other Hydrocarbons), stone shavings, ceramics, bricks, glass, cardboard, soil, cement, asphalt, sand, concrete, paper, paints, sealants, adhesives, fasteners, construction effluent (grey water).

This phase will also lead to generation of waste heat through its run-off (water used for cooling) and the electric and diesel machines used in the construction activities. The waste heat can contribute cumulatively with other projects/activities in the area to change the microclimate, while waste heat in run-off can lead thermal pollution if it eventually drains into river.

This type of waste poses risks to both human and environmental health and thus the proposed project would require an adequate waste management strategy, occupational health and safety strategy, and hazardous material safety plan. Some environmental impacts would include soil contamination, water and air pollution, whereas health risks include: breathing complications and respiratory diseases, cancer, skin disorders, poisoning etc.

J) Occupational Health and Safety (OSH) Risks

Several OSH risks will occur from the activities, processes, materials and equipment involved in the construction phase of the project;

Table 5: OSH risks involved in the construction

OSH risk	Sources
Injuries or injurious substances, materials and equipment	• Moving parts of equipment e.g. saws, tractors, grinders etc. • moving heavy materials • open foundation pits • raised building materials and equipment e.g. bricks, saws, hammers, Steel pipes & fittings etc. sharp edges of nails, knives, saws, glass • Open flames, heat generating or using processes. • working at heights • emission of radiation i.e. EMFs from electrical equipment and bright lights from welding operations • corrosive chemicals
Fire	flammable liquids & gases, chemicals, electricity, welding, open flames, heated materials and heat producing processes such as grinding, burning fuels etc.
Intoxication	Toxic substances, corrosive chemicals, adhesives, waste gases, smoke, dusts and emitted particulate matter.

6.3.2.2 Operational Phase

A) Increased Pressure on Available Utilities

The expected increase in population and the needs of this population would place more pressure on infrastructure, utilities and social amenities in the area during the operational phase of the project. This may mainly be at the early stages of the project since they may not be capable to handle the extra demand created especially during rush hours. These services also encompass security as the project may attract people with different motives to the area.

Additionally the roads in the area will experience more traffic due this increased in population and this can cause more or increase the duration of traffic jams as well as increase the probability of traffic hazards.

B) Micro-Climate Modification

Though the project area is quite small to cause any considerable microclimate change it bears the potential of adding to cumulative effects of other infrastructural development that together emit GHGs. Change in land surface from natural vegetation to manmade built landscape will have an effect on the area microclimate by reducing the amount of evapotranspiration from the vegetation in the area which are also a GHG sink.

The microclimate will also be modified by the project activities that produce waste heat (emitted heat) and this will result in the area producing more heat than originally emitted without the project. Waste heat will be produced from vehicles, electronics, generators, water pump, air conditioning etc.

C) Increased Land Values and Land Use Changes

It is predicted that as a result of the project and other projects being carried out in the area the values of land in the area may increase at rates significantly more than normal. This is because the increase in population will increase demand for land and since its supply can't be increased, the value of land will increase. Also these projects will cumulatively turn the area into a more commercial and middle income region therefore pushing the value per acre in the region since more and more commercial establishments and higher value residential areas will be created out of opportunity.

This increase of land values and attraction of businesses to the area will cause land use changes in the region both in terms of uses of land (residential to commercial) and changing its character (vegetated areas to built-up areas). This will have impacts of loss of vegetation and emissions of GHG's on top of increasing the cost of living in the region, which may socially push the residents of the region further away if their econometric capacities are not improved in commensurate. It is important to note that the project in its self can't lead to this impact since it will only involve land use change at the site but its combination with other projects in the area can possibly cause this impact.

D) Increased Surface Run-Off

The paved surfaces and the project structures created from the construction phase of the project can lead to increased run-off by preventing the natural percolation of water through the soil. This

will also aggregate to the changes in the surface and subsurface hydrology as a result of the project.

Additionally the increased run-off may lead to soil erosion in the areas where the water drains off to or drainage blockages by overloading the present drainage systems in the area. The increased run-off from the project and other construction projects may also cumulatively cause urban flooding and inundation of low lying areas during the rainy season.

E) Socio-cultural Impacts

The proposed project will attract a mixed-use development and used as Five Star International Hotel building that will attract different Addis Ababa city residence and foreigners to the site. Social cohesion and blending with the existing communities may pose a conflict of interests in the short term since the influx population will come with their differing cultural and social practices. The locals may also be forced to move from the area if the land values increase and they end being bought out to pave way for more commercial developments that are predicted to occur in the region. Thus they would face a loss of social control and ownership to the region if this happens and economic segregation may occur on the basis of richer middle and upper class moving into the area and displacing the local lower class.

However this may be treated as a *minor impact* since most communities in Addis Ababa are welcoming and easy to interact with. Also since Addis Ababa is a predominantly urban and developed area that has a higher level of social permissiveness than most other urban areas in the country.

F) Increased Air Pollution

Cumulatively with other projects and activities carried out in the area the proposed project will emit pollutants to the air that present risks to human and ecosystem health. Table 6 below delineates some of the air pollutants expected from the project and the environmental and social aspects that they present a risk on.

Table 6: Operational phase air pollutants, their sources and risks

Pollutants	Sources	Risks
Co_2	Fossil fuel engines (vehicles, generators, water pumps etc.) cooking any burning activities e.g. welding	GHG and micro-climate modification acid run-off suffocation – poisonous in large quantities
Co	Fossil fuel engines (vehicles, generators, water pumps etc.) cooking any burning activities e.g. welding.	acid run-off suffocation – poisonous gas
SO_2	Fossil fuel engines (Vehicles, generators, water pumps etc.) welding	Acidified run-off GHG poisonous gas respiratory diseases and complications
NOx, Nx(g)	Fossil fuel engines (Vehicles, generators, water pumps etc.) welding	some forms are poisonous GHG –NO_2 smog respiratory illnesses and complications
Dusts and particulates (pm-10) heavy metals (Lead-Pb)	Fossil fuel engines (vehicles, generators, water pumps etc.) construction activities undertaken for O&M	heavy metals are poisonous when ingested respiratory diseases pollute rivers and underground water environmental haze

Source: Lisa Benton Short and John Rennie Short, 2008.

G) Increased Traffic

From the increased population; demand for goods and services, and ancillary project operations more vehicles will be plying the roads in the region around the project. This may lead to increased traffic jams and hazards in the area especially if the roads in the region are not upgraded to cater for this demand. This situation will be remedied by the completion of the upgrading of the existing road into a super highway since it will be able to carry part of the excess traffic since this is the intention of upgrading the road. however as a result of the project and other projects targeting the area, the area will experience an increase in traffic albeit intermittent, and this will increase the risk of traffic hazards since the probability of occurrence of the hazards will be increased by having more cars on the roads.

H) Generation of Waste

Several waste streams will be generated from the operational phase of the project and these have are delineated in Table 8 below alongside their sources and risks they present if not properly managed.

Table 8: Waste generations during operation

Waste	Sources	Risks
Municipal waste solid waste garbage, kitchen & office wastes	kitchen, rooms, garden, parking lot and repair works, plants, plastics (tubes, binders, wrappings, metals (from clips, pins, lids), paper, cloth etc.	water pollution, nuisances, air pollution on decomposition, soil contamination, water borne diseases, respiratory illnesses
Municipal waste liquid waste grey water, sewerage	kitchen, bath rooms, garages etc… from activities like washings, cooking oils, adhesives, fuel, chemicals, toilets, soaps and detergents	water pollution (surface & subsurface), air pollution, soil contamination, water borne diseases
Waste heat	electronics, vehicles, air conditioning, power generators, water pumps, cooking and heating activities (in house), cooling water for machines	thermal pollution of rivers from run- off microclimate modification

I) Occupational Health and Safety (OSH) Risks

Several OHS risks will also be created by either the activities, equipment and materials of the operational phase of the project, and these have been listed in table 9 below alongside their sources.

Table 9: Operational phase OHS risks

OHS risk	Sources
Injuries or injurious substances and equipment	• Slippery floors from washing with soaps and detergents, oil spills (both fuel and kitchen oil). • Parking barriers – can hit people passing below them. • Corrosive chemicals o working at heights • moving parts • vehicles and trucks • corrosive chemicals
Fire	fuel, electricity and electrical equipment that cause heat such as kettles, cookers both electric and or gas, and other electronics and machinery in the project
Intoxication	chemicals, soaps & detergents, adhesives, inks, fuels

Thus a plan to manage the OHS risks during this stage will also enable the proposed project will also be important and necessary. This plan may simply be an extension of the one developed for the construction phase and can be further extended to the decommissioning phase.

J) Generation of Noise

The activities of this phase of the project will also generate noise and these will be from various point sources such as if diesel generators without silencers are used and also any repair works that may be carried as necessitated by the project's operations. Mobile sources of noise will mainly include cars and the trucks that will be ferrying goods to the project. Although the noise levels emitted during this stage will be less than during the construction the impact will have more receptors since there will be more people in the area as a direct result of the project being operational.

6.3.2.3. Decommissioning phase

a) Generation of Noise

There will be a considerable increase in noise owing to the demolition process. This will be a short term impact and will be felt throughout the demolition process. The main sources of noise will include: cars and trucks; the civil works of pulling down the project's built structures

(especially of explosives are used), and mechanized equipment that will be used in the processes involved in this project phase.

b) Generation of demolition waste

The decommissioning phase of the project will create demolition wastes which share similar characteristic with construction wastes and therefore similar risks. The only two main differences are that:

(1) demolition waste can easily be accounted for before the empty building shell is pulled down, and

(2) if explosives are used they will form part of the waste.

Waste in form of debris and pieces of metal and wood will arise. Thus creating a need of disposing off of the waste and all the disadvantages associated with waste mismanagement will arise such as spread of diseases. it is hoped that this phase will be implemented only under unavoidable circumstances for instance aging of the building and/or pertinent rights arising.

c) Increased Heavy Traffic

For the processes of these phase materials from the buildings and equipment will have to be ferried to and fro the site through the use of trucks and tractors/bulldozers and these will increase the amount of heavy traffic in the area. although it is expected that at the time when the project will be decommissioned there will be substantial developments in infrastructure (transport), the trucks with limited maneuverability will pose a risk to the general public and other vehicles/drivers on top of placing extra pressure on the roads.

d) OHS risks

The decommissioning phase will have several OHS risks from the civil works involved, equipment, materials and processes. This may be added to if explosives are used and although their use is not known for now, an assessment has been made assuming or incorporating their use since they present a cost-effective way of demolition, which is safe when controlled. Table 10 that follows outlines the major OHS risks from this phase and their sources.

Table 10: Decommissioning phase OHS risks

OHS risk	Source
injuries or injurious substances and equipment	explosives (if used) ;falling debris ; moving parts of equipment such as mechanized saws and other cutting equipment
Fire	heat from gas cutters, friction from abrasive processes, fuel, electricity and electrical equipment
Intoxication	particulates, dusts from debris; fumes and gases emitted from friction & cutting processes, engines burning fossil fuels

e) Emission of Air Pollutants

The processes, material and equipment involved in this stage of the project and their wastes will also emit air pollutants either: as gases such as oxides of Carbon, Nitrogen and Sulphur from the burning of fossil fuels in engines, or particulate matter from cuttings and breakages of steel, glass, shavings, bricks and movement of soil. these will pollutants will pose risks to both human and environmental health such as air pollution, water pollution, soil contamination, respiratory diseases, skin disorders and irritations.

7. Mitigation Measures to Overcome the Adverse Impacts

The project's significant (high, moderate and some low) impacts are analyzed, reviewed further and mitigation measures are proposed as presented here under which will enable the impacts to be managed, reduced or avoided where possible.

The presentation is discussed in such a way which shows the likely impact and reference, the proposed mitigation measures and their residual impacts.

A. Construction Phase

i. Generation of construction waste
ii. OHS risks
iii. Generation of noise
iv. Increased pressure on utilities
v. Increased heavy traffic
vi. Loss of Flora and Faunal habitats
vii. Changes in surface and sub- surface hydrology
viii. Changes in soil characteristics
ix. Emissions of air pollutants
x. Population influx

7.1.Prosed Mitigation Measures in reply to the above problems

- ✓ During construction, the design (of the drainage system) should ensure that surface flow is drained suitably into the public drains provided to control flooding within the site.
- ✓ Clearing vegetation only in construction areas and demarcating areas where no clearing will happen.
- ✓ Landscaping with indigenous species on completion of construction. Maintaining of landscaped gardens, terraces, conservation and management of the vegetation and gardens.
- ✓ Drainage channels should be installed in all areas that generate or receive surface water such as car parking, driveways and along the building block-edges of the roofs.
- ✓ The channels should be covered with gratings or other suitable and approved materials to prevent occurrence of accidents and entry dirt that would compromise flow of run-off.
- ✓ The channels should be designed with regards to the peak volumes such as periods or seasons when there is high intensity of rainfall which is also not common in the project area but just in case such an event occurs.

- ✓ The drainage channels should ensure the safe final disposal of run-off /surface water and should be self-cleaning which means it should have a suitable gradient.
- ✓ They should never at any time be full due to the resulting heavy downpours.
- ✓ Storm water generated from roof catchments should be harvested, stored and made use in various household activities such as general cleaning. This will reduce run-off reaching the drainage channels.
- ✓ Paving of the side walkways, driveways and other open areas should be done using pervious materials such as cabro to encourage water recharge and reduce run-off volume.
- ✓ Sprinkling water on the soil to prevent dust from rising.
- ✓ Creating specific paths for the trucks Ensuring there is enough space for normal percolation of water.
- ✓ Preventing pollution from construction wastes by having specific sites for collection, sorting and transport of wastes.
- ✓ Proper installation and configuration of drainage structures to ensure their efficiency.
- ✓ Installing cascades to break the impact of water flowing into the drains. Controlling the earthworks and ensuring the management of excavation activities.
- ✓ Compacting areas with loose soil. Landscaping.
- ✓ Providing soil erosion control structures on the steeper areas of the site & controlling activities during the rainy season.
- ✓ Sprinkling water on soil before excavation and periodically when operations are under way to prevent raising of dusts.
- ✓ Enclosing the structures under construction with dust proof nets.
- ✓ Using efficient machines with low emission technologies for the ones that burn fossil fuels.
- ✓ Controlling the speed and operation of construction vehicles. Regular maintenance and services of machines and engines.
- ✓ Use of clean fuels e.g. unleaded and de-sulphurized fuels.
- ✓ Educate and raise awareness of construction workers on emission reduction techniques.
- ✓ Using equipment with noise suppressing technologies. Providing workers with PPEs against noise e.g. ear plugs.
- ✓ Placing signs around the site to notify people about the noisy conditions.
- ✓ Regular maintenance of equipment to ensure they remain efficient and effective.

- ✓ Complying with the noise regulation legal notice.
- ✓ Construction works should be carried out only during the specified time which is usually as from 0800 hrs to 1700 hrs.
- ✓ There should not be unnecessary horning of the involved machinery.
- ✓ Provision of bill boards at the construction site gates notifying of the construction activity and timings.
- ✓ Employing water conservation techniques and only using the required amounts of water to prevent wastage.
- ✓ Employing power saving techniques such as switching off equipment when not in use, using natural light whenever possible. Using machines with power saving technologies i.e. high efficiency equipment.
- ✓ Providing proper sanitary facilities for construction workers. Inspecting the drainage facilities regularly to ensure they are free of debris that may reduce their efficiency.
- ✓ Placing signs around the site notifying other vehicles about the heavy traffic and to set the speed limit around the site.
- ✓ Ensuring all drivers for the project comply to speed regulations.
- ✓ Making sure the construction doesn't occupy the road reserves and complying to traffic and land demarcation obligations.
- ✓ Ensuring all vehicles used for the project are in good working condition both legally and commensurate to their intended use.
- ✓ workers to be issued with jobs cards to monitor their movements in the site area
- ✓ only authorized personnel should be allowed entrance to the site
- ✓ presence of a work registry book where workers sign in and out educating the workers on proper sanitation methods
- ✓ Sensitizing the worker on HIV/AIDS
- ✓ Making available suitable facilities for the collection, segregation and safe disposal of the wastes.
- ✓ Ensuring all waste is dumped in their designated areas and legally acceptable methods.
- ✓ Following the country and Addis Ababa city regulations on waste management, legal notice.
- ✓ Employing a waste management plan.

- ✓ Using waste minimization techniques such as buying in bulk. Allocating responsibilities for waste management and identifying all sources of wastes, and ensuring wastes are handled by personnel licensed to do so.
- ✓ Making available suitable facilities for the collection, segregation and safe disposal of the wastes.
- ✓ Creating waste collection areas with clearly marked facilities such as colour coded bins and providing equipment for handling the wastes.
- ✓ Employing an OHS plan that will outline all OHS risks and provide a strategy for their management.
- ✓ Ensuring all potential hazards such as movable machine parts is labeled.
- ✓ Raising awareness and educating workers on risks from equipment and ensuring they receive adequate training on the use of the equipment.
- ✓ Providing the workers with adequate ppes and monitoring regularly to ensure they are replaced on time when they wear out.
- ✓ Placing visible and readable signs around where there are risks. Ensuring there is security in and around the site to control the movement of people.
- ✓ Providing safe and secure storage for equipment and materials in the site and maintaining MSDSs.
- ✓ Placing visible and readable signs to control the movement of vehicles and notify motorists and pedestrians around the, and workers in the site.
- ✓ Providing firefighting equipment and in easily accessible areas as well as ensuring site personnel are well trained to use them as well as maintaining them regularly.
- ✓ Labeling chemicals and material according to the risks they possess.
- ✓ Creating safe and adequate fire and emergency assembly points and making sure they are well labeled.
- ✓ Establishing emergency procedures against hazards and ensuring the workers stay aware/educated on following them and commensurate to the magnitude and type of emergency, by conducting regular drills and involving the neighbors. Etc.

Note that the residual impacts of all the above likely impact and references during Construction Phase are LOW.

B. Operational Phase

i. Increased pressure on available utilities
ii. Micro-climate modification
iii. Increased air pollution
iv. Increased surface runoff
v. Increased traffic
vi. Generation of waste
vii. OHS risks

7.2 The proposed mitigation measures for the likely impact & references as mentioned above are;

- Implementing water conservation techniques such as having faucets with dead man tap openers.
- Using only the required amounts of water during normal operations. Creating awareness through signs of conservation of water and electricity.
- Using natural light during the day for lighting purposes.
- Using machines and equipment with a high level of power efficiency in the residential houses and servicing them as often as required to maintain their efficiency.
- Using gas in the kitchens/restaurants for cooking purposes.
- Advocating for the use of other renewable sources of energy such as solar energy/heater use of clean fuels e.g. unleaded and de-sulphurized fuels in vehicles.
- Paving should only be carried out where necessary to reduce the reflection of the solar radiations.
- Landscaping the site with indigenous species/trees and ornamentals of plants using sustainable drainage systems that mimic the natural percolation of water into the soil, and green roofs where possible using efficient equipment that emit little or no waste heat.
- Install scrubbers in the exhausts of motor vehicles to filter the toxic fumes.
- Use of clean fuels such as solar and wind energy sources.
- Use of de -sulphurized and unleaded fuels in vehicles.
- Banning the burning of wastes and other materials at the site.
- Using efficient equipment, machines and engines that emit less pollutants.
- Using materials that mimic natural percolation of water. Landscaping to ensure there are areas where water will percolate underground.

- Constructing proper drains and monitoring them to ensure there are no blockages.
- This also includes ensuring the size of the drains can accommodate storm flows during the rainy season.
- Erecting visible and clear signs to control the movement of vehicles in and out of the site.
- Having alternative entrances and exits for emergency operations.
- Placing signs around the site notifying other vehicles about the heavy traffic and to set the speed limit around the site.
- Ensuring all drivers for the project comply to traffic regulations making sure the construction doesn't occupy the road reserves and complying to traffic and land demarcation obligations.
- Ensuring all vehicles used for the project are in good working condition both legally and commensurate to their intended use.
- Developing and implementing a waste management plan. Following the Federal and Addis Ababa city adminstration regulations on waste management, legal notice 121.
- Using waste minimization techniques such as buying in bulk, buying pre-processed foods in the restaurants etc.
- Allocating responsibilities for waste management and identifying all sources of wastes, and ensuring wastes are handled by personnel licensed to do so.
- Making available suitable facilities for the collection, segregation and safe disposal of the wastes.
- Creating waste collection areas with clearly marked facilities such as colour coded bins and providing equipment for handling the wastes.
- The bins should be coded for plastics, rubber, organics, glass, paper, electrical equipment etc.
- Ensuring all wastes are dumped in their designated areas and through legally acceptable methods and that the bins are regularly cleaned and disinfected.
- Assessing and creating opportunities for regulation, reducing, reusing, recycling, recovering, rethinking and renovation. Creating adequate facilities for the storage of materials and chemicals and controlling access to these facilities.
- Ensuring bins are protected from rain and animals.
- Employing and EHS/OHS plan.

- Provision of PPES to all personnel working in potentially hazardous areas or with potentially hazardous equipment, and replacing the PPES on wear and tear.
- Placing readable signs alerting people of hazardous such as for slippery floors.
- Servicing equipment and machine to ensure efficiency.
- Providing firefighting equipment and maintaining them to ensure they are fully functional.
- Delineating fire and emergency assembly points and creating awareness to ensure all people at site are aware of them, E.g. through the use maps on elevators, staircases etc.
- Putting in place and ERP and ensuring all people in the project are aware of it and the procedures to follow commensurate to the level of emergency.
- Providing adequate storage for hazardous and flammable substances and controlling access to them.
- Monitoring the movement, handling and management of wastes to ensure they safely managed and don't present any EHS risks. Working state agencies in the management of emergencies and disasters to ensure multilateral and inter-sectoral approaches to this management.
- Performing emergency drills on a frequent basis, setting benchmarks for response and evaluating performance to ensure continuous improvement of response and preparedness.
- Erecting signs and notifying other users of noisy activities. Conducting all noisy activities during the day when permissible levels are higher.
- Provision of PPES such as ear plugs for employees working in noisy conditions or with noisy equipment.
- Using equipment with low noise ratings or noise reduction technologies such as for the generators.

Note that the residual impacts of all the above likely impact and references during operational Phase are LOW.

8. Analysis of Project Alternatives

The consideration of alternatives to a proposal is a requirement of many EIA systems. A comparison of alternatives will help to determine the best method of achieving project objectives while minimizing environmental impacts or, more creatively, indicate the most environmentally friendly or best practicable environmental option.

From an environmental perspective, not carrying out this development may be the best option. Without the development, the area would remain a relatively undisturbed area providing a habitat for the varied flora and fauna presently observed. This area will continue to be impacted, although minimally, by anthropogenic and natural factors. From a socio-economic perspective the "no action" alternative may not be the best alternative as the numerous benefits to be gained from the development both locally and nationally would not be realized and the resources in the area would continue to be underutilized.

In order to enable the proposed project to seek different ways of minimizing its impacts on the environment and at the same time achieve its objectives several alternatives were assessed through its architectural and engineering designs and environmental planning through this EIA. This not only justifies the course of action (base case) but also enables the risk management to follow a hierarchy of:

8.1 Site Option

This option involves pursuing the proposal but on a different site meaning its impacts that are relevant to the proposed site or occur due it will be avoided. The avoidance of these *in-situ* and *ex-situ* regional impacts would be the main benefit of this option but there will also be other impacts specific to the alternative site and due to specifications of the proposed project, a different site away from the current plot would also increase logistic costs. Alternative sites are also not readily available since availability of land in urban areas is low.

8.2 Schedule Alternative

This option entails carrying out the proposal at a later time thereby offsetting its impacts to that time. Only benefit is if there improvements in baseline conditions and technologies that may be involved with the proposal. However these are not guaranteed and it may only lead delays in development, therefore carrying out the proposed project with mitigation would be a preferred option due to this uncertainty. in addition carrying out the proposed project at later time may lead to more operational and logistic costs due to increasing inflation and standards of living.

8.3 Designs Alternative

This option curtails undertaking the project but with different infrastructural designs that encompass: buildings, roads, power, water and sewerage. The presented project design was however achieved by considering the options available that would ensure cost-effectiveness and avoid or reduce environmental and social impacts as much as possible.

8.4 Alternative Inputs

Alternatively the project may use different combinations of inputs such as: transport systems; water; electric power, and sewerage. This may reduce the project's impacts in several cases but as compared to the project's preferred options for these services they may result in extensive costs and bottlenecks since several of these options/inputs are at a techno-commercial infancy stage and have a varying set of impacts.

8.5 Utilities

a) Water

There are two alternative water sources against the municipality. The rainwater harvesting and the recycled sewerage waste water. The rainwater option is accepted and have been practices across the nation to use for construction, thus as confirmed during the interview with the owner, they are going to use for the construction activities. But the option of utilizing the recycling of wastewater incurs huge additional cost for the proponents. Therefore, utilizing the rainwater harvesting together with the municipality in effective and efficiently is the available option and

can reduce the burden of the municipal water demand for the normal resident and to the environment.

B) Electricity

Alternative energy like wind, biogas and solar facilities are potential source of alternative energy. But these technologies are not widely spread and easily accessible in the country. The only option is the governmental grid electric system distributed and managed by Ethiopian Electric Utility (EEU). Since this source is from hydropower, the efficient utilization of this sources of energy is has less environmental impact.

C) Transport

Apart from the proposed access modes of having one access from main road and another project has the alternative of only using one road access. This alternative has the disadvantage of increasing the traffic load around the project site, whereas the preferred option has the advantage of minimizing this load and increasing access to the site by decentralization. However the preferred alternative has a disadvantage of increasing traffic loads in the inter neighborhood roads in the region adjacent to the project, which will be adequately managed by constructing quality roads; following traffic laws and erecting the appropriate signage.

D) Materials

All the materials including the timber is purchasing locally. The option of utilizing the timber is bad for the environment, but the metal pillars are not available in the country, importing are expensive and incurs a lot of additional construction cost on the proponents. The alternative of utilizing the local materials contributes for the economy of the country by providing the business opportunity for the local suppliers. The waste of the timber will use for firewood by the poor.

E) No Project Option

This alternative means forfeiting the proposed development avoiding all its impact both positive and negative. The only benefit of this option would be negative impacts would be avoided such as losses in flora & faunal habitats, waste generation and pressure on infrastructure. However positive gains from the project on the economy would also be lost such as employment creation,

revenue generation, tourism development, capital injection into the economy and infrastructure developments that may result from the project.

8.6. Emergency Preparedness & Responding Management

One of the issues of Environmental management is Emergency Preparedness and Responding Management. It means that the proponent company must have readiness in case emergency situation arouse and the response system. One case might be uncontrolled situation such as fire hazard, chemical explosion, physical contamination etc. Towards those hazards, the proponent is expected to be highly equipped with safety measures and hazard from the aforementioned response system. Thus, it is safe to say that the proponent has all the early preparedness and emergency handling system and ready for triggering better hazard minimization and responding system such like the one used in the advanced world.

8.7 Record Management, Reporting and Corrective Actions

On the table that shows Environmental Management Plan, it can be depicted that all the Environmental management and feedback mechanism as well as response system is assumed to be handled by an assigned Focal Person. In related with, the same person will take care of supervising the processes including pre-construction phases up to the building official inaugurations. Thus, those processes demand observing and recording of all the processes, timely responding and taking corrective actions where appropriate. Therefore, the proponent has a plan to handle those issues and facilitate systems of production which will comply with the requirements of all sectors which are concerned with the construction industry.

9. Environmental Management Plan (EMP) and Environmental Audit

9.1 Introduction

This Environmental Management Plan (EMP) is aimed at mitigating the possible adverse impact of the project and ensuring the maintenance of the existing environmental quality. The EMP covers planning, construction and implementation of the project, which have a direct consequence on the environment. It is essential to implement the EMP right from the planning stage and then continue the task throughout the construction and operation phase.

On the other hand, the Environmental Monitoring Plan's main objective is to identify the project specific activities that would have to be considered for investigation of the significant adverse impacts and the mitigation measures required. The impacts due to development works construction will be first minimized by adequate planning and construction activities as per the Federal and Regional Laws of the country.

Regular monitoring of all significant environmental parameters is essential to check the compliance status vis-à-vis the environmental laws and regulation of the country. The detailed objectives of the monitoring entails:

- To verify the results of the impact assessment study with respect to the proposed projects.
- To study the trend of concentrated values of the parameters, which have been identified as critical and properly planning the mitigating measures.
- To assess and control emission.
- To ensure that any additional parameters, other than those identified in the impact, do not turn critical after the implementation of the project.

9.2 Environmental Management Plan

In the context of a project, environmental management is concerned with implementation of the 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,

environmental 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 and constructed and functions efficiently throughout its life.

Both project management and environmental management responsibilities are normally shared between several government and non-government organizations, each with specific executive responsibilities for particular aspects, which are exercised during the various stages of project preparation, implementation and subsequent operation and maintenance. In the following section major socio-environmental management activities and responsible bodies for the execution of these activities are described.

9.2.1 Pre-Construction Phase

Prior to the promoters' mobilization and the commencement of the planned work, environmental management will be concerned with the following major areas of activities:

- Ensuring that all government and the project promoter's requirements and procedures relating to EIA are complied with;
- Preparation of detailed designs which incorporate specific features aimed at minimizing adverse impacts and enhancing beneficial impacts;
- Preparation of tender or short listing well experienced Five Star Hotel design specialist(s) and construction contract documents which contain appropriate clauses to allow control of negative impacts arising from construction activities;
- Review and evaluation of the EIA is expected to be the responsibility of Environment, Forest and Climate Change Commission Concerned Office.

Table 11: Environmental and Social Management Plan (ESMP)

Impact	Mitigation Measures	Responsible Body	Cost	Indicators	Time/Frequency
Construction Phase					
Loss of flora and fauna habitats	Landscaping with indigenous species on completion of construction. Maintaining of landscaped gardens, terraces, conservation and management of the vegetation and gardens. Clearing vegetation only in construction areas and demarcating areas where no clearing will happen.	project proponent, city council, contractor	5,000	% of paved area to vegetated area	once
Impacts in surface and sub- surface hydrology	During construction, the design (of the drainage system) should ensure that surface flow is drained suitably into the public drains provided to control flooding within the site. Drainage channels should be installed in all areas that generate or receive surface water such as car parking, driveways and along the building block-edges of the roofs. The channels should be covered with gratings or other suitable and approved materials to prevent occurrence of accidents and entry dirt that would compromise flow of run-off. The channels should be designed with regards to the peak volumes such as periods or seasons when there is high intensity of rainfall which is also not common in the project area but just in case such an event occurs. They should never at any time be full due to the resulting heavy downpours. The drainage channels should ensure the safe final disposal of run-off /surface water and should be self-cleaning which means it should have a suitable gradient. Storm water generated from roof catchments should be harvested, stored and made use in various household activities such as general cleaning. This will reduce run-off reaching the drainage channels. paving of the side walkways, driveways and	project proponent and project manager	10,000	presence of drainage channels % of paved area	

	other open areas should be done using pervious materials such as cabro to encourage water recharge and reduce run- off volume				
Changing soil characteristics	Sprinkling water on the soil to prevent dust from rising. Creating specific paths for the trucks ensuring there is enough space for normal percolation of water. Preventing pollution from construction wastes by having specific sites for collection, sorting and transport of wastes. Proper installation and configuration of drainage structures to ensure their efficiency. Installing cascades to break the impact of water flowing into the drains. Controlling the earthworks and ensuring the management of excavation activities. Compacting areas with loose soil. Landscaping. Providing soil erosion control structures on the steeper areas of the site & controlling activities during the rainy season.	Contractor, – site foreman, project proponent	20,000	Amount of dust per volume of air. % of paved area to vegetated area. amount of run-off i.e. flow rate of run-off in m3/s amount of soil in run-off or drained water – kg/m3	weekly once daily daily
Emissions of air pollutants	Sprinkling water on soil before excavation and periodically when operations are under way to prevent raising of dusts. enclosing the structures under construction With dust proof nets. Using efficient machines with low emission technologies for the ones that burn fossil fuels. Controlling the speed and operation of construction vehicles. Regular maintenance and services of machines and engines. Use of clean fuels e.g. unleaded and de- sulphurized fuels. Educate and raise awareness of construction workers on emission reduction techniques.	project proponent, contractor	15,000	Amount of gaseous emissions per day: ppm in air per day Amount of particulate emission per day: ppm in air per day	monthly monthly
Generation of noise	Technologies. Providing workers with PPES against noise e.g. ear plugs. Placing signs around the site to notify people about the noisy conditions. Using equipment with noise suppressing regular maintenance of equipment to ensure they remain efficient	project manager and proponent project	15,000	quality of PPES (ear muffs, ear plugs) Amount of noise generated: db	daily daily

	and effective. Complying with the EMA noise regulation legal notice 61. Project proponent contractor workers working in noisy conditions or with noise generating equipment member of the public construction works should be carried out only during the specified time which is usually as from 0800 hrs to 1700 hrs. There should not be unnecessary horning of the involved machinery. provision of bill boards at the construction site gates notifying of the construction activity and timings				
Increase pressure on utilities	Employing water conservation techniques and only using the required amounts of water to prevent wastage. Employing power saving techniques such as switching off equipment when not in use, using natural light whenever possible. Using machines with power saving technologies i.e. high efficiency equipment. Providing proper sanitary facilities for construction workers. Inspecting the drainage facilities regularly to ensure they are free of debris that may reduce their efficiency.	project proponent contractor city council members of the public ministry of Addis Ababa city metropolitan development	within project costs 30,000	amount of water consumed per day: m3/day amount of electricity consumed per day: kwh number of machines and equipment serviced per month and amount of fuel consumed per day: m3/day, number of drainage blockages per month	daily daily monthly daily
Increase heavy traffic	Placing signs around the site notifying other vehicles about the heavy traffic and to set the speed limit around the site. Ensuring all drivers for the project comply to speed regulations. Making sure the construction doesn't occupy the road reserves and complying to traffic and land demarcation obligations. ensuring all vehicles used for the project are in good working condition both legally and	project proponent contractor truck drivers members of the public city council traffic police of Addis Ababa ministry of Addis Ababa metropolitan development	3,000	presence of a work registry book issuing of job cards presence of sanitary services amount of waste	per day i.e. kg/day per specific waste type

	commensurate to their intended use			generated	
Generation of construction waste	Following EMCA regulations on waste management, legal notice 121. Employing a waste management plan. Using waste minimization techniques such as buying in bulk. Allocating responsibilities for waste management and identifying all sources of wastes, and ensuring wastes are handled by personnel licensed to do so. Making available suitable facilities for the collection, segregation and safe disposal of the wastes. Creating waste collection areas with clearly marked facilities such as colour coded bins and providing equipment for handling the wastes. The bins should be coded for plastics, rubber, organics, glass, timber, metals etc. Ensuring all wastes are dumped in their designated areas and through legally acceptable methods and that the bins are regularly cleaned and disinfected. Assessing and creating opportunities for regulation, reducing, reusing, recycling, recovering, rethinking and renovation. Creating adequate facilities for the storage of building materials and chemicals and controlling access to these facilities. Ensuring bins are protected from rain and animals.	project proponent contractor, members of the public district public health office	35,000	Amount of wastes generated per day i.e. kg/day per specific waste type. quality of ppes Quality and capacity of waste management equipment (bins, signs, ppes etc.)	daily and often as possible daily and often as possible
OSH risks	Employing an OSH plan that will outline all OSH risks and provide a strategy for their management. (see appendices 7 & 8) ensuring all potential hazards such as movable machine parts are labeled. Raising awareness and educating workers on risks from equipment and ensuring they receive adequate training on the use of the equipment. Providing the workers with adequate ppes and monitoring regularly to ensure they are		20,000	number of incidents/accidents per monthly quality of all ppes number of drills per quarter	weekly daily and as often as possible quarterly

	replaced on time when they wear out. Placing visible and readable signs around where there are risks. Ensuring there is security in and around the site to control the movement of people. Providing safe and secure storage for equipment and materials in the site and maintaining MSDSS. Placing visible and readable signs to control the movement of vehicles and notify motorists and pedestrians around the, and workers in the site. Providing firefighting equipment and in easily accessible areas as well as ensuring site personnel are well trained to use them as well as maintaining them regularly. Labeling chemicals and material according to the risks they possess. Creating safe and adequate fire and emergency assembly points and making sure they are well labeled. establishing Emergency procedures against hazards and ensuring the workers stay aware/educated on following them and commensurate to the magnitude and type of emergency, by conducting regular drills and involving the neighbors.			effectiveness of drills visibility and clarity of signs and alerts efficiency of equipment such as firefighting equipment quality and efficacy of storage level of awareness of workers number of assembly points	after every drill daily and spot checks weekly and spot checks daily and spot checks quarterly and spot checks
Operational Phase					

Increased pressure on available utilities	Implementing water conservation techniques such as having faucets with dead man tap openers. Using only the required amounts of water during normal operations. Creating awareness through signs of conservation of water and electricity. Using natural light during the day for lighting purposes. Using machines and equipment with a high level of power efficiency in the offices and residential houses and servicing them as often as required to maintain their efficiency. Using gas in the kitchens/restaurants for cooking purposes.	proponent city council project staff and office staff members of the public ministry of Addis Ababa metropolitan development project occupiers (residents and business people	15,000	amount of water consumed per day: m3/day amount of electricity consumed per day: kwh number of machines and equipment serviced per month amount of fuel consumed per day: m^3/day	daily monthly
Increase land values and Land use changes	Complying to zoning bylaws collaborating with Public and planning officials on the development and future developments aligning the project's objectives with those of national, county and district development policies	Proponent, Ministry of housing ministry of Addis Ababa ,metropolitan development ministry of planning	1.000	birr per acre ratio of new settlers to host community land use balance trend	half-yearly
Micro-climate modification	Advocating for the use of other renewable sources of energy such as wind and solar energy use of clean fuels e.g. unleaded and de- sulphurized fuels in vehicles. Paving should only be carried out where necessary to reduce the reflection of the solar radiations. landscaping the site with indigenous species of plants using sustainable drainage systems that mimic the natural percolation of water into the soil, and green roofs where possible using efficient equipment that emit little or no waste heat	project proponent contractors project occupiers (residents and business people)	20,000	numbers of trees planted ratio of paved surface to unpaved surfaces	yearly half-yearly
Socio-cultural impacts	Integrating equal opportunity principles in Procurement and human resource policies. Promoting social cohesion and integration	proponent project staff ministry of labour project occupiers (residents and business	30,000	staff diversity ratios number of discrimination	quarterly quarterly

	among people in the area. Creating awareness towards the diversity of cultures and different economic background of the people in the project staff and residents through sensitization. Allowing the residents and businesses to form social groups and networks that build social capital. Targeting social investment programs towards the local communities and region	people) members of the public ministry of gender and youth affairs ministry of justice, national cohesion and constitutional affairs		incidences and reports number of social groups number of social investment strategies targeted at the local community level of integration of cultural appreciation into staff training programs	Every time training is held and reviewed.
Increase air pollution	Install scrubbers in the exhausts of motor vehicles to filter the toxic fumes use of clean fuels such as solar and wind energy sources use of de -sulphurized and unleaded fuels in vehicles. Banning the burning of wastes and other materials at the site. using efficient equipment, machines and engines that emit less pollutants	Proponent, contractors project staff project occupiers (residents and business people) member of the public area OSH officer area public health officer		efficacy of equipment and machinery amount of gaseous emissions per day: ppm in air per day or amount of particulate emission per day: ppm in air per day	weekly and on procurement bi-weekly bi-weekly

Increased surface runoff	Percolation of water. Landscaping to ensure there are areas where water will percolate underground. Constructing proper drains and monitoring them to ensure there are no blockages. This also includes ensuring the size of the drains can accommodate storm flows during the rainy season.	proponent contractor city council, project occupiers (residents and business people) members of the public	1,000	drainage flow rate: m3/day ratio of paved areas to vegetated areas number of drainage blockages	daily quarterly quarterly
Increased traffic	Erecting visible and clear signs to control The movement of vehicles in and out of the site. Having alternative entrances and exits for emergency operations. Placing signs around the site notifying other vehicles about the heavy traffic and to set the speed limit around the site. ensuring all drivers for the project comply to traffic regulations Making sure the construction doesn't occupy the road reserves and complying to traffic and land demarcation obligations. Ensuring all vehicles used for the project are in good working condition both legally and commensurate to their intended use.	proponent city council traffic police project staff and office staff members of the public, project occupiers (residents and business people)	3,000	number of traffic jams per day duration of traffic jams: hours number of traffic incidents and accidents per month	daily daily monthly
Generation of waste	Development and implementation of management plan following regulations on waste management, legal notice 2006. Using waste minimization techniques such as buying in bulk, buying pre-processed foods in the restaurants etc. Allocating responsibilities for waste management and identifying all sources of wastes, and ensuring wastes are handled by personnel licensed to do so. Making available suitable facilities for the collection, segregation and safe disposal of the wastes. Creating waste collection areas with clearly marked facilities such as colour	proponent project maintenance staff city council integrated solid waste management agency, area OSH officer Sub city and Woreda public health officer project occupiers (residents and business people)	20,000	amount of waste generated per day per waste type: kg/day Adequacy/quality of waste management equipment (bins, ppes such as gloves, boots etc.)	daily weekly daily

	coded bins and providing equipment for handling the wastes. The bins should be coded for plastics, rubber, organics, glass, paper, electrical equipment etc. Ensuring all wastes are dumped in their designated areas and through legally acceptable methods and that the bins are regularly cleaned and disinfected. Assessing and creating opportunities for regulation, reducing, reusing, recycling, recovering, rethinking and renovation. Creating adequate facilities for the storage of materials and chemicals and controlling access to these facilities. Ensuring bins are protected from rain and animals.			visibility and clarity of notices and signs	
OSH risks	Employing and EHS/OSH plan. Provision of PPES to all personnel working in potentially hazardous areas or with potentially hazardous equipment, and replacing the PPES on wear and tear. Placing readable signs alerting people of hazardous such as for slippery floors. Servicing equipment and machine to ensure efficiency. Providing fire fighting equipment and maintaining them to ensure they are fully functional. Delineating fire and emergency assembly points and creating awareness to ensure all people at site are aware of them, e.g. through the use maps on elevators, staircases etc. putting in place and ERP and ensuring all people in the project are aware of it and the procedures to follow commensurate to the level of emergency. Providing adequate storage for hazardous and flammable substances and controlling access to them. Monitoring the movement, handling and management of wastes to ensure they safely managed and don't present any EHS risks.	Proponent city council traffic police area OSH officer project staff project occupiers (residents and businesses) members of the public district public health officer	12,000	number of incidents/accidents per monthly quality of all ppes number of drills per quarter effectiveness of drills visibility and clarity of signs and alerts efficiency of equipment such as fire fighting equipment	weekly daily and as often as possible quarterly after every drill daily and spot checks weekly daily and spot check Quarterly once

	Working state agencies in the management of emergencies and disasters to ensure multilateral and inter-sectoral approaches to this management. Performing emergency drills on a frequent basis, setting benchmarks for response and evaluating performance to ensure continuous improvement of response and preparedness.			Quality and efficiency of storage level of awareness of workers number of assembly points	
Generation of waste	Erecting signs and notifying other users of noisy activities. Conducting all noisy activities during the day when permissible levels are higher. Provision of PPES such as ear plugs for employees working in noisy conditions or with noisy equipment. Using equipment with low noise ratings or noise reduction technologies such as for the generators	Proponent, project maintenance staff office and OSH officer members of the public workers working in noisy conditions or with noisy equipment	5,000	visibility and clarity of signs amount of noise generated per day: db adequacy and quality of noise ppes (ear muff, ear plugs)	daily or as often as necessary
Decommissioning Phase					
Generation of noise	Carrying out the decommissioning works only during the specified time from 0800hrs to 1700hrs where permissible levels of noise are high and acceptable. Machineries should be maintained regularly to reduce noise resulting from friction. Providing workers with personal protective equipment such as earmuffs when operating noisy machinery and when in a noisy environment. Provision of bill boards at the construction site gates notifying people of the activities and timings. Shielding the area to reduce noise propagation	proponent project maintenance staff office and hotel staff area OSH officer members of the public workers working in noisy conditions or with noisy equipment/machines	3,000	quality of PPES (ear muffs, ear plugs) amount of noise generated: db	daily and as often as possible daily
Generation of demolition waste	Following regulations on waste management, legal notice 2006. Employing a waste management plan, which will involve assessing and creating opportunities for regulation, reducing, reusing, recycling, recovering, rethinking and renovation. Removing reusable and recyclable material	Demolition contractor project proponent, city council members of the public area OSH officer district public health officer	within project costs	Amount of wastes generated per day i.e. kg/day per specific waste type.	daily daily and as often as

	from the building before demolition to minimize the amount of waste. Allocating responsibilities for waste management and identifying all sources of wastes, and ensuring wastes are handled By personnel licensed to do so. Making available suitable facilities for the collection, segregation and safe disposal of the wastes. Ensuring all wastes are dumped in their designated areas and through legally acceptable methods			Quality of PPES Quality and capacity of waste management equipment (bins, signs, ppes etc.)	possible daily
Increased Heavy traffic	Placing signs around the site notifying other vehicles about the heavy traffic and to set the speed limit around the site. Ensuring all drivers for the project comply to speed regulations. Making sure the construction doesn't occupy the road reserves and complying to traffic and land demarcation obligations. Ensuring all vehicles used for the project are in good working condition both legally and commensurate to their intended use.	Demolition contractor project proponent , Addis Ababa city council members of the public traffic police area OSH officer	within project costs	quality of the signs number of incidents per month complaints per month	Daily and as often as possible. Monthly monthly
OSH risks	employing an OSH plan that will outline all OSH risks and provide a strategy for their Management. Ensuring all hazards such as movable parts are abeled. Raising awareness and educating workers on risks from equipment and ensuring they receive adequate training on the use of the equipment. Providing the workers with adequate PPES and monitoring regularly to ensure they are replaced on time when they wear out. Placing visible and readable signs around where there are risks and undertaking the riskier demolition activities first and in isolation. Ensuring there is security in and around the site to control the movement of people providing safe and secure storage for the waste and materials in the site. Placing visible and readable signs to control the	Demolition contractor project proponent , area OSH officer project security firm members of the public	within the project cost	number of incidents/accidents per monthly quality of all PPES visibility and clarity of signs and alerts efficiency of equipment such as fire fighting equipment	monthly daily and as often as possible daily and as often as possible weekly and as often as possible weekly and spot checks bi-weekly and spot

	movement of vehicles and notify motorists and pedestrians around the, and workers in the site. Providing firefighting equipment and in easily accessible areas as well as ensuring site personnel are well trained to use them as well as maintaining them regularly. Abeled chemicals and materials according to the risks they possess. Creating safe and adequate fire and emergency assembly points and making sure they are well labeled. Establishing emergency procedures against hazards and ensuring the workers stay aware/educated on following them and commensurate to the magnitude and type of emergency, by conducting regular drills and involving the neighbors.			quality and efficiency of storage level of awareness of workers number of assembly points	checks
Emission of air pollutant	Using efficient equipment and machines with efficient engines meaning low Emission using clean fuels such de-sulphurized diesel and unleaded fuels. Using dust screens. Removing components with potential of emitting hazardous gases or particulates separately and under caution to prevent emissions.	Demolition contractor project proponent city council members of the public district public health officer area OSH officer	within the project cost	amount of gaseous emissions per day: ppm in air per day Amount of particulate emission per day: ppm in air per day	daily Daily
Total Cost (In Birr)			**263,000**		

9.3 Environmental Audit

Literally, Environmental Impact Assessment and Environmental Monitoring Plan demand auditing after they are enforced into action. In related with this, the client organization reflected what to do in the course of the production among which Environmental Auditing is the major one.

Environmental Auditing is supposed to be in place at least once in three months or quarterly basis by the assigned personnel for this particular purpose. Thus, the proponent is supposed to undertake the auditing on its production system starting from pre-construction to post construction phase in turn the necessary report will be prepared and submitted to the proponent organization in timely basis.

Table 12: Environmental Monitoring Plan

Mitigation Measure	Indicators	Responsible Body	Means of Verification	Time	Cost
Landscaping with indigenous species on completion of construction. Maintaining of landscaped gardens, terraces, conservation and management of the vegetation and gardens. Clearing vegetation only in construction areas and demarcating areas where no clearing will happen.	% of paved area to vegetated area	project proponent, city council, contractor	Inspection report	once	**10,000**
During construction, the design (of the drainage system) should ensure that surface flow is drained suitably into the public drains provided to control flooding within the site. Drainage channels should be installed in all areas The drainage channels should ensure the safe final disposal of run-off /surface water and should be self-cleaning which means it should have a suitable gradient. Storm water generated from roof catchments should be harvested, stored and made use in various household	presence of drainage channels % of paved area	project proponent and project manager			**10,000**
Sprinkling water on the soil to prevent dust from rising. Creating specific paths for the trucks Preventing pollution from construction wastes by having specific sites for collection, sorting and transport of wastes. Proper installation and configuration of drainage structures to ensure their efficiency. Compacting areas with loose soil. Landscaping. Providing soil erosion control structures on the steeper areas of the site & controlling activities during the rainy season.	Amount of dust per volume of air. % of paved area to vegetated area. amount of run-off i.e. flow rate of run-off in m3/s amount of soil in run-off or drained water – kg/m^3	Contractor, – site foreman, project proponent	Inspection report	weekly once daily daily	10**,000**
Sprinkling water on soil before excavation and periodically Using efficient machines with low emission technologies. Controlling the speed and operation of construction vehicles. Regular maintenance and services of machines and engines.	amount of gaseous emissions per day: ppm in air per day amount of particulate	project proponent, contractor	Inspection report	monthly monthly	**15,000**

Use of clean fuels. Educate and raise awareness of construction workers on emission reduction techniques.	emission per day: ppm in air per day				
Employing water conservation techniques Employing power saving techniques Using machines with power saving technologies Providing proper sanitary facilities for construction workers. Inspecting the drainage facilities regularly	amount of water consumed per day: m3/day amount of electricity consumed per day: kwh number of machines and equipment	project proponent, contractor city council members of the public	Inventories and inspection report	daily monthly daily	**10,000**
Following EMCA regulations on waste management, legal notice 121. Employing a waste management plan. Using waste minimization techniques such as buying in bulk. Making available suitable facilities for the collection, segregation and safe disposal of the wastes. Ensuring all wastes are dumped in their designated areas	Amount of wastes generated per day i.e. kg/day per specific waste type. quality of PPEs	project proponent contractor, members of the public district public health office	Survey and inspection report	daily and often as possible daily and often as possible	**10,000**
employing an OSH plan that will outline all OSH risks and provide a strategy for their Management. ensuring all hazards, educating workers Providing the workers with adequate PPES and monitoring Placing visible and readable signs Ensuring there is security in and around the site to control the movement of people providing safe and secure storage for the waste and materials in the site.. Establishing emergency procedures against hazards and	Demolition contractor project proponent , area OSH officer project security firm members of the public	number of incidents/accidents per monthly quality of all PPES visibility and clarity of signs and alerts Efficiency of equipment such as firefighting equipment quality and efficiency of storage level of awareness of workers	Inspection and progress report	monthly daily and as often as possible daily and as often as possible weekly and spot checks bi-weekly and spot checks	**20,000**
Total cost					**85,000**

10. Public Consultation

Public Discussion is an integral part of the EIA under study. In this particular session, neighbors who are living around the proposed project site are identified by the study team in collaboration with the promoters' principal contact. All the details of the project aspect with possible queries were mentioned and the necessary reply and related facts are included on the discussion part and recommendations.

The contents of the Public Consultation can be observed in the Annex Part of the report for further referencing.

11. Conclusion and Recommendations

11.1 Conclusions

The operation of Ethiopian Skylight Five Star Hotel Phase II Project Building will lead to a variety of changes in the local environment. Many of the effects will be beneficial; particularly its impact on urban development as per the LDP study at regional level, revenue generation etc is significant.

The implementation of the project also meets the requirements of the urban development as per the urban development concept proposed in the master plan. Furthermore, implementation of the proposed project will significantly contribute to the realization of equity in terms of investment in the nation, regional as well as sub-city level.

The discussion made with the promoter and Architectural design revealed that the hotel building is going to be one of the few (may be the only one) in the country as well as the regional countries and comply with sustainable building aspects. So, it will be exemplary and comply with the country's green economy and climate smart economic policy.

Since, the project site has been used as commercial area for long time, no adverse direct or indirect impacts is anticipated in respect of sensitive habitat for wildlife, social and other major components of the ecosystem . There is no cultural heritage to be considered in the project site that could become compromised through this project. During the post-construction phase, traffic levels are unlikely to be high enough to give rise to problems of noise, air pollution or cross-road access for pedestrians. There could be some impact as a result of noise pollution because of frequent vehicular movement while construction undergoes.

The major negative impacts identified are related with operation and post construction stages. These include noise pollution from heavy cars, sight pollution, emission of GHGs from reflective Window Glasses (if entertained as windows in times of revising the building redesigning) and effluents from car wash percolates into the ground/surface etc. But they can be mitigated satisfactorily and residual impacts reduced to acceptable levels through adoption of the specified mitigation measures.

11.2 Recommendations

It is recommended to fully integrate environmental management and monitoring plan with project management, which is aimed at providing a high level of quality controls, leading to a project which has been properly designed and constructed and functions efficiently throughout its life.

These adverse impacts are all such that they are capable of control within acceptable limits, provided that the appropriate mitigation measures are adopted. It is therefore concluded that there are no environmental grounds for not proceeding with the commencing of the project in the form in which it is presently envisaged, as it is considered that the long-term social and socio-economic benefits to the country in general and the region and local population in particular are such that they are far outweigh the minor and controllable negative impacts through implementation of the appropriate mitigation measures stated in this EIA study report.

To make the project more sound, here follows some recommendations forwarded by the study team;

- ✓ Solid waste management system should be introduced by way of providing three different plastic vessels on a convenient place so that waste collectors can manage it scientifically. Decomposable waste could be made to form compost which in turn can be applied to ornamental trees and other plant species to be placed on the proposed green area and indoors.
- ✓ As the proposed building is a building for a mixed-use, it will be expected to install boilers for the purpose of showering. So, the proponent is advised to install solar heaters as source of energy for heating water. The energy source can further supply energy for light and similar purposes;
- ✓ Care should be taken while windows are covered by glasses. It is a common practice to laminate windows and glasses using sun screen plasters but most of them reflect light back into the surrounding in turn pose treat to traffic flow and eye health of the community. Thus, the wall structure should be friendly to the near-by residents and contribute less or no to the atmosphere to become warmer.
- ✓ As can be seen from the Architectural diagram, the project will have considerable amount of space as green area. So, the Architecture and Engineering team is strongly advised to enforce the constructions of the green area as most of buildings constructed in town deny the

placement of green area and use it for the purpose other than the proposed activity. The top of the roof can also be part of the green area and should entertain ease of planting trees as least ornamental once;

- ✓ The sanitary tank and car washing facility (if planned) can be re-engineered in such a way that can recycle water emanate from all effluent sources by way of sand cleaning system so that the water will be used back to water grasses and ornamental trees which are to be planted on the green area;
- ✓ Rain water harvesting system could be introduced as part of the building development. As well known, water stress is one of the problems of the town and hence rain water can be harvested during the summer season or anytime from the roof and can be concentrated on one central system via a tanker which will be placed on the roof of the building. The Water can be used for any purpose other than potable water;
- ✓ Solar Cells have been used in a larger scale to drive different machineries and serve as immediate source of energy in most parts of the world. As well known, we obtain enough solar radiation throughout the year which in turn can make the country to generate more than 60,000MW of electric energy. The proponent can install solar panels at a convenient position, particularly on the roof and windows of the building so as to harvest solar radiation and then to generate its own source of energy for the building consumption. Only initial investment matters but can be recovered in a short period of time. In related to the technology, appropriate technician and team must be assigned for proper manipulation and durability of the system.
- ✓ It is customary in most of the buildings to use electric light during cloudy conditions even in the day time. This could be corrected by recruiting or employing transparent roof at the roof systems of the building and hence natural light becomes very abundant in turn save energy and contributes ecosystem conservation.

References

1. Alemayehu Hailemariam Bekele (2015). Master Thesis on Secondary Dwelling Units' Extension: The case of residential houses in Woreda 2, Akaki-Kality sub city, Addis Ababa. Addis Ababa University. Unpublished.

2. Bole Sub-city Administration. Accessed from www.wikipedia.com on December,2019.

3. CSA (April 1996 and 2008), Central Statistical Authority. The 1994 and 2007 Population and Housing Census of Ethiopia; Results for Southern Nations, nationalities and Peoples Region. Volume 1: Part I and VI.FDRE Office of Population and Housing Commission, Addis Ababa

4. Amit Bijon Dutta et al (2014). Environmental Impact Assessment (EIA) and Construction (2014): Review Paper. International Research Journal on Environment Science. Available online at: www.isca.in, www.isca.me.

5. Constitution of the Federal Democratic Republic of Ethiopia, Proclamation No. 1/1995. Addis Ababa, Ethiopia.

6. Environmental Protection Authority (EPA) (1996), Conservation Strategy of Ethiopia, Addis Ababa, Ethiopia.

7. Environmental Protection Authority (EPA) (1997), Environmental Policy of Ethiopia: Addis Ababa, Ethiopia.

8. Environmental Protection Authority (EPA) (2000), Guideline Document: Environmental Assessment and Management; EPA, Addis Ababa, Ethiopia.

9. Ethiopian Building Code Standard II (EBCS II) (1995). Ventilation and Air Conditioning of Buildings. Ministry of Works & Urban Development. Addis Ababa. Ethiopia.

10. Federal Democratic Republic of Ethiopia. (1995), Proclamation for the Establishment of Environmental Protection Authority. Proclamation No. 09/1995. Addis Ababa, Ethiopia.

11. Federal Democratic Republic of Ethiopia. (2002), Environmental Pollution Control Proclamation. Proclamation No. 300/2002, Addis Ababa, Ethiopia.

12. Federal Democratic Republic of Ethiopia (2002), Environmental Impact Assessment Proclamation. Proclamation No. 299/2002.Addis Ababa, 2002.

13. Central Statistics Authority, 2007. The population & Housing Census of Ethiopia.

14. Environmental Protection Authority, 1997. Environmental Impact Assessment Guideline; Volume I, Procedural Guideline: Addis Ababa, Ethiopia.

15. Environmental Protection Authority, 2002. Environmental Protection Proclamation (Addis Ababa, Ethiopia).

16. IFC, EBG (2007), Environmental, Health, and Safety (EHS) Guidelines: Accessed 390 Sept 2015, IFC Website,www.ifc.org/ifcext/enviro.nsf/Content/Environmental Guidelines.

Appendices

ANNEX A Gantt chart Shows Tentative Project Implementation Schedule in short & long term activities

No.	Activity Facility	Year I 2019/20				Year II 2021/22			
		1st Qr	2nd Qr	3rd Qr	4th Qr	1st Qr	2nd Qr	3rd Qr	4th Qr
1	Area Clearing & Excavation								
2	Basement Establishment								
3	Precast Column & Slab making								
4	Block Work								
5	Finishing Works								

The following are part of the EIA report as their list of order;

Annex B: Legal Documents of the Consultant Organization

Annex C: Title Deed (Landholding Certificates' of the client)

Annex D: The Overall Architectural Designs of the Proposed Building