

STRATEGIC ENVIRONMENTAL ASSESSMENT STUDY (SEA)



PROPOSED ELDORET ICDC INDUSTRIAL PARK MASTER PLAN BLOCK 15/1757 ELDORET MUNICIPALITY UASIN GISHU COUNTY



**Industrial & Commercial Development Corporation (ICDC),
Uchumi House, Aga Khan Walk,
P.O Box 45519 – 00100, Nairobi, Kenya**

FINAL REPORT

(NEMA/SEA/5/2/044)

FEBRUARY 2017

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CERTIFICATION

This Strategic Environmental Assessment Report for the Eldoret ICDC Industrial Park Master Plan has been prepared under the leadership of Dr. Fridah W. Mugo, NEMA Lead Expert Reg. No. 0084. The report has been prepared with reasonable skills, care and diligence in accordance with the Environmental Management and Co-ordination Act of 1999, Environmental (Impact Assessment and Audit) Regulations of 2003, and the National Guidelines for Strategic Environmental Assessment of 2012.

We certify that the particulars given in this report are correct to the best of our knowledge.

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NON -TECHNICAL SUMMARY

Strategic Environmental Assessment (SEA) is recognized as a process in which environmental considerations are required to be fully integrated into the preparation of Policies, Plans and Programmes and prior to their final adoption. The objectives of the SEA process are to provide for a high level of protection of the environment and to promote sustainable development by contributing to the integration of environmental considerations into the preparation and adoption of specified PPPs.

The proposed industrial park Master Plan was conceived in accordance with the government's objective to realize industrial growth as enshrined in its development blueprint, Vision 2030 and out of the aim to create employment opportunities, support innovation, promote interactive learning and commercialization of research outputs. This park is largely envisaged to be an Agro-Industrial Park, which will add value to agricultural products/intermediates/residues, both food and non-food, by processing into products, which are marketable or usable or edible; or by improving storability, or by providing the link from farm to the market or a part thereof. In addition, the park is also expected to be a conduit for exploitation of local entrepreneurial potential. Within the context of an overall development strategy, the industrial park will be a valuable instrument to increased regional and national industrial competitiveness, as well as arrest negative externalities associated with urban congestion and 'brain drain'.

The SEA study report for the proposed Eldoret ICDC industrial park (EIIP) master plan on block 15/1757 Eldoret municipality, Uasin Gishu county, has been prepared pursuant to Constitution of Kenya 2010, article 42, revised Environmental Management and Co-ordination Act of 2015, Environmental (Impact Assessment and Audit) Regulations of 2003, and the National Guidelines for SEA of 2012. Through a rigorous participatory approach involving case study visits, public and stakeholder engagements, the SEA for the master plan has provided guidelines for sustainable management of environmental aspects of the industrial park, incorporated environmental sustainability measures in the design phase of the master plan, provided guidelines for incorporation of environmental issues in the sub-projects of the master plan, provided environmental quality bench marks for monitoring future environmental quality of the park and recommended institutional arrangements for sustainable management of environmental aspects of the industrial park.

The SEA team identified six possible intervention options to which the land can be put to use including among others: The No Intervention Option (NIO), Agriculture Use Option (AUO), Commercial Development Option (CDO), Housing Development Option (HDO), Mixed Commercial and Housing Development Option and Eco-Industrial Park Option (EIPO). The likely environmental and socio-economic impacts of each option were assessed. The Eco-Industrial Park was identified as the preferred option because it scored the highest overall social-economic and environmental benefits. Nonetheless, the proposed industrial park is envisaged to have both positive and negative social, economic and environmental impacts on the project site and the wider bioregion.

The anticipated bio-physical impacts of implementing the EIIP Master Plan includes: increased bio-diversity, conservation of green/open spaces, improved landscape, townscape appearance and the parks complementarity with the surrounding land uses during the operation phase. The positive socio-economic impacts include increased employment, social amenities, population, improved security, Foreign Direct Investment, and increased value chain benefits from backward and forward value chain linkages.

On the other hand, the negative bio-physical impacts include: Decrease in bio-diversity during the construction phase, land degradation and increased water use in the construction phase and waste water generation in the operation phase. Others are landscape appearance during construction and increase in concrete surface during the operation phase. The negative socio-economic impacts are mainly on human health from dust pollution during construction and gaseous pollutants during the operation phase. However, all these have been mitigated hence the negative effects have been minimized through the SESMP and the environmental monitoring plan.

The Master Plan for the proposed industrial park has employed various environmental management strategies guided by applicable policy, legal, and other regulatory frameworks. In addition, six overarching principles have guided the conceptualization, planning and design of the master plan to ensure that sustainable industrial activities are achieved both in the short and long term. These principles include; sustainability, ecological quality, economic vitality, social equity, technological innovation and innovative zoning.

Conversely, these principles have guided the process of impact analysis and the assessment criteria. The assessment sought to predict the significance (importance) of social, economic and environmental effects/risks of the proposed industrial park. The assessment criteria identified the likely changes to baseline conditions as a result of implementing the proposed Master Plan. The changes are described as much as possible in terms of their: geographical scale; magnitude of the impacts; time scale over which the impacts could occur; probability of the impacts occurring; frequency/rarity of occurrence of the impacts; temporary or permanent nature of the impacts (reversible or irreversible); and positive or negative attributes of the impacts.

In the SEA study, there has been a deliberate effort to integrate economic, social, technological, environmental and ecological performance in the design of the park. The principle of sustainable design has been actualized at various levels ranging from land use planning, building technology and infrastructure development. Such as promoting flows within the park through material and by-product exchange through re-use, reducing and recycling in order to minimize exploitation of natural resources. Additionally, the industrial park shall employ some of the latest ecologically sensitive designs such as sustainable waste management (by applying the 3Rs), use of green energy and green infrastructure (parks/greenery, transportation conservation, solar power use) use of green architecture such as energy efficient buildings (day lighting and natural ventilations).

In conclusion, Industrial and technological development can lead to enormous advantages for economy and society, but it can also result in awkward trade-offs, often in manufacturing and in three main dimensions: economic vs. social, social vs. environmental and environmental vs. economic. Understanding these trade-offs is a precondition for developing the right complementary strategies. To achieve gains on all three dimensions, integrative approaches are needed, which consider the full range of positive and negative consequences of innovation and promote interactions between all actors and sectors of the economy.

On the basis of the above and taking cognizance of the fact the public/stakeholders support and County Government of Uasin Gishu already granted development approval of the proposed project, it is hereby recommended that the National Environmental Management Authority do consider, approve and grant required Strategic Environmental Assessment License to the proponent in respect to Plot Parcel No. 1757 Block 15/1757 Eldoret Municipality, Uasin Gishu County.

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LIST OF ACRONYMS

EA	Environmental Audit
ICDC	Industrial and Commercial Development Corporation
EIA	Environmental Impact Assessment
EIIP	Eldoret ICDC Industrial Park
EMCA	Environmental Management and Coordination Act
ESMP	Environmental and Social Management Plan
ELDOWAS	Eldoret Water and Sanitation Company
FDI	Foreign Direct Investment
IPMP	Industrial Park Master Plan
KAM	Kenya Association of Manufacturers
KEBs	Kenya Bureau of Standards
KenHA	Kenya National Highways Authority
KEPSA	Kenya Private Sector Alliance
KFA	Kenya Farmers Association
KIRDI	Kenya Industrial Research and Development Institute
KNCCI	Kenya National Chamber of Commerce and Industry
KPC	Kenya Pipeline Company
KURA	Kenya Urban Roads Authority
KVDA	Kerio Valley Development Authority
NEMA	National Environment and Management Authority
NCPB	National Cereals and Produce Board
NCTTCA	Northern Corridor Transit and Transport Coordination Authority
PPPs	Policy Plans and Programmes
SEA	Strategic Environmental Assessment
UNES	University of Nairobi Enterprise and Services Limited

CHAPTER ONE INTRODUCTION

1.1: BACKGROUND

The Industrial and Commercial Development Corporation (ICDC) was established in 1954 under the ICDC Act cap 445 of the Laws of Kenya. ICDC is a development Finance Institution whose mandate is to facilitate industrial and economic development in Kenya by providing various financial services.

In line with the overall Government of Kenya' plan enshrined in Vision 2030's manufacturing sector goals of SME parks, the Industrial & Commercial Development Corporation (ICDC) has prepared a Master Plan for an Industrial Park within Eldoret Municipality on Block 15/1757. The proposed Industrial Park is expected to, among others, serve as focal point for supporting innovation, commercialization of industrial research findings, technology transfer, sub-contracting, cluster formation and promoting best practice in production and work environment for the benefit of the local community and the region at large. In addition, the proposed Industrial Park is expected to provide Physical and Business Development Services (BDS) facilities to support the local and foreign enterprises and facilitate their growth in various industrial sub sectors such as agro processing, agro machinery, as well as support services sectors i.e. packaging, ICT, etc.

Conversely, the park's main customer is envisaged to be the enterprises that will be manufacturing and processing within it. It intends to offer the following main services, among others: Light manufacturing infrastructure; Office Complex; Commercial zone (shopping malls, banks etc.); Conference facilities; Catering facilities; Accommodation facilities; Effluent treatment plant site; Utilities: Water, Electricity, Communication; Greenery zone; Training centers; Business Development Center; Research Laboratories; Show rooms for finished products, Warehousing; Godowns among others.

1.2: RATIONALE FOR THE PROPOSED ELDORET ICDC INDUSTRIAL PARK

An industrial park or estate is a community of manufacturing and service businesses located together on a common property. The sizes of the parks do vary based on land availability, capital, cheap local labor, market for industrial land and outputs among others. Industrial parks vary in size and function; thus, we have those engaged in agro-products, and engineering, technology etc. as a result, each park will have industries based on its function.

Kenya requires new industries and technologies to modernize, diversify and to realize the goal of sustainable industrial development. Industries in Kenya face challenges such as accessing information, new technological knowledge and finance. Weak institutions and a lack of regulations is also a challenge thus inhibiting progress towards realizing development objectives. This proposed Eco-Industrial Park can be used to overcome these obstacles and accelerate economic development by attracting innovative businesses, leading to both more jobs and a larger tax base. The park is expected to support start-ups, new enterprise incubation, the development of knowledge-based businesses, and offer an environment where local and international firms can interact with centres of knowledge creation.

Moreover, the proposed park will act as innovation hubs, promoting interactive learning and the commercialization of research outputs, and a conduit for exploitation of local entrepreneurial potential. Moreover, within the context of an overall development strategy, this industrial park will be a valuable instrument to increase regional and national industrial competitiveness, as well as arresting negative externalities associated with urban congestion and 'brain drain'. This park has been designed to provide an institutional framework, modern administrative services and a physical infrastructure that may not be available to individual industries, which are not agglomerated. Fundamentally, agglomeration or clustering of various industries into an industrial park ensures that these industries take advantage of public infrastructure, economies on construction and common facilities, and gain access to nearby skilled labour markets, research and education facilities and other critical inputs.

1.3: LEGAL CONTEXT OF THE SEA FOR THE PROPOSED PROJECT

The Constitution of Kenya 2010, article 42 provides every person has the right to a clean and healthy environment which includes the right to have the environment protected for the benefit of present and future generations through legislations and other measures particularly those contemplated in Article 69; and to have obligations relating to the environment fulfilled under article 70. The Environmental (Impact Assessment and Audit) Regulations, 2003 recognizes SEA as a measure of Environmental Impact Assessment at Strategic level such as Policy, Plan and Programme (PPP). The regulations section 42 and 43 address SEA; Section 42(1) requires lead agencies in consultation with NEMA to subject all policies, plans and programmes for implementation to a SEA. Regulation 42(3) commits the government and all lead agencies to incorporate principles of SEA in the development of sector or national policies.

According to NEMA SEA guidelines of 2012, SEA refers to a range of analytical and participatory approaches to integrate environmental consideration into policies, plans, or programs (PPP) and evaluate the interlinkages with economic and social considerations. SEA is a family of approaches that uses a variety of tools, rather than a single, fixed, prescriptive approach. The SEA process extends the aims and principles of Environmental Impact Assessment (EIA) upstream in the decision-making process, beyond the project level, when major alternatives are still possible (UNEP, 2002). Consistent with Agenda 21 principles, SEA is a proactive approach to integrate environmental considerations into the higher levels of decision-making.

In principle, the proposed Eldoret ICDC Industrial Park Master Plan (land use plan and infrastructure plan) is considered as a policy plan which must therefore be subjected to a SEA. The proposed development is a masterplan thus is subjected to SEA. The broad purpose of the SEA for the proposed EIIP is to systematically integrate environmental considerations to:

- Guide the master plan proposals to ensure they are compatible with sustainable environmental planning and management;
- Ensure the full consideration of alternative plan options including the do-nothing option, at an early time when the agency has greater flexibility;
- Enable consistency to be developed across different sector policies especially where trade-offs need to be made between the objectives of the sectors;
- Guide investment programmes involving multiple sub-projects or sector policies;

- Identify environmental impacts and opportunities of mitigation measures into programme designs during the formulation stage of the plan and programmes, and in the process, enhance environmental management plans;
- Ensure that the cumulative, indirect or secondary impacts of diverse multiple activities are considered, including their unintended consequences;
- Obviate the needless reassessment of issues and impacts at project level where such issues could have been more effectively dealt with at a strategic level, and offer time and cost savings;
- Provide information to decision makers by evaluating alternative options that meet proposal objectives based on the best practicable environmental options;
- Ensure that environmental principles such as sustainability, polluter pays and the precautionary principle are integrated into the development, appraisal, and selection of plan and policy options;
- Give proper place to environmental considerations in decision making as concerns economic and social issues, in view of the fact that in some contexts they may be traded off against each other;
- Provide an early opportunity to check whether or not the proposal complies with national and international environmental policy and consequent legislative obligations;
- Contribute to the establishment of context that is more appropriate to nest future development proposals;
- Provide a publicly available and accountable decision making framework.

1.4: GUIDING PRINCIPLES

1.4.1: Guiding Principles of the SEA

There is growing interest in sustainable development that focuses on balancing environmental, community, and business interests in Kenya. Equally, borrowing from the above National SEA guidelines of 2012. The principles used to guide the study include the following as provided by the National SEA guidelines of 2012:

- a) The sustainable use of natural resources.
- b) The enhanced protection and conservation of biodiversity.
- c) Inter-linkages between human settlements and cultural issues.
- d) Integration of socio-economic and environmental factors.
- e) The protection and conservation of natural physical surroundings of scenic beauty.
- f) The protection and conservation of the built environment of historic or cultural significance.
- g) Public and stakeholder engagement.

1.4.2: Guiding Principles of the Proposed Industrial Park

The Master Plan for the park has been designed to foster sustainable industrial development through an integrated approach. This approach has embraced the principles of eco-industrial parks that focuses on achieving a community of manufacturing and service businesses that are keen on enhanced economic and environmental performance through collaboration in managing environmental and resource issues, including energy, water, and materials. The eco-principles of the EIIP design include:

- a) **Sustainability Design:** The adoption or branding of the proposed project as Eco-Industrial Park implies a high level of conscience and deliberate responsibility should be employed towards the economic, social, technological, environmental and ecological performance of the park. As a result, the park shall employ design concepts aiming at promoting ecological sustainability. These shall include but not limited to: Green Buildings concept: the designing and development of energy efficient buildings that are flexible and adaptable to multiple uses; Re-Use/ Recycle concept: efforts to minimize waste generation and disposal through effective management of the same; Energy efficiency: utilization of multiple energy alternatives that are clean and affordable. Concepts like energy cascading are key; Waste Management: proper policy and institutional frameworks for waste management. Application of 3Rs will be utilized at large; Environmental Management: Presentation of environmental and ecological degradation through EMPs and social corporate responsibility.
- b) **Ecological Quality:** Establishing an industrial park system which conserves natural and economic resources; reduces production, material, energy, insurance and treatments costs and liabilities; improves operating efficiency, quality, worker health and public image; and provides opportunities for income generation from use and sale of wasted materials
- c) **Economic Vitality:** Developing a community of businesses that seek a collective benefit that is greater than the sum of the individual benefits each company would have realized if it optimized its individual interests. On the same note, reduce raw material and energy cost, waste management cost, treatment cost, and regulatory burden, and increase competitiveness in the world market as well as the image of the companies.
- d) **Social Equity:** An industrial park that creates new job opportunities (for both gender) through local utilization and management of natural resources. Develop business opportunities and increase cooperation and participation among different industries.
- e) **Technical/Technological development:** Establishing a system that shall engage the locals and relevant persons in ways that will empower their technical and technological capacity through practice, training or apprenticeship:
- f) **Plot Mix/zoning:** A well balanced industrial park with respect to spatial distribution of plot sizes, land uses and functional areas. Clustering of compatible functions and use of value chain system to enable cohesive and harmonious operations.

1.5: SEA SCOPE

1.5.1: Spatial Dimensions

The spatial dimensions will depend on the sector under consideration. For sourcing of agricultural and forestry raw materials for the industries, the area will be mainly the North Rift Region. For infrastructure, e.g. road network, airports, and telecommunication it is generally national, while for management of environmental parameters of the park, it is limited to the 135 acres of land and its environs.

1.5.2: Institutional Dimensions

As per the NEMA screening response letter, the SEA study extended to consult various institutions, stakeholders and the regional players using the Northern Economic Corridor as far as the proposed ICDC industrial park is concerned. These included inter alia: KURA, KFA, Kenya Railways, Maize Board & NCPB Uasin Gishu County, Military complex, RAIPLY and KPC, transportation stakeholders both the PSV (North Rift Shuttle, Eldoret Express, Eldoret shuttle, Matatu SACCOs in Eldoret, Kenya Taxi Association etc.) and transit goods

transporters. Others include the Government agencies with the mandate of industrial development and trade, regulatory agencies such as NEMA, WRMA and Occupational Safety and Health Services.

1.5.3: Temporal Dimensions

This deals with the lifespan and reversibility of impacts. The SEA study covered short term, medium term and long-term environmental and socio-economic effects. Short-term impacts will be mainly during the construction phase. The medium term will consist of direct impacts from the operation phase while long-term will consist of the Master Plan outcomes and restoration phase. The exact timing will vary since individual investors will start and complete at different times. The type of effects and impacts covered by the SEA includes positive and negative impacts, short, medium and long-term impacts, cumulative, synergistic and secondary impacts, temporary and permanent impacts.

1.6: PROJECT SITE

1.6.1: Proposed Site Location

The industrial park site is situated about 3 km from Eldoret CBD along Eldoret-Kisumu road in Block 15/1757. The site occupies a total of 135 acres and is bound by a 20m road reserves on the Northern, Eastern and Southern edges. The site boundaries are well delineated. The southern road has a pipeline way leave, with a sewer line running on the western section of the site, with some manholes situated within the site boundary. The site is largely covered by green vegetation with a few areas especially those currently being used as paths with bare soil exposure.

Figure 1: Location of the Project Site and its Context

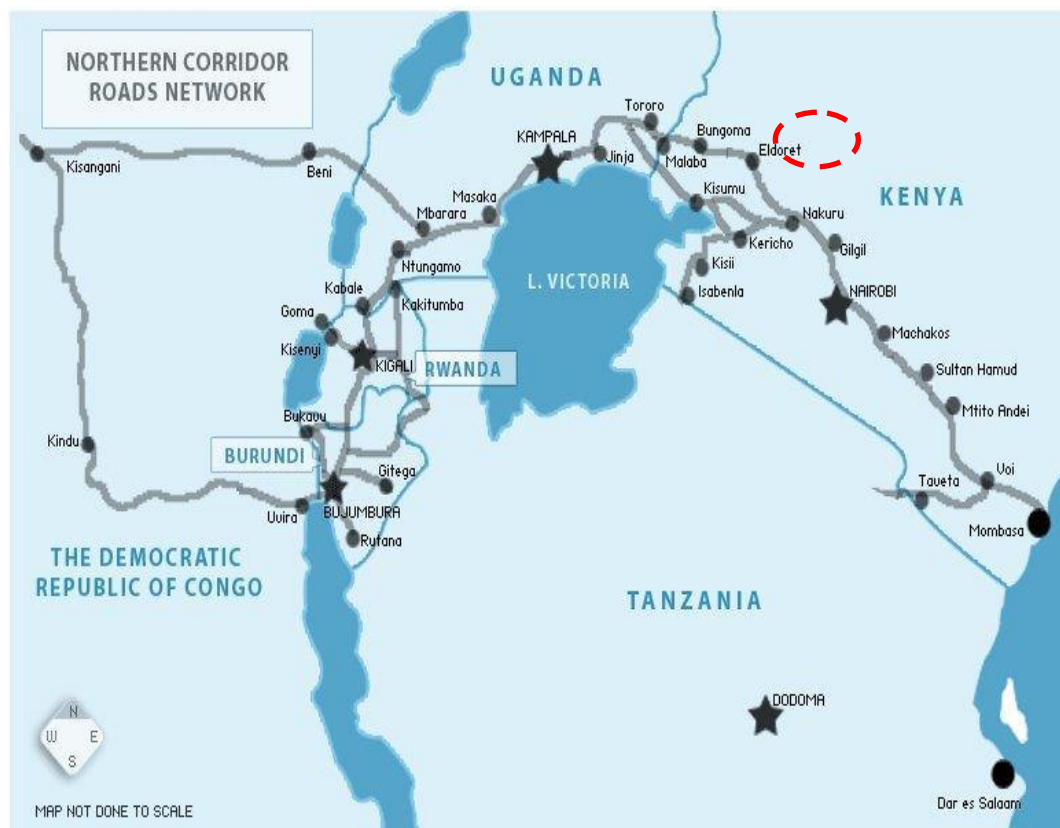


1.6.2: Northern Economic Corridor

At the wider scale the SEA study has covered the Northern Economic Corridor (NEC). The NEC is the busiest and most important transport route in East and Central Africa, providing a gateway through Kenya to the landlocked economies of Uganda, Rwanda, Burundi and Eastern DR Congo. It also serves Southern Sudan since it broke away from Khartoum. The main Northern Corridor transport network is connected to the Port of Mombasa and includes a road network; railway line; rail-lake transport; inland water routes; container terminals commonly regarded locally as ICDs (Inland Container Depots); Tororo Inland Port and an oil pipeline. The proposed ICDC Eldoret Industrial Park lies close to this major transit gateway hence the foreseen benefits include the following:

- Provision of a convenient transport solution for the ICDC Industrial Park food, agro-based, textile and leather products.
- Strengthening the Industrial park position as a gateway, economic and logistics hub to the North Rift and East African sub-region through trade, regional economic integration and interconnectivity.
- Providing massive development opportunities for the ICDC Industrial Park and the County at large through employment creation, investment, and economic growth.
- Facilitating the proposed ICDC Industrial Park to tap resources, introduce high-value investments and new technologies, supply of raw materials and export locally and internationally from the park not only through NEC but also the Eldoret International Airport.

Map 1: Position of Eldoret Town within the Northern Economic Corridor



1.7: SEA STUDY TEAM

This SEA for the proposed ICDC Industrial Park Master Plan has been prepared by the University of Nairobi Enterprise Services Limited (UNES) under a joint consortium of practicing professional and project assistants listed below:

Table 1: The SEA Study Team

Consultant	Profession	Project Assistants
1. Dr. Fridah Mugo	SEA/EIA Expert	Brian Okoth Peter Naibei
2. Mr. Philip Olale	Environmental Law Expert & Coordinator	
3. Dr. Ngayu Margaret	Sociologist	
4. Plan. Charles Karisa	Physical Planner	Mwenje Emmanuel Bessy Thurania Philip Olale Naibei Peter
5. Arch. Erastus Abonyo 6. Arch. Margaret Njoroge	Architect	Simwichi Nicholas George Wekesa Edith Tonui Wendy Nelima Josephine Ngatia
7. Eng. Abuodha Sylvester	Civil Engineer	Jafferson Omollo Charles Abuodha
8. Eng. Gabriel Jabongo	Mechanical Engineer	Serem K. Anderson. Muthama Joel
9. Prof. Abungu Nicodemus	Electrical Engineer	Ongalo Stephen
10. Dr. Musyoka Mulei	Land Surveyor	
11. Qs. Olivia Otieno	Quantity Surveyor	Bellis Ochieng'
12. Dr. Luke Obala	Land Valuer	
13. Mr. Osengo Charles	Economist	
14. Ms. Judith Onyoni	Landscape Architect	

1.8: REPORT STRUCTURE

The SEA report has been organized as follows:

Non-Technical Summary: This section presents a summary of the SEA report. It broadly covers the SEA background, study methodology, study findings, baseline environmental conditions of the project area and northern economic corridor, environmental impacts, mitigation, environmental management plan, conclusions and recommendations.

Chapter 1 - Introduction: This chapter gives a background of the project, location, objectives and the SEA study team.

Chapter 2 - Approach and Methodology: This chapter describes the approach and detailed methodology used to achieve the study objectives.

Chapter 3 – Proposed Industrial Park Master Plan: This chapter gives a detailed description of the Eldoret ICDC industrial park master plan.

Chapter 4 - Policy, Legal and Institutional Framework: This chapter provides an overview of the policies, legislation and institutional frameworks relevant to the SEA study and implementation of the Eldoret ICDC Industrial Park master plan.

Chapter 5 – PPP Framework for the Proposed Industrial Park Master Plan SEA- The chapter provides the various policies, plans and on-going projects/programmes that are linked to the proposed development.

Chapter 6- Baseline Environmental Conditions: This chapter describes the existing physical, biological and socioeconomic environmental conditions of the project context.

Chapter 7 - Stakeholder and Public Consultations: This chapter details the stakeholders consulted, public consultations held and emerging issues.

Chapter 8 - Alternatives to the Industrial Park: This chapter discusses alternatives to the proposed industrial park and justification for each option.

Chapter 9 - Strategic Environmental Impacts, Significance, Management Strategies and Mitigation: This chapter provides the strategic environmental impacts, significance, management strategies and mitigation measures.

Chapter 10 - Strategic Environmental and Social Management and Monitoring Plan: This chapter prescribes and directs the management of all environmental aspects of the EIIP Master Plan including the physical, natural and social impacts, associated with and arising from planning, construction, and operation of the proposed components of the Master plan.

Chapter 11-Implementation, Monitoring and Evaluation Management Plans- This chapter presents the approach towards implementation; monitoring and evaluation management plans for the implementation process of the proposed project.

Chapter 12 – Conclusion and recommendations – This chapter provides the conclusion and recommendations of the SEA study.

CHAPTER TWO APPROACH AND METHODOLOGY

2.1: OVERVIEW

The International Association for Impact Assessment (IAIA) defines Strategic Environmental Assessment (SEA) as a process of preliminary identification and consideration of the possible negative impacts into the environment and human health caused by implementation of any policy, plan or programme (PPP). Essentially, SEA is used to integrate environmental considerations into PPP. The goal of a SEA is to improve policies, plans or programmes in such a way as to minimize their potential negative environmental impacts, maximize positive impacts and ensure that negative impacts that cannot be avoided are properly managed and offset during implementation of the PPP.

2.2: SEA STUDY PROCESS

Three broad steps were followed in the SEA study of the proposed Eldoret ICDC Industrial Park (EIIIP). They included screening, scoping and the detailed SEA study.

2.2.1: Screening

Screening was undertaken to determine whether the proposed Industrial Park Master Plan required a Strategic Environmental Assessment. After consultations with NEMA, it was recommended that the Master Plan undergoes a SEA. In response, NEMA instructed the study team to carry out a strategic environmental scoping exercise and submit a SEA scoping report to NEMA for review. The NEMA screening response is attached in this report.

2.2.2: Scoping

Following the determination that a SEA was necessary for the Industrial Park Master Plan, the scoping study was done to identify the key issues to be studied during the detailed SEA study. This was done through literature review and wide stakeholder and public consultation in order to identify and describe the key environmental effects of the proposed industrial park as conceptualized by the professionals, key stakeholders and the public (see chapter 7). A scoping report was submitted to NEMA and approved via Reference No. NEMA/SEA/5/2/044.

2.2.3: Detailed SEA Study

The detailed SEA study included: baseline data collection of the site; review of relevant policies, legislation and institutional framework; analysis of reasonable alternatives; identification, analysis and prediction of environmental and social impacts; identification of appropriate mitigation measures and impact management strategies. Other steps included formulation of an Environmental and Social Management Plan (ESMP); Environmental Monitoring Plan (EMP); Environmental Impact Statement (EIS); decision-making and a follow up plan.

2.3: METHODOLOGY OF THE SEA STUDY

2.3.1: Consultation Meeting with the Client

The SEA scoping process started with a consultative meeting with the Client ICDC. This was specifically to get a clear background of the project, clarify the main objectives of the Industrial Park Master Plan and establish the environmental, socio-economic and institutional concerns that need to be addressed in the master planning process.



Figure 2: Consultation Meeting with the Client

2.3.2: Site Visits

The consultative meeting shown in Plate --- above was followed by a field visit to site. The purpose of the visit was to observe the features on the ground and establish facts that needed to be considered in the SEA scoping process. These included facts on the type of terrain (landscape), slope, vegetation, sensitive ecological features, site land uses, neighboring land uses, status of the land quality and observable environmental and socio-economic challenges.

2.3.3: Review of Policy, Legislative and Institutional Frameworks

The study was also informed by the review of policy, legal and institutional frameworks which included the Millennium Development Goals (MDGs) of 2002, Sustainable Development Goals of 2015 (SDGs), Kenya's Vision 2030, National Industrialization Policy, National Land Policy of 2009, the Strategy for Revitalization of Agriculture of 2004, the Water Policy of 2012, Energy Policy of 2012 and the draft Environmental Policy of 2012. The legal and regulatory documents reviewed included, the Kenya Constitution, the Environmental Management and Coordination Act of 1999, National Guidelines for Strategic Environmental Assessment of 2012, the Water Act of 2002 and Physical Planning Act Cap 286 of 1996, the Directive 2001/42/EC of the European Parliament and the Council of 27/6/2001 among others. The new institutional arrangements at the National and County level were also reviewed with the intention of identifying those that will be affected by the development and implementation of Eldoret ICDC's Industrial Park Master Plan.

2.3.4: Review of SEA Studies and Related Information

Review of past SEA studies aid in the deeper understanding of the process and possible type of outcomes. Some of the SEA studies reviewed includes the Strategic Environmental Assessment for Nairobi Integrated Urban Plan (NIUPLAN, 2013), Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland, (2001-DS-EEP-2/5) Synthesis Report, the Tana-River Catchment SEA of 2012 and the SEA study of revoking the West Midlands Regional Strategy 2012 of the United Kingdom. The preliminary field reports by the different study teams such as the survey team, the civil engineering and infrastructure team, the power distribution team were also reviewed to identify key environmental issues at the site.

2.3.5: Key Informant Interviews

Key informants were identified by the study team assisted by the client ICDC and the County Government of Uasin Gishu. Identification was based on their potential role in the Industrial Park Master Plan formulation and implementation. A total of 19 key informants were interviewed using key informant interview guides. They consisted mainly of ICDC Officials, Officials from the National Government, Uasin Gishu County Officials, Government Parastatals such as Kenya Power, Kenya Urban Roads Authority (KURA), Water Resources Management Authority (WRMA), National Environment Management Authority (NEMA); and officials from private companies in Eldoret, such as Eldoret Water and Sanitation Company Ltd (ELDOWAS) and Rift Valley Textiles (Rivatex). Elected political leaders such as the MCA for the area were also interviewed. Others included Officials from Associations such as the Chamber of Commerce, the SME association, NGOs and CBOs among others.

2.3.6: Key Stakeholder Consultation

A Stakeholders' Consultation Forum was held at the Star-Buck Hotel in Eldoret on September 1, 2015. Participants in the consultation consisted of the key informants already interviewed and others who had not been interviewed earlier particularly officials from NGOs, CBOs, Youth Groups and representatives of different religious groups. The objective of the consultation was to present to stakeholders' preliminary proposals on categories of land uses, prototype industries and key environmental and socio-economic issues of concern. The information gathered using the approaches described above and from brainstorming sessions of the study team was compiled and presented to a Stakeholders' Consultation Forum over 60 participants (Appendix 6) by the lead land use and environmental consultants. The purpose was to create awareness, and have additional analysis and inputs.

2.3.7: Public Consultation

The Stakeholder Consultation Forum was followed by a Public Consultation at the Eldoret ICDC grounds in which over 1000 participants attended. The approach that was used to inform the different stakeholders included: letters particularly to leaders such as politicians and administrators, posters and fliers in strategic locations, announcements in religious gatherings, neighboring secondary and primary schools, telephone calls and e-mails to key officers. A public-address system was hired to ensure that all the people hear and participate in the interactions.

The conceptual master plan and the proposed prototype industries were presented to participants by the lead land use consultant. This was followed by a presentation on the SEA and a summary of environmental and socio-economic issues raised in the Stakeholder Consultation Forum. Due to the large number of participants, it was not possible to listen to all the questions, which participants wished to raise. However, participants who did not have a chance to air their views were requested to write them on a paper and hand them over to any member of the study team for inclusion in the analysis and documentation.

2.3.8: Household Interviews

To capture detailed quantitative and qualitative data on the opinions of members of the communities neighboring the Industrial Park site, household interviews were conducted in three of the residential estates. Six research assistants (two from each estate) were recruited and trained on how to conduct the household interviews. A pilot test was conducted to test the suitability of the research instrument. A total of 140 households from Langas (67), Pioneer (37) and Kipkaren (36) Estates were interviewed.

2.3.9: Study Team Brain Storming Sessions

Brain storming sessions on all emerging issues were held throughout the scoping period to identify, analyse and synthesize the key issues of land use, environmental and socio-economic concerns that need to be addressed in the Master Plan. The issues agreed on were directly incorporated in the plan.



Figure 3: Study Team Brain Storming Sessions

2.3.10: Measurement of Baseline Water Quality Levels

An assessment was carried out on 18th April, 2016 to establish the baseline water quality at the proposed Eldoret ICDC Industrial Park site before development and to obtain data that can be used to form a basis for planning the control measures to eliminate or minimize pollution to water and the environment after development.

The water samples were collected by a NEMA Lead Expert and Laboratory representative and taken to Eldoret Water and Sanitation Company Limited; a NEMA accredited Laboratory for analysis. The Following parameters were checked: Turbidity, pH, Total Dissolved Solids, Nitrates, Phosphates, Conductivity, Faecal Coliform, Total Hardness, Iron, Fluoride, Sulphates, Manganese, Chloride and Zinc.

2.3.11: Measurement of Baseline Air Quality Levels

The air quality assessment was carried out at the proposed site by an Expert from Eco-serve Laboratory on 6th April 2016 from 9.30 am to 1.05 pm. with the aim of establishing baseline air quality and noise levels at the proposed development site to obtain data that can be used to form a basis for planning the control measures to eliminate or minimize human and environment exposure to noise & negative air quality impacts from the proposed development activities. An assessment of concentration of greenhouse gases emission namely; Carbon monoxide (CO), Carbon Dioxide (CO₂), Sulphur Dioxide, (SO₂) and Volatile Organic Compounds (VOC) was also carried out.

Static dust samples (total dust) of size less than 10µm aerodynamic diameters were taken on Millipore cellulose 0.08µm membrane filter by placing pre-weighed filters at the site of interest for ten to twenty minutes. A close supervision on the sampling instrument was taken to make sure that the sampler was operating as expected. The concentration of suspended particulate matter (dust) is determined by a gravimetric method. The sampling time and frequency corresponded to the character of the sampling site. The amount of dust captured on the filter (mg) is determined gravimetrically as a difference between the weight of the filter before exposure to dust and the weight of the filter and dust after exposure.

Air quality measurements were undertaken using a Drager Tube Flue Gas Analyser. This is a direct reading instrument that has the capacity to measure and display the products of combustion from a domestic or commercial fossil fueled appliance. It can also measure ambient air quality in rooms or buildings. The measurements are carried out by placing the probe at the general area in/along proposed site and directly reading the levels of the parameters on the tubes.

The air concentration levels obtained after analysis were compared with the EMCA 1999 Air Quality Regulations Legal Notice No.34 and World Health Organization (WHO) standards Guidelines, while the Noise levels were compared with the EMCA 1999 (Noise and Excessive Vibration Regulations) standards.

2.3.12: Measurement of Baseline Noise and Vibrations Levels

A precision integrating sound level meter type CR 262A S/No. B21122FA with Omni-directional microphone set at a slow response was used. The instrument was calibrated using Bruel and Kjaer sound level calibrator type 4230 for sound level meter at 94 dB (A) and 1000 Hz. The calibration was used to check the sensitivity of the instrument immediately before and after the measurement period.

The meter was set to measure the A-weighted noise level, which varies with the frequency and intensity like the sensitivity of the human ear and vibration. The sound level meter was held at 1 metre from ground and L eq (the continuous equivalent sound pressure level) sample measurements at and around the proposed project road was taken.

2.3.13: Measurement of Baseline Soil Health Conditions

The soil samples were collected by NEMA Lead Expert and taken to NEMA accredited Laboratory for Analysis. The following parameters were checked; pH, Electrical Conductivity (EC), Lead (Pb), Zinc (Zn), Copper (Cu), Potassium (K), Sodium (Na), Calcium (Ca), Magnesium (Mg), Manganese (Mn) and Iron (Fe).

2.3.14: Measurement of Baseline Radiation Levels

The measurements for radiation levels were carried out on 06/04/2016 during day time. Radiation Monitor with 1.2 Meter Telepole Detector [Type: Rm 703] was used to assess the soil health condition in terms of radioactivity. RADMON (micro) Type: RM703A is a G.M. Detector based, battery powered, hand-held, general purpose radiation Survey Meter. This will be useful for dose rate measurements in Nuclear installations, Radiochemical plants, Reprocessing plants, etc. Additionally, it will be useful in medical, agricultural, industrial and other installations where radioactive isotopes are used for a variety of applications. This product is designed around a Microcontroller Chip. It is provided with alpha Numeric LCD display for indicating the dose rate in digits, dose rate as a bar graph, cumulative dose in digits. It covers wide range from 0 to 20 R/hr above the 20 R/hr it will indicate the OVR in the display. This unit has a facility for storing the data into built-in EEPROM along with real time. The stored data can be recalled on to the display or transmitted to the PC. The soil samples collected at the proposed Eldoret ICDC Industrial Park were subjected to radiation measurement. The soil radiation levels are within limit. This indicates that the proposed land does not have radioactive source.

2.4: ENVIRONMENTAL IMPACTS IDENTIFICATION AND ANALYSIS

2.4.1: Scoping out of Industrial Typologies

Various approaches and methods were used for scoping out undesirable developments. They included: i. analysis of the industrial and business typologies considering viability as concerns availability of raw materials and value-chain-wide benefits; analysis of alternatives to the industrial park and potential environmental and social impacts of the proposed Master plan.

For the study team to determine industries to be scoped out, it relied on the outcome of the key stakeholder consultations, public consultations and expert judgment of SEA team members. The industries scoped out were: (i) A tannery, (ii) Slaughter house and (iii) Agro-chemical Industries mainly on the grounds of excessive environmental emissions.

2.4.2: Analysis of Alternatives

The alternatives considered were identified from the proposal by the client ICDC of desiring to invest in an industrial park. Others were identified from the common land uses in the neighborhood. They included agriculture, housing, commercial and combination of housing and commercial. Six possible development options for the 135 acres of land were therefore identified as: (a) no intervention option, (b) agricultural land use option, (c) commercial only development option, (d) housing only development option (e) mixed commercial-housing development option and (f) industrial park development option.

Environmental impacts of the six alternatives were identified and scored based on the activities likely to be implemented if each of them was to be adopted. The scoring was based on the likely impacts on the bio-physical and socio-economic environment parameters derived from the six SEA principles and stakeholder views. The color codes scheme for scoring and weighting for quantitative analysis was as indicated in Tables 2.

Table 2: Scoring and Weighting Scheme for Impacts Analysis

-2	-1	0	+1	+2
(-2) = Significant Negative. (-1) = Minor Negative:				
(0) = Neutral:				
(+1) = Minor Positive: (+2) = Significant Positive:				
S–Short Term (0-12 months), M–Medium (> 12 Months < 5 Years), Long – Term (> 5 years)				

The six alternatives were evaluated on their rating on 11 sub-themes of the bio-physical and 7 of the socio-economic environment as detailed in Table 7. The criteria used involved giving a score ranging from significantly negative (-2) through neutral = 0 to significantly positive (+2) as indicated in Tables 8-19. Each alternative was assessed for biophysical and socio-economic impacts as indicated in these Tables. Each impact was also classified based on intensity, duration and weighted scores in the matrix. The scores were added and summarized as indicated in Table 7 by the whole study team. For the preferred alternative, mitigation measures were identified for negative impacts, and environmental management and monitoring plans for effective implementation formulated.

2.5: STAKEHOLDER IDENTIFICATION AND ANALYSIS

Stakeholders were identified on the basis of whether they will affect the implementation of the Industrial Park Master Plan or they will be affected by it. Identification of stakeholders was informed by a desk study, recommendations made by officials of Uasin Gishu County Government, the project proponent and expert judgment of the SEA team. The Stakeholder Forum was held on September 1, 2015 and the Public consultation held on 4th September 2015. The Key informant interviews were held between July and September 2015 and others in April 2015. Household surveys were administered from 1st to 4th September 2015. Focus Group Discussions were held with the Agriculture, Livestock and Forestry Platform Stakeholders in May 2016. Those identified are as indicated in Chapter six of this report.

2.6: HARMONIZATION OF FINDINGS AND REPORT WRITING

The SEA team synthesized and harmonized the study findings in a report-writing workshop. This was to ensure that key environmental and socio-economic aspects have been captured and documented clearly and logically.

CHAPTER THREE

PROPOSED INDUSTRIAL PARK MASTER PLAN

3.1: OVERVIEW

Industrial parks are among the most important features of progressive economic development and an effective vehicle for attracting investment, fostering technological transfer and innovation, and for creating jobs. With the potential to generate comparative and competitive advantages, industrial parks can attract innovative businesses, leading to both jobs increment and a larger tax base.

The industrial park's key vision is to be a leading frontier in industrial estate design, setting standards in sustainability, social amenity and building efficiency. The specific objectives of the park include to:

- Integrate economic, social, technological, environmental and ecological performance in its design.
- Conserve natural resources by promoting flows within the park through material and by-product exchange through re-use, reducing and recycling.
- Serve as a focal point for supporting innovation (innovation hub) that will empower locals' technical and technological capacity through practice, training or apprenticeship.
- Create room for job opportunities (for both gender, race and colour), nurturing and transfer of technology through incubation and local employments.
- Enhance research and technology transfer through cultivating start-up ideas, technological innovations and experimentation of the same.
- Facilitate cluster formation integrated model for collective benefit and augmenting competitiveness in the local and world market in order to achieve economic vitality.

3.2: THE MASTER PLAN

The industrial park occupies approximately 135 acres of land. The Master Plan for the park is designed to foster sustainable industrial development through an integrated approach. This approach has embraced the principles of eco-industrial parks that focuses on achieving a community of manufacturing and service businesses that are keen on enhanced economic and environmental performance through collaboration in managing environmental and resource issues, including energy, water, and materials.

Subsequently, the park promotes a system of planned materials and energy exchanges that seek to minimize energy and raw materials use, minimize waste, and build sustainable economic, ecological and social relationships. The master plan broadly provides rationale for land use activities within the site in addition to providing detailed infrastructure plans (roads, power distribution, sewerage, drainage, telecommunication, and utility installations – these are discussed in detail in subsequent sections). The spatial representation of the master plan is shown in Figure 4.



Figure 4: Eldoret ICDC Industrial Park Master

3.2.1: Land Use Plan

The Land Use Plan entails a description and spatial representation of the various land uses provided in the park. The organization of various land uses on the industrial park was informed by among others theoretical land use planning concepts, zoning regulations from Uasin Gishu County, case studies especially from India, and site suitability analysis. Conversely, some of the key land use organization concepts that guided the organization of various land uses within the industrial park include; compatibility, clustering, carrying capacity, conservation, co-location, and integration of land uses.

Arising from the needs assessment and land use organization concepts, five key land uses were identified and adopted in the development of the park. The specific land uses and the amount of land allocated for each is presented in Table 3 below.

Table 3: Land Use Budget

Land Use	Proposed Activities	Amount of Land Allocated	
		%	Acreage
1. Industrial use	<ul style="list-style-type: none"> - The predominant land use in the park is basically light industrial activities - Has been categorized into two - light heavy industries and basic light industries - based on the nature of industrial activities envisaged. - Light heavy industries are perceived to be of higher energy consumption, high turnover and likely to generate more toxic waste and byproducts compared to light industries - Other functions include logistics and incubation center. 	62%	83.82
2. Commercial	<ul style="list-style-type: none"> - Will accommodate commercial developments such as ICDC Complex, commercial car park building, small-scale business complex among others 	6.3%	8.55
3. Road way-leave	<ul style="list-style-type: none"> - Covers the total way-leave land (18m and 15m) allocated for road and other trunk infrastructure 	19.2%	25.86
4. Green/open space	<ul style="list-style-type: none"> - Open spaces create room for recreation, relaxing of workers and promote ecological conservation and environmental ambience through green infrastructure and aesthetics 	7.7%	10.40
5. Utilities and Amenities	<ul style="list-style-type: none"> - Are uses/facilities that provide everyday necessities for convenience of users - Include water reticulation systems, power reticulation, sewerage and waste treatment systems and ICT infrastructure 	4.8%	6.37
6.	TOTAL	100%	135.00

3.2.2: Land Use Disposition

The placement of the functional areas within the park was informed by the land use planning principles and suitability analysis that looked into issues such as adjacent land uses, slope and geology, wind paths among others. Based on compatibility dynamics, similar functions were clustered with respect to services demands, amount of energy demands and servicing. As a result, the light heavy industries were co-located in the northwest section, light industries in the eastern block, the logistics centrally located. This applied to open spaces and incubation locations. The spatial representation of this disposition is indicated in the land use plan (Figure_5 below.)



Figure 5: Industrial Park Land Use Plan

3.2.3: Land Subdivision

The land subdivision for the park adheres to Uasin Gishu County government Land Use zoning guidelines and the development application subject to Physical Planning Act Cap 286 of 1996, section 33. The industrial park occupies a total of approximately 135 acres of land. The area is zoned for industrial use by the Uasin Gishu County Land Use guidelines and designated under Block 15/1757. Under this zoning, the minimum plot size allowable for such industrial use is one acre. Therefore, the subdivision scheme for the industrial park has adopted the minimum 1-acre guideline.

As a result, a total of 116 plots have been realized of which 73 are exactly one acre. The remaining 43 are larger in the range of 1.04 to 1.56 acres, mainly due to factors such as location (corner plots), accommodation of easements, wayleaves and the irregular site morphology. For sustainability purposes, the subdivision scheme for the park conformed to minimum frontages of 50 metres for all industrial properties to ensure accessibility of all the functional areas (plots). Using a system of loops, the circulation strategy ensured that each plot is accessible without compromising their serviceability and cost-effectiveness. Spatial representation of the subdivision plan is presented in the figure 6 below:

Figure 6: Land Subdivision Plan



3.2.4: Industrial Prototypes and Clusters

The proposed industrial park is largely envisaged to be an agro-industrial park, which aims at increasing income and access to food. The proposed park accommodates five industrial prototypes. The proposed industries have been assessed for viability and categorized in target sectors as shown in table 4 below.

Table 4: Summary of Proposed Industries

INDUSTRY	INDUSTRIAL ACTIVITIES
1. Food processing Industries	<ul style="list-style-type: none"> — Meat and meat products — Dairy and dairy products — Vegetable oils and fat — Fruits and vegetables processing and packaging — Grains and cereals milling and related products — Bakery and wheat products — Animal Feeds
2. Agro-based industries	<ul style="list-style-type: none"> — Fertilizer production — Agro veterinary chemicals — Farm equipment

3. Textile Industries	<ul style="list-style-type: none"> — Textile fabric and yarn production — Garment manufacture — Manufacture of accessories — Embroidery — Fabric Manipulation — Washing — Screen printing services
4. Service and logistics	<ul style="list-style-type: none"> — Cold rooms — Go-downs/ warehouses — Logistics and business outsourcing — Production of packaging materials — Waste recycling plant — Steam plant and boilers
5. Processed Leather industry	<ul style="list-style-type: none"> — Shoe making and leather products

The above five main clusters have further been categorized into two main industrial typologies i.e. light heavy industries and light industries. The Light Heavy Industries comprises primary processors, secondary processors and tertiary processors based on their value chain systems e.g. processed leather industries, farm equipment manufacture, fertilizer manufacture, Agro-vet drugs/chemicals, Industrial equipment – (agro-machinery, farm equipment assembly) etc. The Light Industries cluster consists of two main industrial activities, namely food processing and textile industries such as sugar processing and packaging, bakery and wheat products, meat and meat products, pork and bacon products etc.



Figure 7: Proposed Typical Agro Industry

The Research and Incubation Cluster will accommodate institutions specialized in industrial research and development and training young industrial ventures. Some of the targeted entities include the Kenya Industrial Research Development Institute (KIRDI), Moi University, Eldoret Polytechnic, and KAM Research. The Commercial Cluster is provided to

complement the industrial functions. Some of the commercial provisions in the park include: restaurants and fast-food outlets, convenience stores, banks, travel agencies etc.



Figure 8: Typical Textile Industry



Figure 9: Logistics Prototype

3.2.5: Transportation and Infrastructure

The proposed transportation system and level of accessibility will be a major influence on the basic function and form of the proposed park. There are three hierarchy of roads for the park, namely KURA-1 road within a 30m way-leave traversing the park as a north-south spine; primary industrial stand access (PISA) roads within a 20m way-leave, and secondary industrial stand access roads (SISA), within a 15m way-leave. All roadways within the Industrial Park are of two lanes (one in each direction).

The industrial park is strategically located with good access to key infrastructure like roads, power and sewer. Potable water and waste water systems have been designed for optimization and conservation of the available water resources. Electricity supply shall primarily be from the national grid with proposals for future alternative sources from solar and biomass. In the long run, it is proposed that bio-energy carriers waste is tapped for energy production i.e. electricity and heat for utilization within the industrial park.

3.3: CHAPTER SUMMARY

Based on land use integration, the park has adopted a mixed-use approach as opposed to exclusive zoning meant to compliment the industrial function. This has promoted a system of well-balanced and self-sustaining park in terms of operations and service provision thus aiming to be a leading frontier in industrial estate design, setting standards in sustainability, social amenity and building efficiency.

The park has employed design concepts meant to promote ecological sustainability. This has been attained through design of green commercial and industrial buildings, which are energy efficient buildings, flexible and adaptable to multiple uses. Efforts to minimize waste generation and disposal through effective management of the same has been achieved through the 3Rs waste management strategies. Efficient and effective waste management has been established through setting out of proper development control policy and institutional frameworks for waste management and Environmental Management Plans.

Energy efficiency on the other hand has been enunciated within the park through exploration in utilization of multiple energy alternatives that are eco-friendly/clean and affordable such as solar, biogas, biomass etc. Energy cascading as key principle in sustainability of the park has been realized through a well-balanced energy transfer network with respect to clustering of compatible functions and use of value chain system to enable cohesive and harmonious operations.

The Eldoret ICDC Industrial Park layout and in the long run its operation has been developed with an overall goal to achieve ecological quality and ecosystem integrity. Various industrial prototype buildings and infrastructure designs are aimed at conserving the natural and economic resources; reducing production, material and energy, improving operating efficiency, quality, worker's health as well as creating opportunities for income generation from use and sale of waste materials. Socio-economically, the park is envisaged to create new job opportunities (for both gender/race/tribe/groups) through local utilization and management of natural resources and establishment of business opportunities among different industrial clusters. Moreover, one of the key objectives of the park is nurturing start-up ideas, technological innovations and experimentation of the same. Thus, an incubation zone has been proposed which will accommodate institutions specialized in industrial research and development and training young industrial ventures.

Landscaping and green infrastructure has been generously provided within the park mainly for improving environmental quality as well as boosting the image of the park. Orienting development of various industrial clusters towards green space is geared to capture value and integrate natural and the built form. Landscaped green areas, tree planting and amenity strips along streets, major transport corridors and walkways have been provided to soften the man-made environment. Trees and vegetation main role is to act as carbon sinks subject to *Kyoto Protocol*, targeting absorbing CO₂ emission from the heavy industries and motorized vehicles. Lastly, establishing a network of green corridors promotes eco-friendly modes of transport such as walking and cycling.

In conclusion, the Eldoret ICDC Industrial Park has observed socio-economic and environment-friendly concepts/ principles by hosting a community of manufacturing and service businesses seeking to enhance environmental and economic performance through collaboration in managing environmental and resource issues, including energy, water and materials.

CHAPTER FOUR POLICY, LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK

4.1: OVERVIEW

This chapter presents a detailed review of policy, legal, regulatory and institutional frameworks that have informed the preparation of this report. Specifically, the review integrates the international, national and sectoral policies and principles into the study and compliance with the existing policies and laws. The review further identifies indicators and legally acceptable thresholds and standards for environmental quality such as air, water, noise, radiation, solid and liquid waste and protection of sensitive ecosystems.

4.2: POLICY FRAMEWORK

4.2.1: International Policies

a) Sustainable Development Goals, 2015

Kenya is a signatory to the SDG programme of which in October 2015, the United Nations adopted 17 Sustainable Development Goals aimed at transforming the world. Eleven of these goals have some bearing on the EIIP Master Plan. They include Goal number 1 aiming at reducing poverty; Goal 2, reducing hunger; Goal 3, good health and wellbeing; Goal 4, clean water and sanitation; Goal 7, affordable clean energy; Goal 8, decent work and economic growth; Goal 9, Industrial growth, innovation and infrastructure; Goal 11, sustainable cities and communities; Goal 12, responsible consumption and production; Goal 13, climate action; and Goal 15, life on land. As described in chapter three and ten of this report, the master plan has addressed each of these 11 Goals in its plan components and infrastructure.

b) United Nations Framework Convention on Climate Change (UNFCCC)

UNFCCC of 1992 objective is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" The framework set no binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to set binding limits on greenhouse gases.

The execution of these obligations implies that industrial park implementation process requires the human, organizational, institutional and scientific resources for developing and implementing the tasks and functions that reduce emission of GHG. This SEA report has determined and put in place measures to minimize the emissions of GHGs through appropriate technologies like gaseous emissions neutralization and ample green cover to act as carbon sequestration mechanism.

c) United Nations Convention on Biological Diversity

The purpose of this convention is to ensure the conservation and sustainable use of biodiversity. Kenya signed the convention on 5th June 1992 and ratified the same on 26th

July 1992. The National Environment Management Authority (NEMA) is the national focal point to this Convention. The provisions of this convention have been integrated in many laws of Kenya such as Wetlands, Riverbanks, Lake Shore and Sea Shore Management Regulations, 2009 (Legal Notice No. 19)

The industrial park proposes the establishment of industrial investments that are agro-based whose operations have direct implications on the natural plant biodiversity through the utilization of raw materials and industrial processing. This SEA report and the proponent of the park have identified measures to improve biodiversity through measures such as conserving the riparian reserve, landscaping and use of bio-swales to prevent surface runoff and flooding.

d) Ramsar Convention on Wetlands

The Ramsar Convention on Wetlands is primarily concerned with the conservation and management of Wetlands. Parties to the convention are required to promote prudent use of wetlands within their territories and to take measures for the conservation of the same. One way to conserve the wetlands (as proposed under this convention) is establishing nature reserves whether they are included in the Ramsar list or not.

The park is expected to observe and adhere strictly to the Ramsar Convention's principles of prudent use of wetlands especially in controlling developments along the riverine areas particularly because the park lies in close proximity to a river whose source is an underground spring that requires protection. The Master Plan and SEA proposes measures to conserve this wetland area that include greening of the riparian reserve and the use of bio-swales to promote infiltration of surface run off back into the aquifer.

e) Agenda 21

The Agenda 21 entails a comprehensive plan of action to be undertaken globally, nationally and locally by organizations affiliated to the United Nations, governments, and other groups in every area in which human's impacts on the environment. Kenya continues to implement Agenda 21 plan of action by incorporating its principles in national policies, plans, programmes and strategies. The provisions have also been incorporated in the Master Plan to promote sustainable development, which comprises of the three (3) underlying tenets of economic, social and ecology, which are well articulated in the SEA (specifically section on Environmental and Social Management Plan).

4.2.2: National Policy Framework

a) Kenya Vision 2030

As the country's development blueprint covering the period 2008-2030, Vision 2030 aims to achieve a "globally competitive and prosperous country with a high quality of life by 2030" (GOK, 2007). Specifically, Vision 2030 aims at transforming Kenya into "a newly industrializing, middle income country providing a high quality of life to all its citizens by the year 2030" (Ibid). The Vision describes six priority key sectors in acting as key growth drivers in the journey to 2030; among these is the manufacturing sector. In this regard, the Vision states that, the country aims to become the provider of choice for basic manufactured goods in eastern and central Africa, by targeting "niche" products e.g. organic foods and beverages. This, according to the Vision will be achieved by strategically increasing the level of value addition in niche exports by additional processing of local agriculture products.

On the environment front, Kenya aims to be a *nation living in a clean, secure and sustainable environment by 2030 (Kenya Vision 2030)*. Kenya will also enhance disaster preparedness in all disaster-prone areas and improve the capacity for adaptation to global climatic change. In addition, the country will also harmonize environment-related laws for better environmental planning and governance. Specific strategies will involve: promoting environmental conservation for better support to the economic pillar flagship projects. The application of economic incentives; and the commissioning of public-private partnerships (PPPs) for improved efficiency in water and sanitation delivery.

The principles of the industrial work is aligned to the ideals of Vision 2030 as it meets objectives of the economic and environmental pillars through offering economic opportunities and protection of the environment. The positive impacts of the park on employment, income generation and sustained social and health of the people and the area is covered in Chapter Nine of this SEA report.

The park shall play a key role in increasing value in agriculture by providing a platform for the processing of agro-produce within the county and the region. Value addition of agricultural produce shall increase the farmers' earnings and therefore enhance their livelihoods. Manufacturing for the East and Central African regional market shall be made possible through export production approach thus increasing the country's foreign exchange earnings.

Moreover, Vision 2030 strategy puts forward proposals in with promotion of ICT, gender balance and catering for persons with disabilities. All these aspects have been observed in the EEIP through provisions for all the socio-economic groups and the people with disabilities both through access to economic activities and building designs.

b) Draft National Industrialization Policy, 2010

The Kenya National Industrialization Policy framework, draft 5, 2010 recognizes that Kenya is primarily an agricultural based economy with fairly skilled human resource base and strategically located to serve as a regional industrial hub. The policy acknowledges the industrial sector best-positioned as a potential growth driver as identified in the Vision 2030 because, among other reasons, the sector enjoys strong forward and backward linkages with other important economic sectors such as agriculture and services; and offers high prospects for employment creation especially in labor-intensive industries (GOK, 2010).

The policy further recognizes the need to promote sustainable industrial development that upholds environmental protection, management and efficient resource utilization. The overall objective of this policy is to sustain the growth of the industrial sector and make Kenya the most preferred location for industrial investment. The Eldoret Park inherently proposes promotion of key objectives of the industrialization policy, that is, to sustain the growth of the industrial sector. In regard to environmental sustainability, the policy recognizes the need to promote sustainable industrial development that upholds environmental protection, management and efficient resource utilization; a key principle of the Master Plan. Recognition and mitigation of possible negative impacts on the environment are contained in Chapter Nine of this SEA report.

c) Draft National Environment Policy, 2013

The draft National Environment Policy upholds the tenets of environment management and planning in Kenya by tracing the same to the Rio Earth Summit of 1992, which helped a

great deal in raising the understanding of the link between environment and development (GOK, 2013). The policy recognizes the importance of the link between development and sustainable environment by stating the key principles, among others;

- Promotion and support SMEs and other industries to adopt appropriate environmentally sound technologies through provision of appropriate incentives and disincentives
- To develop and promote use of strategic environmental assessment in the industrial development plans, policies and programmes.

Overall, the government recognizes the need to integrate environmental concerns in all policy, planning and development processes. It states thus in the policy document, "Integration of environmental considerations in all national, county and relevant sectoral policies, planning and development processes is critical if this policy is to achieve its goal and objectives' (GOK, 2013). This SEA report is geared towards showing how the proposed industrial park fulfills and complies with the provisions of the Environmental Policy. Chapter Nine of this reports details all the possible impacts of the implementation of the plan and shows how the negative impacts will be mitigated.

d) National Environment Action Plan, 2009

The National Environment Action Plan recognizes the environmental challenges facing industries, among others as; generation and management of solid, liquid and hazardous waste; gaseous emissions; adoption of cleaner production technologies and compliance with EIA/EA,, waste and water regulations; importation of obsolete technologies,, unregulated importation of toxic and hazardous chemicals,, air and noise pollution,, inappropriate technology in energy production,, poor planning in respect to industrial and residential areas. The National Action Plan proposes, among others, the following interventions: enhance use of cleaner production systems, finalize and implement regulations on toxic and hazardous chemicals and finalize and implement regulations on noise pollution.

This SEA report clearly shows how the above propositions are tackled by the Master Plan according to the provisions for implementation of EMCA 1999 and the associated environmental regulations. Chapter Nine of this report details all the possible impacts of the implementation of the park activities and shows how the negative impacts will be mitigated.

e) Sessional Paper No. 3 of 2009 on National Land Policy

The National Land Policy was formulated to provide an overall framework and define the key measures required to address among others, the critical issues on land, land use planning, environmental degradation, conflicts and unplanned proliferation of informal urban settlements, outdated legal framework, institutional framework and information management. The policy further encourages a multi-sectoral approach to land use, provision of social, economic and other incentives and put in place an enabling environment for investment, agriculture, livestock development and the exploitation of natural resources. The main objective of the park is enhanced economic development but has incorporated environmental sustainability considerations in allocation of the 135 acres of land to the various industrial and commercial land uses. Specific and detailed impacts, mitigation and strategies to enhance acceptability and appropriateness of the park activities are contained in Chapter Eight, Nine and Ten of this report.

f) National Water Policy, 2012

The National Water Policy is informed by the gains made during the past decade on implementation of reforms in the water sector as anchored on the National Water Policy of 1999 (NWP 1999) also referred to as Sessional Paper No. 1 on National Policy on Water Resources Management and Development, the Water Act 2002, existing related policy documents, and the globally recognized Integrated Water Resources Management (IWRM) approach (GOK, 2012).

The policy aligns itself to the constitution in regard to creation of a system of democratic governance in which powers are devolved both vertically and horizontally in efforts to take measures to achieve the progressive realization of the cultural and socio-economic '*rights to water*', an enabler of wealth creation and poverty alleviation. (GOK, 2012). Most importantly, the key principle of the policy is to ensure a comprehensive framework for promoting optimal, sustainable, and equitable development and use of water resources for livelihoods of Kenyans' (GOK 2012). In regard to the park, provisions are incorporated to ensure protection of the affected water resources, supply and efficient utilization of water resources as well as the safe disposal of wastewater.

g) Sessional Paper No. 2 of 2009 on Forest Policy

The Forest Policy requires County Governments) to establish and maintain arboreta, mini-forests or mini-recreational parks within their areas of jurisdiction and during construction of housing estates by the public and private investors. This could also be extended to Industrial Parks. Developers are also required to plant trees on both sides of road reserves. The Forest policy also aims to promote wood based industries to manufacture diverse finished products for local and export market. Trees absorb carbon-dioxide, pollutants particularly sulphur-dioxide, absorb noise, provide shade, cools the environment and improves aesthetics within the urban environment. Promotion of wood based industries has backward linkages to the farms for supply of wood. This will lead to increased employment and incomes for farmers.

The EIIP Master Plan has provided 10.4 acres of land (7.7% of the total) for green/open space. In addition, the plan has provided for all roads, pedestrian walkways and parking spaces in the park to be lined with trees. Unutilized spaces in individual plots will also be greened. This will significantly increase the proportion of trees in the park. Wood based industries have been included in the list of possible industries therefore, the policy is sufficiently provided for.

h) Sessional Paper No. 2 of 2008 on Livestock Policy

Livestock farming, is the mainstay of most rural households. It contributes significantly to the livelihoods of the citizenry of this country. The sub-sector accounts for about 10% of the entire GDP and about 42% of the agricultural GDP. It also supplies the domestic requirements of meat, milk and dairy products, and other livestock products while accounting for about 30% of the total marketed agricultural products. The sub-sector earns the country substantial foreign exchange through export of live animals, hides and skins, dairy products, and some processed pork products. It also employs about 50 percent of the country's agricultural sector labour-force. The sub-sector also contributes substantial earnings to households through sale of livestock and livestock products; and provides raw material for agro-industries. Of the total dairy cattle milk production, about 55% is

marketed through traders, cooperatives, hotels and shops. An estimated 84% of the total milk production is sold in the raw form, while only 16% is processed.

Currently, Kenya's livestock sub-sector is based on primary production. There is very little on-farm and off-farm processing of livestock produce, and this translates to low income for farmers and loss of employment opportunities. Value addition initiatives in the livestock sub-sector are mainly constrained by lack of supportive infrastructure such as roads, electricity, and water, in addition to investment disincentives arising from high taxes and un-conducive regulatory frameworks. The overall aim of the livestock policy is to facilitate enhanced and sustainable growth of the livestock sub-sector. It intends to guide development of the sub-sector to increase household incomes, assure food security and create employment through improved livestock farming, value addition of products and support of livestock-based industries, among others.

The EIIP Master Plan has identified the livestock products agro-processing as one of the key industries for the park. The livestock sector will therefore provide raw materials for the Industrial Park while the park will provide a market for the sector hence creating a strong synergy.

i) Energy Policy, 2012

The broad objective of the national energy policy is to ensure adequate, quality, cost effective, and affordable supply of energy to meet development needs while protecting and conserving the environment. The specific objectives are to:

- Provide sustainable quality energy services for development
- Utilize energy as a tool to accelerate economic empowerment for urban and rural development
- Improve access to affordable energy services
- Provide an enabling environment for the provision of energy services
- Enhance security of energy supply
- Promote development of indigenous energy resources, and
- Promote energy efficiency and conservation as well as prudent environmental, health and safety practices

The park has incorporated use of renewable energy, designed green buildings that will optimize use of solar energy, has included generation of energy from solid waste hence contributing to conservation of conventional energy forms.

j) Public Health Policy, 1994

The Kenya Health Policy Framework set out the policy agenda for the health sector up to the year 2010. The policy includes strengthening of the central policy role of the Ministry of Health (MOH), adoption of an explicit strategy to reduce the burden of disease, and definition of an essential cost-effective healthcare package. To operationalize the health policy framework, the paper on National Health Sector Strategic Plan (NHSSP, 1999-2004) was developed in 1994. The plan focused on the essential priority packages based on the burden of disease and the required support systems to deliver services. Major players in the health sector include the government represented by the Ministry of health and the local government, private sector, and non-governmental (NGOs).

The implementation of the devolved system of government has led to the active involvement of the lower levels of government albeit with major challenges. The role of the county governments includes implementation of the health policies, maintaining quality standards, and coordinating and controlling all county public health activities. Public health challenges in urban areas revolve around poor sanitation, unhygienic environment, and non-adherence to planning and building regulations. The park provides for enhanced physical environment within the park and its surroundings, including guidelines for management of solid and liquid waste, ensure that building standards are adhered to and enhance conservation of the stream adjacent to the park.

4.3: LEGAL FRAMEWORK

a) Constitution of Kenya, 2010

The Constitution is the supreme law of the land. It lays the foundation on which the wellbeing of Kenya is founded. The constitution's provisions are specific to ensuring sustainable and productive management of land resources; transparent and cost effective administration of land; and sound conservation and protection of ecologically sensitive areas. Specifically, Chapter 2 Part 4, on the Bill of Rights, section 42 provides that every person has the right to a clean and healthy environment, which includes the right: (a) to have the environment protected for the benefit of present and future generations through legislative and other measures. Article 69 outlines specific provisions on the environment; subsections (d) encourage public participation in the management, protection and conservation of the environment, and g) provides for elimination of processes and activities that are likely to endanger the environment.

The Master Plan has made provisions to ensure a clean and healthy environment through the environmental and social management plan. Provisions for optimal utilization of natural resources particularly water and energy through promotion of efficient utilization and regular water and energy use audit are contained in the plan. The document further provides for the management of solid and liquid wastes, reduced pollution and management of the natural Cherunya stream.

b) Environment Management and Coordination Act, No. 5 of 2015

EMCA, 2015 describes the legal and institutional framework for environmental management. General principles of the Act are that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. The entitlement to a clean and healthy environment includes the access by any person in Kenya to various public elements or segments of the environment for recreational, educational, health, spiritual and cultural purposes. There are a number of regulations that stem from EMCA which have significance to this SEA study. These are discussed below:

c) Environmental (Impact Assessment and Audit) Regulations, 2003

The Environmental (Impact Assessment and Audit) Regulations, state in Regulation 3 that "the Regulations shall apply to all policies, plans, programmes, projects and activities specified in Part IV, Part V and the Second Schedule of the Act". (ER-EIA, 2003). Section 42 and 43 address Strategic Environment Assessments; section 42(1) requires lead agencies in consultation with NEMA to subject all policy, plans and programmes for implementation to

a Strategic Environment Assessments while regulation 42 (3) commits the government and all lead agencies to incorporate principles of SEA in the development of sector or national policy.

- *Air Quality Regulations, 2013 (Legal Notice No. 34)*: These regulations spell out levels of ambient air quality standards that should not to be exceeded. Part II prohibits an individual from causing immediate or subsequent air pollution. Section 6 states that “no person shall cause or allow emission of the priority air pollutants prescribed in the Second Schedule of the regulations to cause the ambient air quality limits prescribed in the First Schedule to be exceeded” (AQR, 2013).
- *Waste Management Regulations, 2006 (Legal Notice 121)*: These regulations provide for the management of waste. Part II regulation 4 (1) provides that no person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated receptacle; regulation 4 (2) further states that a waste generator shall collect, segregate and dispose such waste in the manner provided for under these regulations and finally; and regulation 5 (1) provides for cleaner production methods. It states that a waste generator shall minimize the waste generated by adopting the following cleaner production methods:
 - Improvement of production process through: Conserving raw materials and energy; Eliminating the use of toxic raw materials; and Reducing toxic emissions and wastes;
 - Monitoring the product cycle from beginning to end by: Identifying and eliminating potential negative impacts of the product; Enabling the recovery and re-use of the product where possible; and Incorporating environmental concerns in the design and disposal of a product.

This SEA report has incorporated the Environmental and Social Management Plan and Environmental Monitoring Plan to ensure that the waste management regulations are complied.

- *Water Quality Regulations, 2006 (Legal Notice No. 120)*: This regulation has provisions for ensuring water quality standards by actors and players in the water sector. Regulation 8 provides for all operators and suppliers of treated water, containerized water and all water vendors to comply with the relevant quality standards in force Regulation 9 provides for water quality monitoring and states that the Authority in consultation with the relevant lead agency, shall maintain water quality monitoring for sources of domestic water at least twice every calendar year.
- *Controlled Substances Regulations, 2007 (Legal Notice No.73)*: According to these regulations, producers and/or importers of controlled substances are required to include a material safety data sheet. Persons are prohibited from storing, distributing, transporting or otherwise handling a controlled substance unless the controlled substance is accompanied by a material safety data sheet. Manufacturers, exporters or importers of controlled substances must be licensed by NEMA. Further, any person wishing to dispose of a controlled substance must be authorized by NEMA. The licensee should ensure that the controlled substance is disposed of in an environmentally sound manner. These regulations also apply to any person transporting such controlled substances through Kenya. Such a person is required to obtain a Prior Informed Consent (PIC) permit from NEMA.

Persons handling controlled substances are required to apply for a permit from NEMA. Any licensee who imports or produces any controlled substances is required to ensure that all persons who receive or buy such substances sign a declaration form. Where an imported controlled substance does not meet set specifications, NEMA shall require the licensee to return the controlled substance to the country of origin at his/her cost or pay to NEMA the cost of disposing of the controlled substance. The EEIP Master Plan and this SEA report and specifically the Environmental and Social Management and Monitoring Plans have incorporated the handling of controlled substances to ensure safety of all the actors reduced harm and/or injury is caused to the people working in the sector and to the environment. (Chapter Nine)

- *Wetlands, Riverbanks, Lake Shore and Sea Shore Management Regulations, 2009 (Legal Notice No. 19)*: Management of wetlands is guided by the following principles:
 - Resources on the river banks, lake shores and the sea shore shall be utilized in a sustainable manner;
 - Environmental impact assessment as required under the Act shall be mandatory for all major activities on river banks, lake shores and the seashore; and
 - Special measures, including prevention of soil erosion, siltation and water pollution will be enforced.
 - Section 9 clause 2(c) provides that a strategic environmental assessment be conducted for specific wetlands management plans.
 - On use of wetlands, section 11 (1 and 2) details the activities permitted and environmentally sound to ensure sustainable management of the wetlands.

The Master Plan has factored prevention of soil erosion, siltation and pollution of water resources to ensure sound environmental health of Cherunya stream, a management plan for its conservation will be prepared. The plan has incorporated guides for landscaping and greening in efforts to reduce possible erosion into the stream resulting from the increased water runoff from the park. Secondly, adequate measures have been taken to ensure no liquid waste is discharged into the stream without proper care and treatment.

- *Noise and Excessive Vibration Pollution (Control) Regulations, 2009 (Legal Notice No. 25)*: These rules provide for the noise regulations that apply to every factory, premises, place, process and operations to which the provisions of the Factories and Other Places of Work Act (Cap 514) apply. Section 1.4 of the legislation details the permissible levels of noise in a work place; section 5 and 6 elaborate on the recommended noise prevention programme as well as measurement and records to be undertaken by the contracted company during construction and operational phases of the project.

A great amount of noise and vibrations are expected in the activities proposed for implementation of the industrial park and these regulations will serve as guidelines to the investors. Specifically, the SEA has incorporated the Environmental and Social Management Plan that will ensure the tolerable Limits of Noise and Vibrations are not exceeded and that the recommendations in the regulations are adhered to.

d) County Government Act, No 17 of 2012

The County Government Act aims at giving effect to chapter 11 (Devolution) of the constitution and provides for the county government powers, functions and responsibilities in the delivery of services and for connected purposes. The act emphasizes the need for a consultative and participatory approach where the principles of planning and development facilitation in a county serve as a basis for engagement between the county government and the citizenry, other stakeholders and interest groups (Article 102 (i)). An important feature of SEA is that it is a participatory process whose hallmarks are public participation and stakeholder consultations to ensure that all their environmental and social concerns are incorporated. Therefore, individuals and institutions directly or indirectly affected by implementation of the EEIP Master Plan are entitled to express their interests and have them respectively taken into consideration in the decision-making process.

e) Urban Areas and Cities Act, CAP 275 of 2012

Article 22 of this act provides for Citizen Forum. Secondly, according to the 2nd Schedule, residents of a city, municipality/town may deliberate and make proposals to the relevant bodies or institutions on the provision of services or plan strategies for engaging the various levels and units of government on matters of concern to citizens.

f) Physical Planning Act, Cap 286 of 1996

The Act's main objectives are inter alia to provide for proper coordination between the different levels of government in the preparation and implementation of the various physical development plans. Part IV of the act specifically provides for the preparation of physical development plans for the selected area and selected purpose for the concerned administrative unit, while Part V, on "control of development" provides for powers of planning authorities in development permission including application and approval of development proposals.

The above are crucial tools in development control whose application may not be forthcoming in short term, that is, implementation of the provisions of the plan and park activities. However, the tools have been included in this report to enable the investors and other players of their importance in development and possible application in the long term, particularly change of user and extension of use. (Development control guidelines for developers are provided for in Chapter Nine)

g) National Land Commission Act, CAP 5 of 2012

The Act provides for the functions and powers of the National Land Commission, which among others gives effect to the Constitution, the objects and principles of devolved government in land management and administration, and for connected purposes. In relation to the SEA study, this Act provides for:

- The management and administration of land in accordance with the principles of set out in Article 60 of the Constitution and the national land policy,
- A linkage between the National Land Commission, county governments and other institutions dealing with land and land related resources

Section 19 (1) provides that the commission shall, subject to the physical planning and survey requirements, process applications for allocation of land, change and extension of user, subdivision of public land and renewal of leases.

h) Energy Act, CAP 314 of 2006

The Energy Act was enacted to amend and consolidate the laws relating to energy, to provide for the establishment, powers and functions of the Energy Regulatory Commission (ERC) and the Rural Electrification Authority (REA), and for connected purposes.

Important to this SEA study is section 98, which provides for compliance with environmental, safety and health standards for any person engaged in petroleum business. Further, section 98(2) provides for cleaning up of polluted or damaged environment, in the event of a fire, explosion, oil spill, injury or fatality occurring in the course of operating a petroleum facility or transportation of petroleum, either by accident or through negligence, to the satisfaction of the commission and other relevant authorities. The Master Plan and this SEA study (see section Environmental Management and Social Management Plan) re-emphasize the provisions of this act during the pre- and post-implementation phases of the project. The possible negative and positive impacts of this project are detailed in the SEA report and presented in Chapter Eight, Nine and Ten.

i) Forests Act 2005

The Forests Act is an Act of parliament to provide for the establishment, development and sustainable management including conservation and rational utilization of forest resources for the socio-economic development of the country. The Act provides for the creation of the Kenya Forest Service with the responsibility to: i. Provide forest extension services by assisting forest owners, farmers, and associations in the sustainable management of forests; ii. Promote the empowerment of associations and communities in the control and management of forests. iii. Manage forests on water catchment areas primarily for purposes of water and soil conservation, carbon sequestration, and other environmental services.

The EIIP Master Plan will immensely benefit directly and indirectly from the services of the Kenya Forest Service as provided for in the Forests Act. The direct benefits are from technical advice on the tree and shrub species to plant and how to manage them and indirectly from promotion of commercial forestry among the farming communities particularly for the supply of wood and other forest raw materials to the Industrial Park.

j) Building Code of 1997

According to this code, prior to erection of buildings, an application, submission of plans and payments of fees are to be made to the local authority. It also contains requirements relating to certificates for occupation of premises. These are adoptive by-laws under the now repealed Local Government Act and are under revision. The code's provisions shall be adhered to thus;

- Establishing of standards for building as workspace is crucial for integration of these needs into the industrial park development agenda.
- Co-ordination between the various lead agencies, both government and county authorities is crucial to provision of direction to developers and investors of EIIP.
- Enforcement of these directives would also require sensitization and empowerment of the County Engineer's Department.

In order to mitigate against the potential environmental impacts of the proposed developments in the park, such as noise, dust and vibrations, the SEA has provided for appropriate EMMP. These developments shall equally have social and economic implications whose impacts have to be determined by the SEA and measures to mitigate against the negative impact and promotion of the positive impacts put in place.

k) Water Act, Cap 372 of 2007

The Act provides regulations for the management and development of water resources, water supply and sewerage development in all parts of the country with the objective of conserving, protecting and allocating such resources in order to meet the various needs while ensuring safe disposal of wastes. Part II, section 18, of the act provides for national monitoring and information system on water resources while sub-section 3 allows the Water Resources Management Authority (WRMA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Furthermore, the act vests the rights of all water to the state, and the power for the control of all bodies of water with the Minister, in consultation with the water catchments boards, it aims at among others: (i) provision of and conservation of water; and, (ii) apportionment and use of water resources.

The Master Plan has made provisions for conservation of the adjacent water source. This SEA report contains an Environmental and Social Management Plan to ensure efficient utilization of the water resource both within the industrial park and conservation of the nearby Cherunya stream.

l) Occupational Health and Safety Act (OSHA), 2007

This is an Act of Parliament, which provides for the safety, health and welfare of all workers and all persons lawfully present at workplaces. The act further provides for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The act repealed the Factories and Other Places of Work Act. It applies to all workplaces where any person is at work, whether temporarily or permanently and therefore will apply to the project both during construction and operation phases.

The scope of OSHA has been expanded to cover all workplaces including offices, schools, academic institutions and plantations. It establishes codes of practices to be approved and issued by the Director, Directorate of Occupational Health and Safety Services (DOHSS) for practical guidance of the various provisions of the Act.

Other parameters within the act relevant to the project include:

- Duties of employers, owners or occupiers of workplace;
- Establishment of safety and health committees;
- Annual safety and health audit of workplaces;
- Safety and Health obligations for persons who may come to premises for work and are not employees of that particular workplace;
- Reporting of any accident, dangerous occurrence or occupational poisoning caused in the workplace to the area Occupational Health and Safety Office. These incidents should be entered in the General Register. In case of a fatal accident information to the area Safety and Health Office should be within 24 hrs. and a written notice to the same within 7 days;

- The duties of manufacturers, designers, importers and suppliers to ensure that all articles and substances for use at workplace are safe and will not cause injury to health and the environment;
- Prohibition of interference or misuse of any appliance, convenience or any other facility provided to secure Safety, Health and Welfare at work by any person (occupier, self-employed person or employed);
- The administration of the act is the responsibility of a Director and other appointed and gazetted officials (Occupational Health and Safety Officers);

The master plan and the SEA study has recommended the establishment of a department mandated with the development and enforcement of a health and safety policy framework to promote occupational health and safety as well as community health and safety mechanisms. This mandate should be accompanied with the requisite capacity building interventions, which may include specialized training for staff as well as targeted recruitment to enhance the existing expertise. On the same, Chapter Nine of the SEA report has identified the various potential negative impacts of the development/construction and operational stages and has proposed possible mitigation measures.

4.4: INSTITUTIONAL FRAMEWORK

a) National Environment Management Authority (NEMA)

The authority is the key agency in charge of coordination of environment management activities, ensure compliance environmental guidelines and advise government on legislative and measures concerning environment management.

For purposes of the master plan and SEA study, the authority has to ensure compliance by the project proponent. This is done with a view to ensuring the proper management and rational utilization of environmental resources, on sustainable yield basis, for the improvement of the quality of human life in the project area. NEMA a key player in all environmental matters in the country, and is the approving authority of the SEA and EIA studies/reports prepared under this project.

b) National Environment Council (NEC)

The National Environment Council (NEC) is established under Section 4(1) of the Environmental Management and Coordination Act no. 8 of 1999. The key functions of the Council, among others, include:

- Set national goals and objectives and determine policies and priorities for the protection of the environment;
- Promote cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes

c) National Environmental Complaints Committee

The functions of the Complaints committee are to:

- Investigate any allegations or complaints against any person or against the Authority in relation to condition of the environment in Kenya; or on its own motion, any

suspected case of environmental degradation, and to make a report of its findings together with its recommendations thereon to the Council;

- Prepare and submit to the Council, periodic reports of its activities, which report shall form part of the annual report on the state of the environment under section 9(3); and
- Perform such other functions and exercise such powers as may be assigned to it by the Council.

d) County Environment Committee

Under the Environmental Management and Co-Ordination (Amendment) Act, 2015 No. 5 of 2015, County Environment Committee is constituted by the Governor in consultation with the relevant county organs. The role of the committee includes the proper management of the environment within the county and developing a county strategic environmental action plan every five years. For purposes of this plan and SEA study, apart from being a key stakeholder, the county government shall provide an oversight role on issue of the during all the stages of the project.

e) Eldoret Water and Sanitation Company (ELDOWAS)

The Eldoret Water and Sanitation Company Limited (ELDOWAS) is a corporate entity established under Cap 486 of the laws of Kenya. The company is fully owned by the county government of Uasin Gishu (the public agency/body that took over the functions and operations of Eldoret Municipal Council under whose mandate the company was formed). The company is in charge of water supply in Eldoret town and its environs and is therefore expected to be the main supplier of water to the industrial park. The company is mandated with the management of sewerage system and is therefore expected to be monitoring quality of effluents at the treatment plants to ensure compliance with the set standards before they are discharged into their trunk sewer.

CHAPTER FIVE

PPP FRAMEWORK FOR THE PROPOSED INDUSTRIAL PARK

MASTER PLAN SEA

5.1: OVERVIEW

A number of policies, plans and on-going projects/programmes are linked to the proposed development, EIIP, under consideration in a number of ways including sharing common resources, sharing funding agencies and benefiting from common management institutions. The projects also find confluence with the programmes through sharing common objectives.

5.2: LINKAGE TO POLICIES

5.2.1: Vision 2030 SME parks flagship project

Kenya vision 2030 development of SME parks involves the development of five small and medium enterprise (SME) industrial parks in key urban centres. This flagship project has been expanded to 47 SME parks covering all the 47 Counties. The ICDC EIIP is a 135 acres vision 2030 pilot agro-processing SME Park located in Eldoret because of its high potential agricultural area and access to an International airport. Indeed, this flagship project is aimed to be an effective vehicle for attracting investment, creation of jobs, fostering technological transfer and innovation.

The master plan is for an agro-industrial park, which aims at adding value to agricultural products/intermediates/residues, both food and non-food, by processing into products, which are marketable or usable or edible; or by improving storability, or by providing the link from farm to the market or a part thereof. The predominant land use in the park is light industrial activities occupying 62% of land out of the total 135 acres. Commercial, road network, green/open spaces and utilities/amenities land uses occupy 6.3%, 19.2%, 7.7% and 4.8% of the total land respectively. Industrial typologies to be hosted within the park include: food processing industries, agro based industries, service and logistics, textile industries, and processed leather industries.

5.2.2: Kenya Industrialization Policy, 2010

The National Industrialization Policy (NIP) focuses on value addition and has prioritized seven (7) sectors out of the twenty-two (22) identified based on their potential for growth, employment and wealth creation and availability of national resource base. The seven (7) priority sectors are both labour intensive and medium-high technology sectors and include: agro processing, textile and clothing, leather and leather products, iron and steel, machine tools and spares, agro-machinery and pharmaceuticals.

The industrial park master plan is developed under the industrialization policy framework, which identifies industrial sector as a potential growth driver as identified in Kenya Vision 2030. Being an agro industrial park, the master plan accommodates among others: food-processing industries, agro based industries, service and logistics, textile industries, and processed leather industries. In addition, the park is envisaged to add value to agricultural produce, offer high prospects for employment creation, act as a catalyst for technology

transfer and attraction of Foreign Direct Investment as well as offer high prospects for deepening Kenya's drive to integrate further into the regional and global economy.

5.2.3: Kenya National Environment Policy, 2013

This policy aims to provide a framework for an integrated approach to sustainable management of Kenya's environment and natural resources. In particular, it proposes to integrate environmental management with economic growth, poverty reduction and improving livelihoods, strengthening research and capacity development.

The proposed EIIP master plan has embraced the principles of eco-industrial park that focuses on achieving a community of manufacturing and service businesses that are keen on enhancing economic and environmental performance through collaboration in managing environmental and resource issues, including energy, water, and materials. The park conserves natural resources by promoting energy flows within the park through material and by-product exchange through re-use, reducing and recycling. It further creates room for job opportunities, nurturing and transfer of technology through incubation and local employments as well as enhancing research and technology transfer through cultivating start-up ideas, technological innovations and experimentation of the same.

5.2.4: Energy Policy, 2004

The national energy policy of 2004 gears towards ensuring sustainable, adequate, affordable, competitive, secure and reliable supply of energy to meet national and county needs at least cost, while protecting and conserving the environment. The policy seeks to promote energy efficiency and conservation. It identifies renewable energy as enablers to supply our needs and those of future generations in a sustainable way if effectively harnessed through careful planning and advanced technology.

Energy efficiency on the other hand has been provided for within the park through utilization of renewable energy alternatives that are eco-friendly/clean and affordable such as solar, biogas. Energy cascading as key principle in sustainability of the park has been realized through a well-balanced energy transfer network with respect to clustering of compatible functions and use of value chain system to enable cohesive and harmonious operations. Lastly, the industrial architecture proposed adopts a sustainable industrial building design that seeks to conserve the natural and economic resources; reducing production, material and energy, improving operating efficiency, quality, workers' health as well as creating opportunities for income generation from use and sale of waste materials.

5.3: LINKAGE TO PLANS

5.3.1: National Spatial Plan (2015-2045)

The Ministry of Land and Physical Planning launched the National Spatial Plan (NSP) 2015-2045 which gives guidelines on land planning and development. NSP aims at creating a spatial planning context that enhances economic efficiency and strengthens Kenya's global competitiveness, promoting balanced regional development for national integration and cohesion, optimizing utilization of land and natural resources for economic development as well as creating secure the natural environment for sustainable development.

Borrowing from NSP, the master plan has been designed to foster sustainable industrial development through an integrated approach that focuses on achieving a community of manufacturing and service businesses that are keen on enhanced economic global competitiveness and environmental performance. The land use plan for the park (light industrial, commercial, road network, green/open spaces and utilities/amenities land uses) promotes a balanced value chain principle. Thus, this enhances optimization and utilization of 135 acres of land and natural resources for economic development as well as creating secure natural environment for sustainable development.

5.3.2: Climate Change Action Plan (2013-2017)

In 2013, Kenya launched its National Climate Change Action Plan (NCCP) to address the options for a low-carbon climate resilient development pathway as Kenya adapts to climate impacts and mitigates growing emissions. These include: promoting irrigated agriculture, promoting conservation agriculture, value addition to agricultural products, intensified afforestation, promoting agroforestry-based alternative livelihood systems, promoting alternative energy sources among others.

In line with the on-going responses to climate change as per this plan, the master plan details out an agro-based industrial park that aims at adding value to agricultural products, protecting and conserving greenery and water catchment areas, promoting alternative energy sources such as solar, biomass among others. These interventions are aimed at directly and/or indirectly contributing to climate change adaptation and mitigation.

5.3.3: Uasin Gishu County Integrated Plan (2013-2017)

The proposed industrial park is located in Eldoret Municipality block 15/1757, Uasin Gishu County; a county whose economy is driven by agriculture: large scale wheat and maize farming, dairy farming and horticulture favored by fertile soils and regular rainfall. In addition, the County is strategically located within a network of transport infrastructure, opening the County to transit business to the land-locked countries (Uganda, Rwanda, and Southern Sudan). The standard gauge railway (SGR) is planned to reach Eldoret in 2017 further enhancing resources movement into and out of the County. Eldoret International Airport generates substantial opportunities for export business in Uasin Gishu County.

According to Uasin Gishu CIDP, various projects and plans initiated by Uasin Gishu County Government are directly aligned towards providing majorly raw materials to the proposed park. These projects/programs include:

- The County plans to irrigate approximately 40,000 ha (100,000 acres) of land under vegetable and fruit cultivation in a bid to expand agricultural production and earn extra returns to farmers. Structural and macroeconomic reforms and introduction of a more liberal trading environment has also provided a major boost to the county's horticultural prospects. The tremendous performance of the sub-sector presents an ideal opportunity for EIIP investment.
- County deliberate efforts to improve livestock production in terms of breeding, feeding, routine animal husbandry practices, marketing, pests and disease control.
- County supporting 300 hectares under fruit cultivation in Moiben and Turbo which can yield approximately 3,000 tons earning farmers Ksh.142, 928,000 per annum.
- County establishment of 31 nurseries currently managed by youth groups and Agricultural Training Centre (ATC) producing certified fruit seedlings.

- County promoting large scale floriculture in Moiben, Ainabkoi, Kesses and Soy through investing heavily on technical skills, production, logistics and marketing. This has seen the County earn Kshs. 500 million in 2014.
- County's 'Inua Mama initiative' strengthening poultry keeping and has identified 300 women in each ward to receive funding to set up the poultry projects. This aims at increasing production in the sector while improving the livelihoods of more than 9,000 households in the County.
- County establishment of cold storage, processing, packaging and marketing of agricultural and livestock produce such as potatoes, honey, dairy, fish, fruits and vegetable facilities as critical interventions in the sector from which the proposed EIIP is set to tap.
- County Government program of de-silting dams for irrigation. It is also revamping extension services with a view to addressing all supply-side constraints and increase production.

5.4: LINKAGE TO ONGOING PROJECTS/PROGRAMMES

5.4.1: Lamu Port-Southern Sudan-Ethiopia Transport (LAPSSET)

LAPSSET Corridor, is one of the infrastructure flagship projects identified by the Government of Kenya in Vision 2030 for fast-tracking. Under the Second Medium Term Plan (2013-2017), the Government plans to construct a new transport corridor covering rail, road and an oil pipeline from Lamu and connecting Kenya with Ethiopia and South Sudan. Eldoret (location of the proposed park) seeks to benefit from this project since the government has secured funding from the World Bank for the Construction of Lokichar-Nakodok road section (298kms) of the Eldoret-Kitale-Lodwar-Sudan Corridor.

The development of the LAPSSET corridor will open up the region for investment opportunities, which will ultimately lead to creation of job opportunities. The anticipated Lokichar-Nakodok road section (298kms) of the Eldoret-Kitale-Lodwar-Sudan Corridor will facilitate transportation of goods and services, create a considerable demand for goods and services in the area with a strong impact on economic activities in the hinterland and beyond that will be met by the Eldoret ICDC Industrial Park.

5.4.2: Standard Gauge Railway (SGR) Project

Kenya Railways Corporation is developing a new standard gauge railway (SGR) to connect Mombasa to Malaba on the border with Uganda and continue onward to Kampala, Uganda's capital city. The government has approved the second phase of SGR through Narok to link with the first phase that starts in Mombasa and passes through Nairobi and Naivasha. The Nakuru-Eldoret line passing through Kipkelion will be upgraded strategically located to serve among others, the proposed Eldoret Industrial park and for transferring freight by road to destinations along A104 (Naivasha, Nakuru – Eldoret).

The project is expected to reinvigorate existing urban centres such as Mombasa, Nairobi, Nakuru, Eldoret Kisumu among others due to business opportunities associated with such projects. Some of the benefits that the proposed industrial park will accrue with the completion of SGR include reduced cost of transportation of raw materials and finished products, thereby making it an attractive investment destination, ease trucks congestion within the Park hence making roads safer for human traffic and protection of the environment through reduced carbon emission.

5.4.3: Northern Economic Corridor (NEC) Project

Northern Economic Corridor (NEC) is a multi-modal corridor, consisting of road, rail, pipeline, and inland waterways transport, and is recognized as a significant corridor for logistics in East Africa. The main road network runs from Mombasa Sea Port through Kenya and Uganda to Rwanda and Burundi and to Democratic Republic of Congo (DRC).

The proposed industrial park lies at the heart of NEC, a major transit gateway that will advantageously provide a convenient transport solution for its food, agro-based, textile and leather products as well as strengthen its position as an economic and logistics hub to the North rift and East African sub-region through trade and regional economic integration.

5.4.4: Kenya's Industrial Transformation Programme (KITP)

KITP is the new Industrial Blueprint for Kenya's industrialization in which it evaluated the competitiveness of our manufacturing sector and areas that could be exploited in the short to medium term to bring about the desired economic transformation. The plan targets four key areas: an increase in manufacturing to over 15 per cent of GDP; the creation of 1 million jobs; a fivefold increase in foreign direct investment; and securing a top 50 position in the Ease of Doing Business Index.

The proposed industrial park master plan aligns to this program with the establishment of industrial prototypes such as food -processing, fisheries, textile and apparel, leather etc. aimed at value addition through agro-processing. The innovation and dynamism in EIIP will be a strong catalyst to effectively rolling out the KITP. The proposed project takes into account the current challenges faced by growing agro-based industries such as competition in global markets, value-addition to agriculture product, access to finance and low technological skills. It factors these in its goals with the aim of improving their access to markets through strengthening linkages as well as increasing their operational efficiency.

CHAPTER SIX

BASELINE ENVIRONMENTAL CONDITIONS

6.1: OVERVIEW

Baseline conditions describe the state of the environment before the onset of the proposed development. This section provides the state of the existing environmental conditions such as current physical status of the site, topography, rainfall pattern, temperature range, water supply and quality, geology, vegetation type, cover and land uses for the proposed Industrial park site. This is broadly categorized into the Physical Environment, Biological Environment and Socio-Economic Environment.

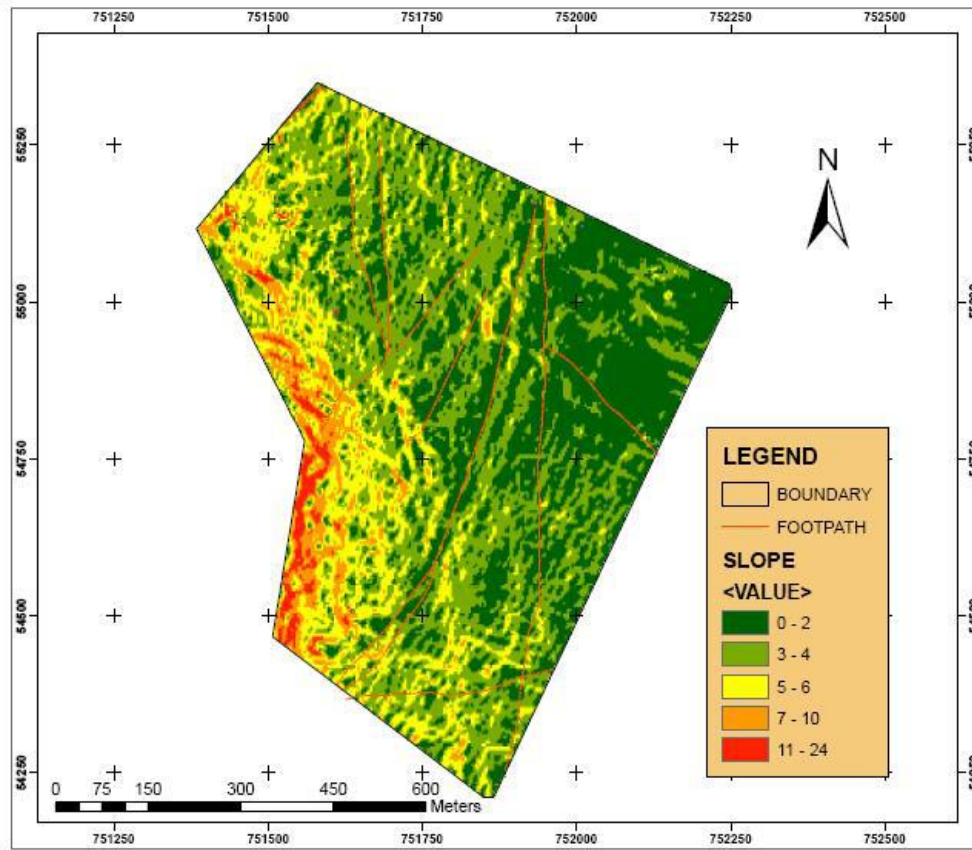
6.2: PHYSICAL ENVIRONMENT

6.2.1: Topography

The project site is generally flat. The proposed project site slopes towards the western boundary where the stream is also located. The gradient of this slope is slight, approximated at 1:100. The western boundary noticeably slopes from the last 20 m toward the river running in a southeasterly direction. Within approximately 100m from the river, the gradient becomes more appreciable, at approximately 1:15. The slope to the northeast of the site ranges between 0% and 2%; while to the west of the site the slope ranges from 11% to 24%.

The geotechnical report of the project reveals the project area lies at an average altitude of 2100 m above mean sea level. The rock occurrence in the area is dominated by the tertiary volcanic rock formations. Recent sediment deposits and soils overlay the rock formation. The soils comprise of fairly drained, shallow to moderately deep loam soils and friable clayey soils.

Figure 10: Site Slope Map



6.2.2: Ground and Surface Water Characteristics

The site generally drains westwards into the valley at the bottom of the site. Drainage of storm water into the site is minimal except from eastern sides that are higher than the site. Points of ground water i.e. spring were noted at some points towards the lowest parts of the site. This part is also swampy. A small stream runs close to the western boundary of the site.

The site water table is generally shallow lying in the range of 10m to 25m. Rain fed saturated soil layers were, however encountered at about 1.5 metres along the western boundary. This can be attributed to saturation of the soils due to poor/moderate drainage of the underlying soils compared to the top layers after infiltration and low hydraulic gradient due to the adjacent river. The groundwater springs largely indicates that the water table is possibly high due to the fact the site has a stream and a minor wetland on its western side.



Figure 11: Points of Ground Water (spring)

The results of water analysis indicate that levels of most of the parameters assessed are within the acceptable limit. However, Turbidity, pH and Faecal Coliforms are not within the limits. From the survey it was concluded that the water quality at the proposed project site is contaminated and needs filtration and disinfection before use. Conversely, another water quality survey will have to be carried out after land development.

6.2.3: Water Quality

The baseline water quality for the proposed project site were compared with the standards from NEMA Legal Notice No. 120, Third Schedule 'Guideline Standards for Discharge of effluent into the environment' as presented on table 5.

Table 5: Baseline Water Quality on the Industrial Park site

Water Parameters	Quality	Baseline Results	Water Quality	NEMA Allowable Limits	Maximum	Remarks
Turbidity		NTU	12.4		5.0	Above limit
Ph		Ph units	5.9		6.5-8.5	Below the limit
Total Solids	Dissolved	Mg/L	5.4		1200	Within the limit
Nitrates		Mg/L	1.1		10.0	Within the limit
Phosphates		Mg/L	1.45		5.0	Within the limit
Conductivity		μS/CM	87		1500	Within the limit
Faecal Coliform		Cfu/100ml	30		Nil	Above the limit
Total Hardness		Mg/L	2.96		100	Within the limit
Iron		Mg/L	0.109		0.3	Within the limit
Fluoride		Mg/L	0.07		1.5	Within the limit
Sulphates		Mg/L	1.3		250	Within the limit
Manganese		Mg/L	0.2		0.2	Within the limit

Chloride	Mg/L	2.61	250	Within the limit
Zinc	Mg/L	0.12	1.5	Within the limit

6.2.4: Climate and Weather Patterns

Eldoret experiences a warm and temperate climate characterized by an average temperature range of 16.6°C in the warmest months of February and March. In the coldest months, it averages at 9°C. The town has significant rainfall throughout the year with an average annual precipitation of 1103 mm. The month of February is within the comfort zone except for a few days, which are cooler. Similarly, July is completely outside the comfort zone and therefore there is need for heating the interior of buildings when the temperatures fall below 20°C and radiation is below 200w/m². This has implications on energy demand. Eldoret is close to the Equator; as such the solar path oscillates evenly to the North and South. It deviates to the North in June, it is overhead in March and September, and deviates to the South in December. The winds flow in the Northeast to southwest direction.

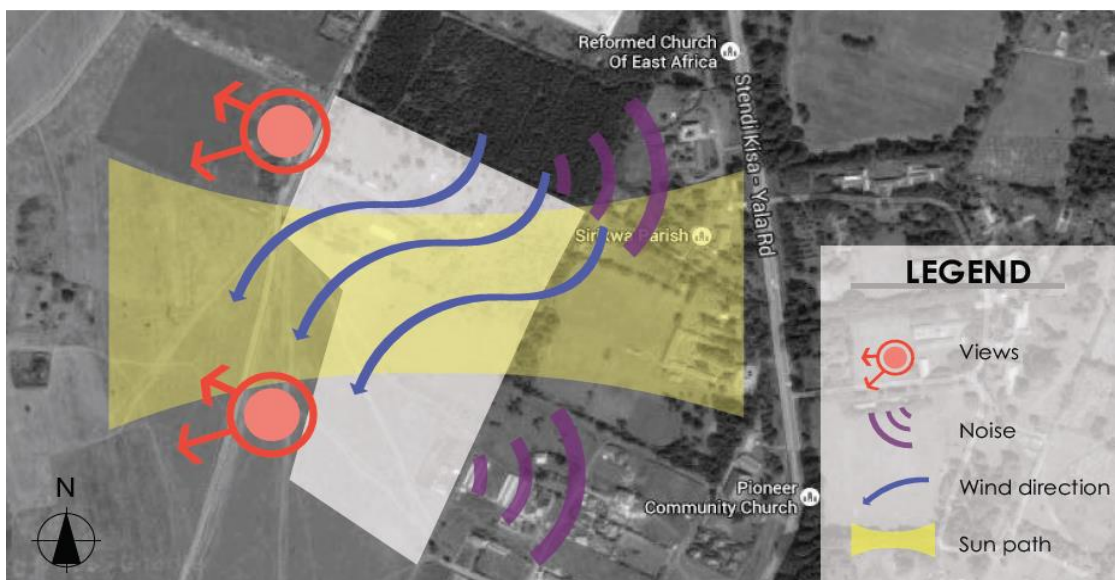


Figure 12: Views, Noise, Wind and Sun Path

6.2.5: Geology and Soils

The project area lies at an average altitude of 2100 metres above mean sea level. The regional history described below covers the geological area south of Cherangani Hills. The rock occurrence in the area is dominated by the tertiary volcanic rock formations (Kenya Geological Maps). Recent sediment deposits and soils overlay the rock formation. The soils comprise of fairly drained, shallow to moderately deep loam soils and friable clayey soils. Loamy silts, clay loamy silts and varying ranges of gravel silts overlay the stratum. This soil can be very good for agricultural use and will be opportune for landscaping at the site.

However, the alignment of the soil falls within S1 sub-grade class as classified by the Roads Design Manual Part III (Material and Pavement Design for New Roads). This soil class is structurally weak for pavement laying and will need capping or chemical treatment for pavement support. The foundation safe bearing capacity of the soil is 188kN/m² worked by Terzaghi and Peck formula assuming a 2.5m deep square 3m footing and a safety factor of

4. The results of soil analysis indicate levels of all parameters assessed are within the limit. As shown in the table below:

Table 6: Baseline Soil Quality on the Industrial Park Site

Parameters	Measurement Results	NEMA Standards (TLV)	Remarks
Ph	7.60	6.5-8.5	Within limit
Electrical Conductivity (EC) mS/cm	0.23	2	Within limit
Lead as (Pb) mg/Kg	<0.001	0.1	Within limit
Zinc as (Zn) mg/Kg	0.53	0.5	Within limit
Copper as (Cu) mg/Kg	0.16	1.0	Within limit
Potassium as (K) mg/Kg	4.75	2	Within limit
Sodium as (Na) mg/Kg	55.32	2	Within limit
Calcium as (Ca) mg/Kg	13.21	2	Within limit
Magnesium as (Mg) mg/Kg	1.18	2	Within limit
Manganese as (Mn) mg/Kg	0.61	10	Within limit

6.2.6 Radiation Levels

The soil samples collected at the proposed industrial park site were subjected to radiation measurement. The results indicated that the soil radiation levels are within limit as indicated in the table below. It also indicated that the project site does not have radioactive source. The main soil pollution is mainly from previous usage of the land and not due to any construction. From the survey, it was concluded that the soil health condition at the proposed project site is satisfactory. Nevertheless, another survey would have to be carried out after land development.

Table 7: Baseline Radiation Levels on the Industrial Park site

Location	Radioactivity Levels	NEMA STANDARDSTLV(mrem)	Remarks
Northern Block	0.5	300	Within the limit
Southern Block	0.6	300	Within the limit

6.2.7: Noise and Vibration Levels

The ambient noise levels at the proposed development site and its environ was between 27.0dB (A) and 51.1dB (A) which is within the NEMA Noise and Vibration limit set for commercial zones. The target noise level is set at 75dB (A) at construction sites. Currently, the noise emission is from wind, birds and animals at the site apart from traffic noise along the site access road. See the table below:

Table 8: Baseline Noise Levels on the Industrial Park site

Position on Site	Measured noise levels Leq dB(A)		NEMA Standards (TLV)	Remarks
	LeqMin	LeqMax		
North East	29.4	43.6	75	Within limit
North centre	35.0	50.7	75	Within limit
North West	27.0	49.9	75	Within limit

Middle West	29.6	55.5	75	Within limit
Centre	30.6	57.0	75	Within limit
South East	34.2	57.0	75	Within limit
South Middle	34.8	55.5	75	Within limit
South centre	33.8	65.5	75	Within limit
South west	51.9	63.3	75	Within limit

Predictions of noise during development phase shows that the target noise levels shall be met and will not impact negatively on the environment and neighbours. The noise that will be generated during operation phase is not expected to impact negatively on the environment beyond 200m from the centre of the development after mitigation. The effect of the development on the acoustic environment of the site and surrounding environment shall need to be investigated further during the construction and operation phases and appropriate recommendations made.

Vibration which is related to noise results from the transmission of low frequency energy through the medium of ground or buildings. It results in small movements of the transmitting medium, which can cause discomfort if the movements are large enough. The proposed ICDC land is current empty and no activities going on and such there is no source of vibration. It is proposed that during development and construction, the land vibration measurement be carried out periodically to assess the vibration exposure to the community.

6.2.8: Air Quality

From the measurement results, the air quality (dust concentration) emission and the noise levels at the site are low and within the accepted limit. Currently, the air emission at the proposed project sites is mainly dust and vegetation debris blown by wind.

The dust seen on tree leaves and on top of neighbouring buildings is not a risk to health as it is not inhalable. The results of the measurements indicate that there is no environmental air pollution or health risk to humans and the present air quality levels standards should be maintained as far as reasonably practically during construction phase.

The presence of Greenhouse gases such as Carbon monoxide (CO), Carbon Dioxide (CO²), Sulphur Dioxide, (SO₂) and Volatile Organic Compounds (VOC) were found to be within the acceptable limits based on NEMA Air quality regulations under first schedule, EMCA Act of 1999. Nonetheless, it was recommended that another survey should be done after construction phase to assess the operational emissions to the environment. The results of the air quality measurements are attached as part of volume two of the SEA study.

Its predicted that air pollutants from the proposed project will be from the proposed light heavy industries such as the tanning, agricultural mechanization, agro and veterinary chemicals/drugs, wood industry, fertilizer processing and packaging industrial prototypes. These industries have the potential to generate harmful compounds such as carbon dioxide, carbon monoxide, formaldehyde, benzene, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter etc. Suitable mitigation plan have been provided under chapter 9 and 10 of this report.

Table 9: Baseline Air Quality Findings on the Industrial Park site

Air Pollutants	Baseline Findings mg/m ³	Data (TLV)	NEMA Standards (TLV mg/m ³)	Difference (+ or -)	Remarks
Particulate Matter (Dust, black smoke, smog, aerosols);	0.14		360	359.86	Within limit
Carbon monoxide (CO)	Nil (o)		5	5	Within limit
Carbon Dioxide (CO ₂), Sulphur Dioxide, (SO ₂)	0.59-0.79		5	4.41- 4.21	Within limit
Volatile Organic Compounds (VOC)	Nil (o)		80	80	Within limit
			600	600	Within limit

6.2.9: Manmade Site Installations

There are utility lines traversing part of the site on the southern part that lead to waste of land due to the setbacks required. These utilities include the 11KV power line, the sewer line and the 30m wide road reserve that divides the site into two. The 11+9KV power line requires setbacks of up to 6metres on either side.

The project seeks to consider application for rerouting of the power line, an idea that Kenya Power received well and assured the team of its practicability upon formal application. Application for rerouting of the power line should be done together with application for connection to power. Sewer rerouting, according to the concerned agency, ELDOWAS, is only possible for a very small section of the line within the site. The rerouting of sewer is however technically complicated due to issues of topography of the site. The planning team has to find innovative ways of integrating this into the land use plan.

Figure 13: Part of Sewer Line Traversing the Site



6.2.10: Biodiversity

The site is generally clear of any other forms of vegetation, except for grass, which covers the ground throughout the site. About four different grass species, three herbaceous plant species and two shrub species were observed on the site. The predominant grass type is Kikuyu grass. The site is also a habitat for various invertebrates such as insects. There is no wildlife. The biodiversity of the site requires significant enhancement, especially tree and shrub planting. It is anticipated that this can attract mainly birds to the area and increase the fauna diversity.

Figure 14: Site Vegetation Cover



6.3: SOCIO-ECONOMIC ENVIRONMENT

6.3.1: Population and Demography

According to the 2009 Population and Housing Census, the total population of Uasin Gishu County stood at 894,179. At an inter-censal population growth rate of 3.8%, the total population is projected to grow to 1,211,853 by 2017. The population growth rate is higher than the national growth rate at 2.9%. The population density is 267 persons per sq. Km. which is expected to increase to 362 persons per sq. km. by 2017. This will have implications on the average size of land holding.

In 2012, the population age group between 0 to 14 years was 41.4% of the total; while the economically active age group of between 15 and 64 years accounted for 55.7% of the total. This implies that the County has a high dependency ratio and a high potential for labour force. The age group under one year is projected to grow from 29,175 in 2009 to 39,539 by 2017, while that aged between 2 and 5 years is expected to grow from 162,559 in 2009 to 220,311 by 2017.

Development of the Industrial Park is likely to contribute to an even high population growth rate in three ways. The first one will involve people coming to seek for jobs in the industries, the second is entrepreneurs coming to set up their own businesses especially in the commercial and logistics clusters of the Industrial Park and the third will be in all the agricultural, livestock, fisheries and forestry sub-sectors for increased raw material production to supply the agro-processing industries. This will increase demand for social services and utilities.

6.3.2: Health Services

The County has 170 health facilities ranging from level 2 to 6. Most of the facilities are concentrated within Eldoret Municipality but whose catchment extends upto Uganda, Rwanda and South Sudan. At the apex of the health system is the Moi Teaching and Referral hospital. Whereas the number of existing facilities is quite appreciable they are not sufficient to service the wide catchment area including the health needs of the County itself.

6.3.3: Access to Family Planning Services

The population growth rate in the County is 3.8% which is high compared to the national population growth rate of 2.8%. Family Planning services are available in Uasin Gishu County in government and private health facilities. Family Planning prevents up to one third of maternal deaths by helping women avoid „risky births“. However, contraceptive acceptance is low standing at only 34% compared to national average of 46%. The County will need to emerge with strategies to scale up the acceptance rate.

6.3.4: Sexually Transmitted Diseases, HIV and AIDS

A major reproductive health concern that has continued to affect a large population of Kenyans in their reproductive ages is Sexually Transmitted Diseases (STD), HIV and AIDS. Uasin Gishu County has achieved a steady reduction in HIV and AIDS prevalence from 14 % and 8% in urban and rural areas in 2002 to 7% and 6.5% in urban and rural areas in 2007 respectively. This rate further reduced to 4.5% in 2012 and is less than the national prevalence level of 5.6%. Despite this positive development, the prevalence rate of 4.5% is still high and the County must still aim at achieving the target of 3.5% by 2017.

6.3.5: Agricultural Activities

Agriculture is the main economic activity in Uasin Gishu County providing livelihood and food for over 80% of the rural population and employing over 57% of the labour force (16-64 years). The average farm size in Uasin Gishu is 2-10 acres with a wide range of crop and livestock enterprises. The crop enterprises include food crops, cash/industrial crops and horticultural crops whereas the livestock enterprises include dairy, poultry, sheep, goats, pigs, bee keeping and fish farming.

The three main livelihoods in the County are mixed farming (food crops and livestock), mixed farming (commercial crops and livestock –dairy) and formal/casual employment. Agriculture sector comprises of livestock production, veterinary, agriculture and fisheries departments. Characteristics of agricultural sector varies widely from predominantly small scale with low external inputs to highly mechanized large scale farming with very high levels of external inputs. Uasin Gishu has a rich agricultural resource base with 80% of the land tenure being privately owned. Private ownership of land has encouraged investment in

permanent and long term improvements of development on farms. Small scale farming subsector (0-30 acres) accounts for 75% of the total agricultural produce.

However, the County has not exploited its potential. Production of main food crops and livestock has generally been low. Farmers depend on rain-fed agriculture and that production costs for most crops are high due to high input costs especially fertilizers, poor and long marketing chains consisting of many players for the different commodities making them inefficient and unresponsive to the process needs. Low levels of mechanization and high transport costs due to increase in global oil prices. Private sector initiatives have not been fully explored. This untapped potential should be harnessed to improve local market infrastructural developments in partnership with local authorities.

6.3.6: Employment and Other Sources of Income

The County has potential labour force of 550,000 (or 56% of the entire population). This implies that 44% of the population is dependant. Out of the total labour force, also 44% are engaged in self-employment. It can be inferred from the foregoing that those seeking employment prefer wage employment pointing to the need to create more job opportunities in the County.

6.3.7: Trade and Industrialization

The County Government needs to align its activities with the Vision 2030 blue print and identify key sectors that the County can participate in and contribute towards the realization of the Vision. Uasin Gishu County is strategically located as a gateway for both local and Regional markets. The infrastructure in the County is fairly developed i.e. road, rail and air networks, it is also home to many financial institutions, Education institutions and Medical institutions.

Industrial development in Uasin Gishu County is diverse. These include: agro processing, construction, plastic manufacturing and textile. The major industries in Uasin Gishu County include: Rivatex, Kenknit, Rift valley bottlers, Eldoret Grains, Laminated Tubes Industries, Unga Group Millers among other developing industries. However, these industries have not fully exploited the potential that exists in terms of raw materials. Despite Uasin Gishu County being an agro-based economy, industries related to this sector have not yet been fully exploited. They include: animal feed factory, fertilizer industry, leather industry meat and milk processing.

The Uasin Gishu County boasts many institutions of higher learning with robust Research and Development (R&D) programmes. These programmes are expected to emerge with novel products that could be up-taken by industry or potential investors. A recent development in the institutions of higher learning is the establishment of incubators through which budding innovators are given opportunity to develop their products to full maturity. What is missing is the umbilical cord between industry and the learning institutions through which the former could articulate their needs and the latter could transfer the researched technology. Under this Plan stakeholders from industry and institutions from higher learning will be afforded opportunity to nurture these vital linkages. Business Process Outsourcing (BPO) is currently a major source of employment for the youths. However, this has not been exploited in Uasin Gishu County. Business Process Outsourcing (BPO) is currently a major source of employment for the youths. However, this has not been exploited in Uasin Gishu.

6.3.8: Housing

According to the National Housing Policy of 2004, of the required 150,000 additional housing units per year for urban households in the country, only 30,000-50,000 (20-30%) are supplied leaving a deficit of 80-70% unmet. This contributes to emergence of informal settlements. Investment in housing supply is therefore a desirable and priority investment for the country as whole and urban centres across the country.

There is a general shortage of decent housing in almost all the urban and trading centers in Uasin Gishu County (County Integrated development plan (2013-2017),). Regardless of the foregoing, substantial open spaces and land that could be utilized to provide housing to residents still exist. The increased demand for housing is brought about by an upsurge of immigrants from neighboring Counties, as well as Uganda, and South Sudan. This factor has brought pressure on the available land and has occasioned a spiral in land prices. The high cost of land coupled with high cost of building materials has also contributed to the slow development of housing in Eldoret Municipality. Moreover, there are no immediate plans to construct low cost decent housing. This is one obvious opportunity for County Government to forge a public private sector participation project in housing development.

6.4: TRANSPORT AND INFRASTRUCTURE

Uasin Gishu has an extensive road network comprising of over 300 Kms of tarmac roads, 549 Kms of murrum and 377 Kms of earth roads. It also boasts 179 Kms of railway line with 8 railway stations. In addition, there is an inland container depot. The Moi International Airport and two airstrips are also located in Uasin Gishu easily making it the region's service hub. Implementation of the Industrial Park will increase demand on the existing infrastructure and improve on utilization of the underutilized infrastructure such as the railway line and airport. This will play a significant role in the county's economic growth and poverty reduction.

The main water resources in the County include dams, rivers, boreholes, shallow wells and springs. The County is drained by 4 major rivers, namely; Moiben with its 3 tributaries; Sosiani also with its 3 tributaries; Sergoit with 2 tributaries; Kipkarren with 9 tributaries and River Nzoia. There are over 120 dams which were constructed by the colonial Government for recreation purposes but are now water sources for most households. There are also about 250 boreholes in the County of which 170 are registered. Most homes have shallow wells.

The disposal of solid waste is not a major challenge for rural households since a significant number of households (72.1%) have pit latrines. However, there is no room for complacency as the desired proportion of households using latrines under this CIDP is 85-100%. Poor waste disposal in urban areas and towns in the County is however, a major challenge and a key contributor to environmental degradation and pollution. The lack of a proper and adequate sewerage system in Eldoret and other urban centres has led to the emergence of open sewers. The Urban areas also face serious problems in managing solid waste as piles of uncollected garbage litter most estates. The uncollected garbage is home to vectors which in turn transmit diseases.

CHAPTER 7: STAKEHOLDERS AND PUBLIC ENGAGEMENT

7.1: OVERVIEW

Public participation and stakeholder engagement is considered a distinguished feature of Strategic Environmental Assessment (SEA). Various SEA literature has traditionally identified several benefits attached to it, from more open and transparent decision-making to greater acceptance of plans/programmes output by the affected population.

The proposed project SEA study public and stakeholder's consultations in this SEA was carried out in accordance to the legal framework spelt out in the Constitution of Kenya 2010 and EMCA 1999. Specifically, public and stakeholder engagement under this SEA study was carried out among others to:

- a) Provide a more comprehensive understanding of the baseline environment and relevant key individual and community issues and values to be integrated into the preparation of the industrial park master plan;
- b) Enhance transparency in decision-making, by providing information which allows early identification and mitigation of impacts;
- c) Obtain information about potential environmental effects at an early stage of the SEA process; and
- d) Facilitate understanding and appreciating of the proposed industrial park thus avoiding unnecessary controversy and delays during implementation.

This chapter describes the objectives, methods used and summary of results of the public and stakeholders' consultation activities undertaken during the SEA study for the proposed industrial park development.

7.2: STAKEHOLDER IDENTIFICATION

Key stakeholders consulted during the SEA study were identified in accordance with the areas/sectors that are affected directly or indirectly by the proposed industrial park development. Stakeholder analysis was done with a view to understand stakeholders' positions, influence on other groups, and their interest in this particular master plan; provide an idea of the type of impacts of the master plan, highlight the divergent views on the proposed master plan, and potential power struggles among groups/individuals; and help identify potential strategies for negotiating with stakeholders with divergent opinions.

The criteria used to identify various stakeholders was based on the legal mandates of various institutions; assessment of the different interests of the stakeholders; stakeholder power rights and responsibilities; potential role in the industrial park development and human and technical resources that can contribute to the success of the industrial park Master Plan implementation. Therefore, the stakeholders identified and consulted included the national Government Sectoral Development and Law Enforcement Agencies such as (ICDC, NEMA, Kenya National Chamber of Commerce, ELDOWAS, KURA, WRMA etc.), the Uasin Gishu County government, private companies and groups of affected individuals. Other stakeholders that were consulted include: Educational Institutions such as Moi University Eldoret, Eldoret Polytechnic, Kenya Industrial Estates (KIE), women and youth Associations – see table 10.

Table 10: Stakeholder Categories and Engagement Approaches

CATEGORY	STAKEHOLDER GROUP	ENGAGEMENT APPROACH
Project Proponent	<ul style="list-style-type: none"> ▪ Industrial and Commercial Development Corporation (ICDC) ▪ Ministry of Industrialization and Enterprise Development 	Round Table Discussions
Government Sectoral Development and Law Enforcement Agencies	<ul style="list-style-type: none"> ▪ National Environment Management Authority (NEMA) ▪ Eldoret Water and Sanitation Company Limited (ELDOWAS) ▪ Kenya Power ▪ Water Resources Management Authority (WRMA) ▪ Physical Planning Department ▪ Ministry of Lands, Housing and Urban Development ▪ Kenya Urban Roads Authority ▪ Ministry of Agriculture, Livestock and Fisheries Development. ▪ Kenya Forest Service 	Key Informant Interviews
Project Affected Persons	<ul style="list-style-type: none"> ▪ Resident associations ▪ General public 	Public Meetings Stakeholder Meetings
Business Community	<ul style="list-style-type: none"> ▪ Kenya Industrial Estates ▪ Kenya National Chamber of Commerce and Industry ▪ Kenya Cotton Growers Association ▪ Rift Valley Textiles Limited (Rivatex) ▪ RAIPLY 	Key Informant Interviews Round Table Meetings
County Government	<ul style="list-style-type: none"> ▪ County Executive Committee, Appointed and Elected Leaders 	Round Table Discussions Key Informant Interviews

7.3: SEA STUDY STAKEHOLDER CONSULTATIONS

Stakeholders' Activities in SEA plays three fundamental, complementary and non-exclusive functions relative to the decision-making process. In a strategic approach, some of these activities include; integration of environmental and sustainability objectives and issues into planning and programming procedures; assessment of strategic options with respect to opportunities and risks and validation of SEA performance.

The proposed project made a number of Stakeholder Consultations/forums to deeply interrogate environmental and socio-economic issues in the proposed industrial master plan. Stakeholders and the public consulted in this SEA participated in a number of activities which included assessment of strategic options relative to the opportunities and risks to the environment and to the sustainability of decisions of the proposed industrial park master plan. They were also involved in validation to authenticate if the issues raised during various forums were incorporated in to the SEA as well as getting to know how SEA will contribute to greater efficiency in strategic processes and for better quality in the expected outcomes of the proposed master plan. The various SEA forums for the proposed Eldoret ICDC industrial park master plan is presented in the table below:

Table 11: SEA Forums for the Proposed Eldoret ICDC Industrial Park Master Plan

Forum	Date	Venue	Stakeholders	No. Of Participants
1. Inception meeting	15/6/2015 4/12/2015	Uasin Gishu County, Board room	Senior County Officials	10
2. Industrial Players	16/6/2016	Sirikwa Hotel, Eldoret	Representatives of KAM, KIE, KNCCI	20
3. Key Community Opinion Leaders	1/9/2015	Starbucks Hotel, Eldoret	County Administration, CBOs, Youth and Women representatives, NGOs etc. at sub county level.	75
4. Key Informant Interviews	2015-2016	-	ELDOWAS, NEMA, County Line Ministries Chief Officers, County Physical Planner, County Director Roads, Kenya Power, KNCCI, WRMA, Kenya Industrial Estates (KIE).	15
5. Public Baraza	3/9/2015	Project site (bock 15/1757)	The general Public-MCA, chief, county officers, CBOs, Local universities, Industrialists, NEMA, NGOs etc.	Over 1500
6. Client (ICDC)	2015 to date	Uchumi House, Nairobi	ICDC Management	10
7. Prevalidation	26/5/2016	Sirikwa Hotel, Eldoret	Representatives from National & county government, county administration industrialists, NEMA, Representatives of KAM, KIE, KNCCI, CBOs, Youth and Women representatives, NGOs etc.	75
8. SEA Validation workshop	2/2/2017	Sirikwa Hotel, Eldoret	Representatives from National & county government, county administration industrialists, NEMA, Representatives of KAM, KIE, KNCCI, CBOs, Youth and Women representatives, NGOs etc.	72

7.4: MATTERS ARISING FROM STAKEHOLDER CONSULTATIONS

The issues identified through public and key stakeholders' consultations broadly touched on environmental and socio-economic issues in the proposed industrial master plan. These were considered in order to provide a high level of protection of the environment and to contribute to the integration of environmental considerations in the preparation of the industrial park master plan.

7.4.1: Public Forum

On 3rd September 2015, the SEA team had a major public forum meeting for the design and documentation of the proposed industrial park at the ICDC project site block 15/1757, behind Rivatex. Over 1,500 members of the public and stakeholders attended this forum. Other groups who attended the forum included the County Government administration officials; stakeholders from the industrial sector; NGOs and national government Institutions representatives; business associations; youth and women groups; religious leaders; neighboring residents from Langas, Pioneer, and Kipkaren; and the community association representatives among others.

Environmental Concerns: The public noted that it would be important for ICDC to ensure that the proposed industrial development does not adversely affect River Cherunya. They argued that other developments within the area have contributed to dumping of toxic waste into the river system. Thus, residents who depend on the river continue to suffer from respiratory diseases but also from acid burns, rashes, aches, dizziness, and nausea.

As a mitigation measure, the residents emphasized the need for environmental protection such as planting indigenous tree species in the park and on the park boundary for windbreak and cleaning of air; effective installation and management of proper solid waste and liquid waste water treatment and disposal whereby every industry should have its own treatment plant for inspection before discharging into the main sewer line. Moreover, there should be provision of sufficient water supply to ensure good sanitary conditions in the park, controlling of flooding through ensuring proper storm water management in the park and if possible harvest all the water. Other suggestions that were made also with regards to protection of the environment include adoption of solid and e-waste management strategies such as re-use and recycling of waste.

The residents also preferred more light industries that are less polluting as opposed to heavy industries. Among additional industries proposed include, Jua kali for metal fabrications, Jua kali show rooms, shoe making, hand bags, and leather foot balls. Industrial typologies rejected by the public included tannery, abattoirs, fertilizer production and agro-veterinary chemicals.

Socio-Economic Issues: The public was impressed by this project due to the fact that it will create more job opportunities to locals, youth and women. However, from a socio-economic angle the public expressed their anxiety that as a consequence there would be increased population influx. As a result, the public requested for increased investment in social amenities such as schools, health facilities, children play ground (park), football field, entertainment, social halls etc. To stir the local economy, community cooperation and job creation during construction of the park, the project proponent was urged to use local materials for construction, ensure community participation as well as create projects that will generate income for the surrounding communities.

As a cooperate social responsibility gesture, the public urged ICDC to extend the sewer about 2-3 km into Langas Estate to capture wastewater emitted into Cherunya Stream, include a police post to improve on security, consider improving neighbourhood infrastructure such as roads, water, and electricity, plan for a recreation site and a youth sports centre to promote young talents as well as plan for proper housing in the neighborhood to avoid creation of slums. Lastly, the team was also urged to prevent illegal

activities during and after construction. These include activities such as informal businesses in the park or on the road reserve.

Figure 15: Public Forum Meeting at ICDC Project Site Block 15/1757, Eldoret.



7.4.2 Key Stakeholder Workshop

On 1st September 2015, the SEA team had a successful stakeholders' workshop at Starbucks hotel in Eldoret. Over 60 (75 in the Table??) stakeholders attended the 1 day workshop. The participants were from various groups including the County Government administration officials, stakeholders from the industrial sector mainly industrialists, NGOs and national government Institution representatives, business association, youth and women groups, Langas, Pioneer, Kipkaren resident association representatives, religious leaders, representatives from universities and other educational institutions in Eldoret among others.

During the stakeholder workshop a number of environmental and socio-economic concerns were raised with regards to the proposed industrial park development. The environmental issues raised included the protection of Cherunya stream from the industrial effluent pollution. This concern was tied to the tendencies various industries within the County have of discharging their waste effluent into water bodies. The stakeholders suggested to the team that, the park should prevent land and water pollution through efficient use of water resources and having clear strategies on how they will handle their waste, preferably the offsite treatment methods.

Another concern raised was on various industrial typologies proposed with a potential to cause heavy air pollution. This was linked to the fact that air pollution from industries has negative impacts to the environment including spread of respiratory diseases, formation of

acid rain among others. To mitigate these negative effects, the stakeholders highly recommended planting of many trees of various species for carbon sequestration. On socio, economic matters, the stakeholders acknowledged that the proposed park would be a major source of employment. They suggested that the proposed industrial park should take into account among others; consideration of the local needs, priorities and concerns such as job opportunities, improvement of security, inclusive employment of various marginalized groups such as women, youth and persons with disability.

Figure 16: Stakeholder Consultation Workshop at Starbucks Hotel, Eldoret.



7.4.3 Industrialists: Kenya Industrial Estates

The key industrial players in Uasin Gishu County are mainly from the textile, and agro-based or food processing industries. From the discussions with the industrial players, it emerged that the main challenges facing industrial investments in the county were political interference from those in power who have vested interests in industrial development, poor management of industries (KIE experience), inefficiency in supply of raw materials and lack of empowerment and capacity building for the local investors.

The industrialists emphasized the need for a thorough stakeholder consultation mainly from the County government, area local authority where the proposed industrial park will be located including the MCA, sub county administrator, ward representative and the local elders such as the chiefs. Lastly the key industrial players in Uasin Gishu County called upon ICDC to consider the small-scale incubator groups (Jua kali) of industrialist as well as give priority to value addition mainly for the textile and agro-processing industries in the County.

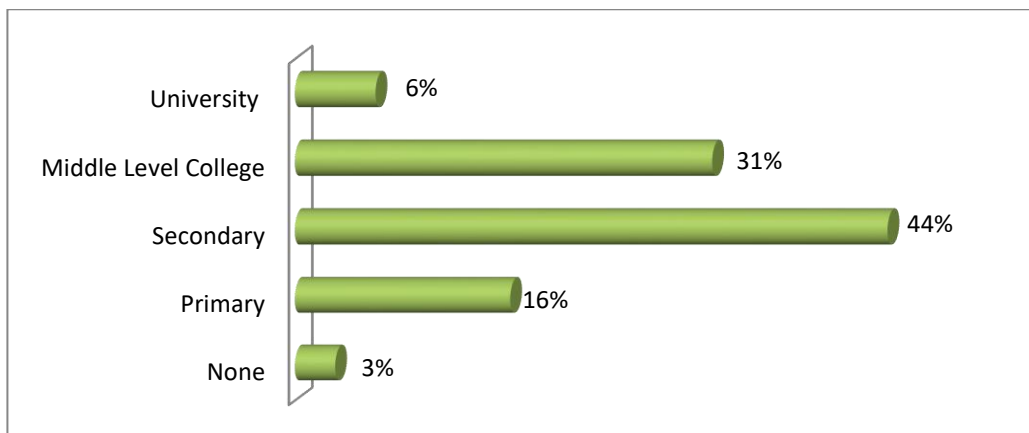


Figure 17: SEA team meeting with Industrialists in Eldoret

7.4.4 Household Survey

A total of 140 households from Langas (67), Pioneer (37) and Kipkaren (36) Estates were interviewed. Household survey mainly focused on getting primary data from neighboring households within the proposed industrial park with regards to social, economic and environmental effects of the development. From the survey, 58% of the respondents were male while 42% were of female. As presented in chart 1 below, more than half of the residents have attained secondary education at 44% of the population, 16% have attained primary education, 37% have attained tertiary education (middle level college/university), while only 3% of the population interviewed had never attended school - see chart 1.

Chart 1: Education Level of the Respondents



Source: Field Survey, 2015

Socio-Economic Impact of Proposed Industrial Park: Majority of the respondents (89%) indicated that the industrial park project would improve their living conditions. Some of the envisioned benefits from the industrial park development include business opportunities for the local traders such as supply of raw materials and food for the workers, market for finished industrial products, real estate development especially housing to cater for the park employees. They also noted that the park would create employment opportunities for both skilled and semi-skilled labourers. Furthermore, the Langas estate residents were optimistic that the park will trigger expansion and addition of basic infrastructure such as road network, storm water drainage and sewerage reticulation system to the estate hence making it more habitable.

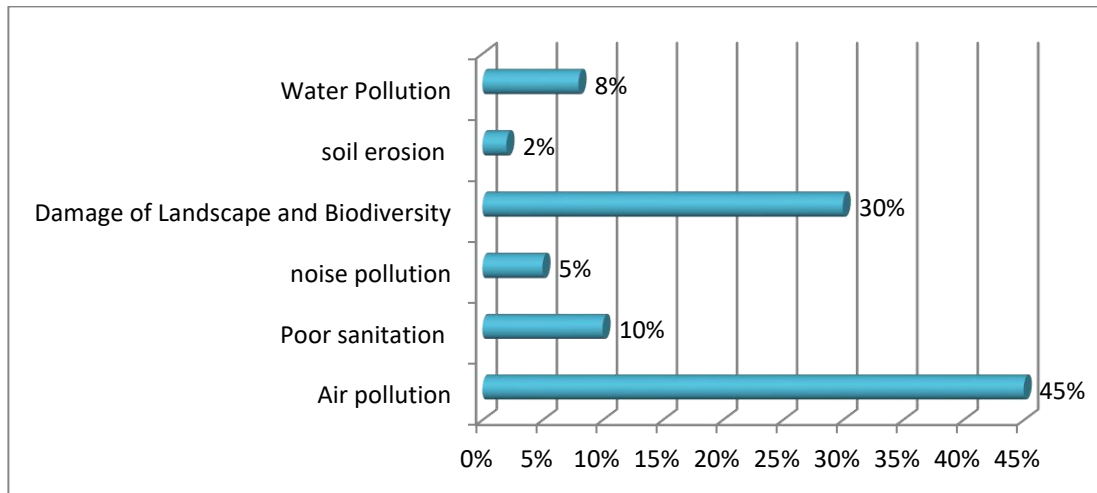
Eleven percent (11%) of the respondents indicated that the industrial park project would not improve their living conditions. They argued that they were not sure if they would secure employment during and after construction of the park. This was attributed mainly to vices such as corruption during employment, contractors employing non-residents, political interference, vested interests and not giving priority to local labourers during such projects.

Further analysis indicated that over 93% of the respondents were of the opinion that the proposed EIIP will address the major economic challenges of the area of high levels of unemployment and poverty. Seven percent (7%) felt that their economic challenges will not go away. To minimize the identified challenges and ensure more economic benefits to the locals, out of the above 93% concerned locals, 55% of them recommended that locals be given priority in employment opportunities, 27% were of the view that local businesses be promoted by buying raw materials from the locals while 18% recommend equity and equality in allocation of employment opportunities.

With the introduction of the proposed industrial park, 90% of the respondents predict an increase in population while 10% are convinced there will be no population influx during and after the construction and operation phase of the industrial park. Prediction of the increase in population in the area was mainly attributed to the job opportunities the park will generate.

However, residents fear that as much as the industrial park will bring positive impacts to their lives and environment, an increase in population would lead to human/vehicular congestion, increase in rent due to high demand for housing, proliferation of informal settlements at the periphery or within the park, and insecurity. Moreover, the living standards would shoot up as a result of better remuneration by park employees.

Environmental Impacts of the proposed Industrial Park: Respondents mentioned land, air and water pollution as the major potential environmental impacts of the proposed development. As indicated in Chart 2 below, approximately 45% of the respondents mentioned air pollution as the major environmental challenge while 30% cited damage of landscape and biodiversity, 10% felt poor sanitation (liquid/solid waste management) would be a major environmental issue, 8% mentioned water pollution, 5% noise pollution and 2% soil erosion.

Chart 2: Respondents Major Environmental Challenges

Source: Field Survey, 2015

Mitigation of Negative Effects: In view of the potential impacts of the proposed industrial park, the respondents argued for mitigation of negative effects of the park activities. They noted that there should be sufficient safeguards to ensure environmental quality. Over 77% of the respondents felt that a well-planned industrial park integrated with greenery would improve air quality, health and well-being of the environment by reducing noise, recharging ground water hence preventing drying up of River Cherunya, preventing soil erosion, enabling flood attenuation through sustainable urban drainage systems, cooling and pollution-absorption functions of trees among others.

7.4.5 SEA Pre-validation Workshop

On Thursday, 26th May 2016 the SEA team organized a 1-day Eldoret ICDC Industrial Park Strategic Environmental Assessment (SEA) Study pre-validation workshop for the Eldoret ICDC Industrial Park Master Plan on Block 15/1757, Eldoret Municipality at Sirikwa Hotel, Eldoret. This forum was aimed at formally engaging various stakeholders from Uasin Gishu County to ascertain whether the environmental and socio-economic issues raised during the first Stakeholder workshop held on 1st September 2015, in relation to the Eldoret ICDC Industrial Park had been taken into consideration before final submission of the SEA Masterplan report to NEMA for approval.

Over 75 stakeholders attended the Strategic Environmental Assessment (SEA) study pre-validation workshop including officials from the Uasin Gishu county government and line Ministries (Trade, Industrialization, cooperatives, tourism & Wildlife Water, Energy, Environment & Natural Resources, Finance and Economic Planning), Local administration from Soy, Turbo, Moiben, Ainabkoi, Kapseret, Kesses, Langas, Kapsaret, Wareng Estate, Kipkaren, the county commissioner, official representatives from the ELDOWAS, NEMA, KAM, WRMA, KIRDI, KIE, KNCCI, Kenya Power, Youth and women groups resident associations among others.



Figure 18: Participants of the 1-day SEA study pre-validation workshop for the Eldoret ICDC Industrial Park Master Plan at Sirikwa Hotel, Eldoret.

The stakeholders main concerns touched on whether the Eldoret ICDC Industrial Park Master Plan had provided for; various target groups such as the youth centres/facilities and the Jua kali sector, waste management, water & power supply strategies, security, fire and emergency responses, greenery and open spaces, river Cherunya conservation plan, corporate social responsibility, research and incubation to accommodate institutions specialized in industrial research and development and training young industrial ventures targeting entities such as the Kenya Industrial Research Development Institute (KIRDI), Moi University, Eldoret Polytechnic KAM among others.

From the plenary discussion, it was indicated that all the above issues had been taken into consideration and the park's environmental and socio-economic negative effects had been provided for with effective mitigative strategies under the environmental impacts and mitigation measures, environmental initiatives and strategies, strategic environmental and social management plan (chapter 9,10 and 11 respectively) of the Draft SEA report.

7.4.6 Comments from the SEA Public Advert

In compliance with provisions of section 57A of the EMCA, 1999, Regulations 42 and 43 of the Environmental (Impact Assessment and Audit) Regulation notice No. 101 of 2003 and the National Guidelines for SEA 2013, ICDC as the Project Proponent published both in the Kenya gazette and the 2 local dailies (Daily nation and Standard Newspapers) public notice advertisements inviting members of the public to submit their comments on the draft SEA report for the proposed Eldoret ICDC Industrial Park. The adverts were published on the Kenya gazette notice No.8231 and Daily nation and Standard Newspapers dated: Tuesday, September 20th and 27th, 2016 respectively.

Only one comment was received from the Ministry of Devolution and Planning, State Department of Planning and Statistics by the end of the public disclosure period. The Ministry commended the SEA for the proposed project for making key references to the policy and legal frameworks, conducting a detailed stakeholder and public engagements as well as commendable effects the project will have on key sectors such as agriculture, trade, transport among others. In addition, the Ministry noted the proposed project SEA was driven by the concept of sustainability and therefore the integration of sustainability objectives to the state and effect of the project was highly commendable.

On the other hand, the Ministry felt the final SEA report for the proposed project should address a number of gaps identified as follows:

- i. The SEA Monitoring and evaluation plan for the EIIP should make use of the National Integrated Monitoring and Evaluation System (NIMES) reporting framework. This has been articulated in Chapter 11 of this report on implementation, monitoring and evaluation management plans.
- ii. The air quality limits need to be quantified against the NEMA standards. This gap has been clarified under chapter 6 of this report on baseline environmental conditions.
- iii. The need to capture the aggregate effect of the environment as short, medium and long term, permanent and temporal, positive and negative as opposed to generalizing the effects. Chapter 9 of this report highlights the strategic environmental impacts, significance, management strategies and mitigation where under Table 9 (criteria for environmental risk analysis) the various environmental effects of the proposed project parameter for analysis such as coverage (extent or geographical scale), magnitude, duration, frequency, reversibility and probability have been quantified.

7.4.7 SEA Validation Workshop

In compliance with the provisions of article 10(2f), 69(1d) and 174 (c) on Public Participation in the Constitution of Kenya (2010), section 57A of the EMCA, 1999, Regulations 42 and 43 of the Environmental (Impact Assessment and Audit) Regulation notice No. 101 of 2003 and the National Guidelines for SEA 2011, on Thursday, 2nd February 2017 the UNES consultancy and ICDC in collaboration with NEMA organized a 1-day Eldoret ICDC Industrial Park SEA Study validation workshop for the Eldoret ICDC Industrial Park Master Plan on Block 15/1757, Eldoret Municipality.

The workshop was graced by 5 representatives from UNES consultancy team, 1 representative from ICDC, 2 representatives from NEMA and over 72 stakeholders including the county commissioner, officials from the Uasin Gishu county government and line Ministries (Trade, Industrialization, cooperatives, tourism & Wildlife Water, Energy, Environment & Natural Resources, Finance and Economic Planning), Local administration from Soy, Turbo, Moiben, Langas, Kapsaret, Wareng Estate, Kipkaren, the county commissioner, official representatives from the ELDOWAS, NEMA, KAM, WRMA, KIRDI, KIE, KNCCI, Kenya Power, Youth and women groups resident associations among others.

The main purpose and rationale for the workshop was to finally engage all the stakeholders in reviewing and validating the corrected draft Eldoret ICDC Industrial Park Master Plan SEA report to ascertain whether all the environmental and socio-economic issues raised during the previous SEA engagements had been addressed. This followed a successful submission of the draft SEA Report to NEMA after a highly participatory SEA process.

Table 12: Validation workshop concerns raised per stakeholder category

Stakeholder Category	Concern(s)	Response from Consultancy Team
Local Community Opinion Leaders, Jua Kali Sector, Women Association, community health Volunteer	Job Creation and Employment	<ul style="list-style-type: none"> ▪ The proposed project is expected to create over 40,000 indirect employments and 15,000 direct employment able to sustain about 50,000 households. ▪ For the employed population, there will be increased wages that will eventually increase money circulation within the area leading to the young men and women engaging in social vices such as increase in immorality, drug abuse, prostitution, hence spread of HIV and sexually transmitted diseases, breaking of families among other negative effects. ▪ The proposed development will not have the potential to absorb all the job seekers. Apart from this leading to the unemployed group engaging in other survival means that will trigger the above mentioned social vices, there will also be increased insecurity and crime such as theft, burglary among others. ▪ The project proposes 1 police post within ½ km radius that will serve the proposed industrial park and its environs against insecurity risk. In addition, the management of the park will have to integrate HIV/AIDS prevention and treatment within the proposed health centre in the park. The park's management will also conduct periodic seminars to educate the workers on these social ills.
	Population Influx effects	<ul style="list-style-type: none"> ▪ Some of the negative impacts of population influx include; pressure on existing infrastructure and social amenities such as schools, hospitals and recreational grounds, increase in social ills, and proliferation of informal settlements. ▪ Usually movement of populations due to a development is not easy to control and may depend on broader government strategies such as de-concentration of major developments. It is therefore not possible for the proposed development to identify measures that would be used to stop population influx to Eldoret and also to the site. ▪ Nonetheless, the proposed project has put in place measures to ensure that key infrastructure and amenities that would be required will either be provided in the park or in collaboration with the existing agencies such as the county government.
	Housing	<ul style="list-style-type: none"> ▪ To alleviate the challenges associated with demand and supply of housing as a result of the proposed development, it is recommended that the Uasin Gishu County government should enter into housing development public-private partnerships (PPPs) to ensure that there are sufficient houses for the industrial park workers and can identify other incentives to encourage individual/private developers to come up with decent, affordable low cost housing. ▪ Provision of housing for low-income workers will eliminate the risk of emergence or expansion of informal human settlements. The same category of workers will not be pushed out of the locality because of high rents however, increase in land prices and prices of houses may not change with the mitigation measures. ▪ As a long-term strategy, the government should also look at ways of unlocking land supply since land is usually the largest real-estate expense, securing it at appropriate locations can be the most effective way to reduce costs; reducing housing construction costs; improving operations and maintenance and lowering financing costs for buyers and developers to guarantee decent and affordable housing for all.
Jua Kali Sector	Social Amenities	<ul style="list-style-type: none"> ▪ With an estimated 250,000-population influx as a result of the proposed project, both population size and age structure will influence demand and supply of social amenities. ▪ The Industrial Park will host 1 health centre in the proposed ICDC complex to cater for health needs of the industrial workers and the neighbourhood population. In addition, the master plan has provided a belt of green public open space designed to enhance recreational needs of local dwellers and industrial park workers, to promote physical and mental health benefits through provision of paved pedestrian walkways, jogging trails and bicycle trails. ▪ These provisions will improve air quality and promote social cohesion and interaction. Lastly, as a corporate social responsibility, ICDC will invest in school's improvement initiatives such as renovation and expansion of classrooms that will benefit neighbouring educational institutions and the society at large.
ELDOWAS, Jua kali Sector	Water Resources	<ul style="list-style-type: none"> ▪ Provision of portable water in Eldoret and its environs is under the jurisdiction of Eldoret Water and Sanitation Company (ELDOWAS) and Lake Victoria North Water Service Board.

		<ul style="list-style-type: none"> ▪ The method selected for wastewater treatment for the park at the Central Effluent Treatment Plant is the use of simple, low cost, low maintenance and efficient Waste Stabilization Ponds (WSP). Grey water shall undergo recycling at the plot level. The neutralized wastewater shall then be channelled to the Central Effluent treatment plant for further treatment before discharge into the ELDOWAS main sewer line. ▪ The industrial wastewater and black water shall then be treated to conform to the EMCA (Water Quality) Regulations 2006 (Schedule 13 on Standards for Effluent Discharge into Public Sewers). ▪ Based on the master plan, infrastructure such as roads and over 90 industrial developments, excess surface runoff will be created due to more impervious surfaces such as pavement and buildings that do not allow percolation of the water down through the soil to the aquifer. ▪ This likely negative impact could lower quantity of water percolating into the ground, hence lower water flow into Cherunya stream. The risk is that it can lead to drying of Cherunya stream especially during the dry season. ▪ The master plan has integrated a number of mitigation measures among others; roof catchment and re-use of rain water at plot level, use of porous paving in the open spaces, use of bio-swales in places with suitable gradient use of retention ponds, creating green roofs, consequently improving the chances of percolation and evaporation of storm water.
Kenya Association of Manufacturers	Energy	<ul style="list-style-type: none"> ▪ The main electricity supply for the Industrial Park shall be from the National grid. The sub-station, which is 1 km away, has two transformers of 45 MVA each. ▪ To further reduce dependence on electricity to heat and light buildings during the day, the buildings proposed in the park will have to integrate passive solar design. The objective of passive solar design is to optimize passive solar gain and cooling that will improve overall building performance through energy efficient design. Therefore, all developments within the park shall optimize application of the following passive solar design principles: building orientation, shading, natural lighting, and cross-flow ventilation and energy efficient lighting. ▪ For future sustainability of power supply for the Industrial Park, additional sources of power from solar and biomass have been proposed. Solar energy can be harnessed by incorporating solar infrastructure within the roofs of the industries and all other buildings. The roof area available for installation of solar panels is approximately 135,000 m² where there is potential for generation of about 10 MW. Additional power can be generated from biomass with the clear implication that the entire site energy needs can largely be met from these renewable sources. ▪ Nonetheless, dependence on the grid would be necessitated by the intermittence of solar power due to cloud cover and uncertainty of obtaining sustained good capacity from the biomass source.
County Director, Environment, Community Health Volunteer	Riparian Reserve Management	<ul style="list-style-type: none"> ▪ The Cherunya riparian reserve is likely to get conservation and management attention that it could not have received if the Industrial Park was not located at its current site. ▪ The master plan has provided a riparian management plan for the river. ▪ Observations in other areas have shown that where industries are constructed next to a riparian area, low-income workers tend to build informal houses on the riparian reserve. With no clear guidelines, this is likely to happen even for this Industrial Park. This will lead to loss of riparian vegetation, and aesthetics. The water in the stream is also likely to be polluted with untreated or partially treated industrial wastewater. This can affect both the riparian vegetation and the aquatic flora and fauna both at the immediate environment and downstream. ▪ Some of the design and management interventions the Industrial Park Master Plan has employed to prevent Cherunya stream from being polluted includes observing the 30m riparian reserve, creation of activity nodes to attract users into the riparian reserve park for activities such as picnics, hiking, jogging, cycling and bird watching.
CBOs, Langas	Biodiversity	<ul style="list-style-type: none"> ▪ Clearance of vegetation to pave way for construction of the proposed project will destroy the plants and microorganisms' ecosystems. Approximately 10.4 acres' green belt has been provided within the site. The green space is divided into the upper and lower segments by a road that cuts across the site. The upper segment has been designed for passive recreation while the lower segment has been designed to take a naturalistic character, planted with indigenous tree species to create an arboretum/botanical garden. ▪ Apart from safeguarding environmental (biodiversity) quality, greenery and open spaces provided within the park are meant to enhance recreational needs of local

		<p>dwellers, promote physical and mental health benefits through provision of jogging trails and bicycle trails, ameliorating local climate, improving air quality and promoting social cohesion and interaction.</p>
Kenya Association of Manufacturers, CBOs	Air Quality	<ul style="list-style-type: none"> ▪ Air pollutants from the proposed industrial park will originate from the proposed light heavy industries such as the agricultural mechanization, agro and veterinary chemicals/drugs, wood industry, fertilizer processing and packaging industrial prototypes. <p>The Master Plan has proposed several strategies that are applicable in preventing and mitigating potential air pollution that include but not limited to:</p> <ul style="list-style-type: none"> ▪ Advocacy for cleaner production technology measures and the use of green energy where possible. ▪ Conducting periodic air quality audits to determine trends in order to contain pollution dispersal and potential impacts. ▪ Ensuring Air Quality Policy compliance by the actors such as industrialists, motorists and the general public. ▪ Use of vegetation to improve air quality. This strategy forms the major green belt theme that informed planning of the park. The green belt provided in addition to the proposed riparian management plan shall play a major role in promoting air quality. Well covered with vegetation, the 10 acres of green belt can fix 24 tons of carbon or 88 tons of CO₂ per year hence reduce the Green House Gases (GHGs).***
Kenya Association of Manufacturers, Local Community Opinion Leaders, Jua Kali Sector, Women Association, Community health Volunteer	Solid Waste Management	<ul style="list-style-type: none"> ▪ A dual solid waste management system involving management initiatives from both individual industries and centrally under the stewardship of ICDC park administrator. ▪ Within each industry, waste sorting, reduction, reusing and recycling shall occur. ▪ In the long run, and specifically when the park attains an operational capacity of 60%, an industrial biogas plant be established. This approach is economical on land demand besides having other advantages ranging from cogeneration of energy, organic solid waste management, wastewater management, and does not pollute the environment as compared to typical waste management approaches like transfer stations and landfills. ▪ The industrial biogas plant facility will be developed either by ICDC or a partnership with relevant stakeholders like ELDOWAS. ▪ ICDC will also interest a private investor especially those in the renewable energy sector. Preliminary estimates show that the park can generate 30% of its total energy needs from the waste biomass.
Local Community Opinion Leaders, Jua Kali Sector, Women Association, community health Volunteer	Traffic and Noise Pollution	<ul style="list-style-type: none"> ▪ Heavy commercial vehicles will access the park through the northern entrance and exit the park through the same. ▪ In particular, the residential properties on the eastern side of the park will be protected from such excessive noise and vibrations from industrial traffic given that the road is not in close proximity to the residential estates. ▪ To ease congestion along main roads within Uasin Gishu County, it is proposed that trucks ferrying raw materials to the proposed park will supply goods at night and with an efficient logistical system it will reduce load clearance time and costs of production.
The Church, Residents Association, Business Investment Community	Cherunya Land dispute	<ul style="list-style-type: none"> ▪ As consultants, we have advised ICDC that it's our interest that this matter is resolved amicably in a timely manner, so that implementation of the project can continue as well as enabling us finalize the SEA/EIA process.
Kenya Investment Authority	Land Sizes	<ul style="list-style-type: none"> ▪ The proposed subdivision layout for parcel No. 1757 resulted into a total of 96 plots of land to sustainably support industrial park development. Out of the 96, 75 plots are exactly 1 acre. The remaining 21 are in the range of 0.7 to 2.50 acres, mainly due to factors such as location (corner plots), accommodation of easements, wayleaves and the irregular site morphology. ▪ For sustainability, the proposed subdivision has also implemented the minimum 1-acre guideline. Investors wishing to develop industries on plots exceeding 1 acre have the option to amalgamate their one acre parcels to desired sizes to a maximum of 10 acres.
Kenya National Chamber of Commerce and Industry (KNCCI)	Development Control	<ul style="list-style-type: none"> ▪ The guidelines adopted for regulating land use and development in the industrial park conform to the Kenya Constitution 2010, the National Land Policy (Sessional Paper No. 3 of 2009), the Physical Planning Act Cap 286 and Environment Management and Coordination Act. They also conform to zoning guidelines applicable in Uasin Gishu County.

		<ul style="list-style-type: none"> ▪ These guidelines are intended to promote compatibility of land uses, guidance of building design, aesthetics and more importantly order and character of physical development. Nevertheless, they allow individuality of building character, while maintaining a sense of overall harmony throughout the project and its adjacent developments. In addition, the guidelines also define how buildings complement each other through coordination of footprint size, placement, materials, colours, building mass, height, and spatial articulation. ▪ It is important to note that due to the project's proximity to residential areas, special attention is given at all times to pollution control and building sound attenuation. Essentially, these development control guidelines reflect the vision and spatial objective of the Master Plan; thus, all developments shall be expected to comply with them. In order to promote harmonious development, use and enhancing of property values within the park, there shall be need to enforce the development control measures which will form part of the lease agreement. The specific guidelines are presented in subsequent sections.
Church Community	Disaster Management (Fire Emergency)	<ul style="list-style-type: none"> ▪ Fire safety management strategies such as providing suitable means of detecting and warning against fire, adequate means of escape provision, means to restrict the passage of fire within the building, means for the building to maintain structural integrity for a pre-determined period in the event of fire, fire brigade access to exterior of building and fire brigade access to the interior of the building (firefighting shafts) have been considered and integrated in the master plan. Essentially, provisions in the Occupational Safety and Health Act of 2007 shall at all times be complied with. ▪ For example, break out spaces which are mainly the open spaces, green corridors within the park are centralized, interconnected and multifunctional in nature thus enhancing safety of the park during emergencies by acting as fire assembly points. ▪ Visual linkage has been enhanced to direct pedestrians to open space facilities/fire assembly points. Signs and notices, where necessary have been provided to help people identify escape routes, find firefighting equipment and emergency fire telephones. Notices at the building level shall be mandatory mainly to give instructions to occupants/users on how to use any fire safety equipment; the actions to be taken in the event of fire; and help for the fire and rescue service (e.g. location of fire assembly points, sprinkler valves or electrical cut-off switches). ▪ Moreover, all owners of any buildings within the park must have a procedure in place (evacuation procedure) for the safe, prompt, and efficient evacuation of the building's occupants in the event of a fire emergency requiring evacuation. This entail ensuring clear routes of travel to the place or places of safety for the building; the fire alarm signals used or available for use by the occupants; and any firefighting equipment available for use by the occupants. ▪ External fire hydrants (FH) for the three main clusters in the park have been designed with fire reserve water tanks of 200 Cubic metres (15 No.) have been provided for the entire site.
Youth Associations and Jua Kali Sector	Corporate Social Responsibility (CSR)	<ul style="list-style-type: none"> ▪ The CSR that ICDC would employ include roads, hospitals and schools that are open use, street lighting, security, storm water management, playfields and any added advantage to the neighborhoods as a result of the industrial park establishment. Also, any steps the park can take to reduce their carbon footprints are considered both good for the company and society as a whole and as part of CSR.

CHAPTER EIGHT

ALTERNATIVE LAND USE OPTIONS TO THE INDUSTRIAL PARK

8.1: OVERVIEW

The Land use zoning for the Industrial park master plan was done after considering a number of suitability factors to meet the social, economic, environmental, cultural and even political aspirations of the respective planning jurisdictions. As a result, different land uses exist which range from residential, commercial, industrial, open spaces, transportation among others in a balanced manner that promotes sustainable development. The establishment of the proposed Eldoret ICDC Industrial Park (EIIP) conforms to the zoning provisions of the land, there is need to widen the scope of potential alternative developments which may suffice particular needs other than the designated industrial use.

The SEA team identified six possible intervention options to which the land can be put to use. They include: The No Intervention Option (NIO), Agriculture Use Option (AUO), Commercial Development Option (CDO), Housing Development Option (HDO), Mixed Commercial and Housing Development Option and Eco-Industrial Park Option (EIPO). The likely environmental and socio-economic impacts of each option were assessed. The results are as reported descriptively and quantitatively as presented below:

8.2: THE NO INTERVENTION OPTION (NIO)

The proposed industrial park shall be on a 135-acre piece of land. Land is one of the finite natural resource on earth. Its optimal utilization is therefore one key factor to consider at all times. This option has the highest and most appealing environmentally and ecologically rewarding outputs. Nature shall thrive, both plant and animal on the site. Eventually, the site can end up creating a micro-climate in the urban set up, a peaceful park for the locals and promote carbon sequestration. However, if the value of the industrial land is compared to the no use option, this shall amount to massive wastage of valuable land. Based on the foregoing, the nil intervention option may not be the best use of the land.

8.3: AGRICULTURE USE OPTION

Kenya' economy largely depends on the agricultural sector, which accounted for 24% of the GDP in 2003. About 75% of Kenyans owe their livelihood to agriculture. Other than agro-production, the sector boasts a comparatively wide range of manufacturing industries, with food processing being the largest single activity. About 66% of the manufacturing sector is agro based, owing to the country's agricultural economy foundation. The agro-grain processing sub-sector is one of the leading and well-established industries and it includes major cereal foods such as maize, wheat, rice, sorghum, millet and barley among others.

Kenya being a food insecure country as it is evident by the perennial food shortages, it is important that both the national and county governments strategize on how to curb the situation. Eldoret has very conducive climatic conditions for agriculture besides being in an ecological zone suitable for maize production. It is based on this background that this project considered maize and beans production as a land use option for the 135 acres of land.

On average, an acre of land can produce 45 bags of grain maize per acre if sufficient inputs are used. This translates to about 6,075 (90kg) bags of maize every harvest season valued at Ksh. 18.225 which is once in a year. Economically, this is not an expensive investment compared to any other land use like industrial. Ideally, it may cost about Kshs 30,000 per acre totaling to slightly above Kshs 4,050,000 worth of investment per season.

This output has the potential of contributing to the economy in a number of ways inter alia farmer earnings, transport sector, warehousing, preservation and the milling industries. Environmentally, this could be a sound way of utilizing the land for it does not have any ecological footprint for no paving is anticipated. No excavation of raw materials shall be done hence no serious negative impacts on the natural resources base. On the same note, besides the dust generated during land preparation and the little emissions by the land preparation and transporting vehicles during the harvest period, this practice has no known long-term negative impacts on the air quality.

However, if this land use option is compared to others like industrial and mixed use (commercial and residential), it will be noted that this is not the most optimal way to use the land. This land is zoned for industrial use and this translates to very high land values. As a result, much as this option has the potential to contribute to food security in a piecemeal way and has no huge negative environmental impacts, it is economically an unviable option for the land.

8.4: COMMERCIAL DEVELOPMENT OPTION (CDO)

This option will focus on developing the whole 135 acres of land for commercial purposes just like a satellite CBD to Eldoret Town. This option will optimize economic benefits in its entire decision making. Commercial development shall promote the economic development of the town by providing more space for doing business. One key factor to consider is the socio-economic impact of this option to both the locals and investors. Currently, the CBD of Eldoret town is not fully utilized as it is evident by the presence of open and vacant land and low density commercial developments. As a result creating additional commercial development will lead to more underutilization of such land in the area and the bio-region. On the same note, the economic rate of return of commercial development is quite low when compared to that of industrial use. This is true if compared at different facets more so the value chain components of the same. Industrial functions have the ability to strongly support a number of economic entities ranging from agriculture, transportation, commercial, logistics, research and development. All these cannot be possible if the land is developed into a commercial center.

8.5: HOUSING DEVELOPMENT OPTION (HDO)

Housing has always been a basic human need. Developing countries, Kenya included have encountered the perennial challenge of housing shortage, more so for the low and middle income category of the population. Indeed, Eldoret has these challenges as well and if the option of a housing project is adopted, it will be handy in contributing to solving this problem. The housing shortage can be attributed to the high population influx and growth rate. The function of Eldoret town as the County headquarters has also attracted more people to the town. Given the limited land availability for urban development, 1-3 bedrooms high rise housing units with associated social amenities will be preferred. Approximately 100 units per acre for 120 acres (12,000 units).

This option would thus call for the application of a change of user from the designated use of industrial to residential. When this option is compared with industrial use with respect to economic significance, a number of observations are apparent. For instance, housing development will have a limited impact on a number of development sectors as compared to industrial.

Whereas housing shall cater for shelter and social amenities in the area, this doesn't impact significantly on the other facets of the value chain in development. Temporarily, housing shall promote the real estate industry, the building material sales, professionals (physical planners, architects, engineers, environmentalists etc.) only from inception to occupancy. Other sectors likely to benefit are service providers like water, power and waste management. On the same note, housing stock can be boosted by densifying the old public housing and redeveloping Langas into a planned high rise residence. Environmentally, housing shall have very high stress on water demand which is already scarce in Eldoret municipality.

Industrial use on the other hand has a higher potential of impacting on the value chain aspects of development. For instance, whereas the option will promote the various professional, business and service provision elements of development, industrial use shall promote the entire range from agro-production, agroforestry, transport, manufacturing, logistics, professionals, research and development. This shall also promote production for export. This will earn foreign exchange in the short, medium and long term. The housing option cannot achieve this.

8.6: MIXED COMMERCIAL AND HOUSING DEVELOPMENT OPTION

An integrated use of the land to accommodate both commercial and residential is another possible option. This shall thus call for proportionate planning to cater for the two land use activities at the site. Two approaches are possible. One, since the land is already divided into two sections by the 30M KURA road, either side can be used for either of the functions above. On the other hand, an integrated mixed use can be arrived at by integrating the functions in the form of a mini town where the residential area has a form of a commercial district within. The impacts of the mixed development on the economic, social and environmental fronts shall remain as discussed above in the housing and commercial options.

8.7: INDUSTRIAL PARK OPTION (IPO)

Industrialization has been one of the major economic drivers since the industrial revolution era. As a result, less industrialized countries in the third world countries, Kenya included have struggled to thrive economically and competitively in the global trade. It is on this backdrop that Kenya established a number of industrial development flagship projects in the Kenya Vision 2030. Industrial use of the land is an approach to revitalizing the industrial sector that has been dwindling over time. In addition, industries focus on the public value rather than individual value. As a result, the common people stand to gain more. In addition, the investors and the country at large gains economically. The declining agricultural sector both nationally and in Uasin Gishu County has been mostly due to lack of market for the agricultural produce.

The industrial option has the potential to provide market for farm produce hence boost farmer confidence to increase production in a sustainable way. A number of industrial

development options do exist to which the land can be put. For instance, the land can be used for a single major industrial investment like a mega agro-chemical industry, a mega textile or food processing industry. Much as these approaches are valid, a number of factors work against them such as investment diversification, raw material potential in the bioregion to support specialized mega industries and the economic security (both to the locals and investors). This suggests investment in a diversity of medium scale industries for the land.

8.8: QUANTITATIVE ANALYSIS OF THE ALTERNATIVE PLAN OPTIONS

To evaluate the alternatives, a scoring framework was developed as illustrated in Table 7 below. Using the criteria, professional judgment was then applied on each of the selected indicators. The rating of zero means the alternative plan in question has no –ve or +ve impact on the bio-physical or socio-economic environment. The rating of –ve 1 to –ve 2 reflects an overall negative impact on the bio-physical or socio-economic environment in growing intensity with –ve 1 representing minor negative impact while –ve 2 represents a significant negative impact. On the other hand, +ve 1 represents a minor positive impact while +ve 2 represents a significant positive impact on the bio-physical or socio-economic environment.

Table 13: Alternative Plan Options Rating Criteria

Description	Rating		Rating
NEUTRAL	0		0
	Negative		Positive
MINOR	-1		-+1
SIGNIFICANT	-2		+2
DURATION	S=Small	M=Medium	L= Long

Using the matrix, scoring was done by the SEA Team through a round table discussion. The results are as presented in Table 13 below.

As indicated in Table 8 below, the qualitative and quantitative analysis show that in the first year (short run) of plan implementation, all the six options have an overall, negative impact on the bio-physical environment. However, when considering both the bio-physical and socio-economic environment, the No Intervention Option (NIO) scored the least (-66) followed by the Agriculture Land Use Option (-16). The Industrial Park Option was leading with a score of 438 followed by the Mixed Commercial and Housing Development (421) as the second, Commercial Development as the third with a score of (382) and the Housing Development Option as the fourth with a score of 122. The Team therefore settled on the Industrial Park Land Use as the preferred land use for the 135 acres' land.

Given the results of the analysis above, this master plan has opted for an Industrial Park with a number of light industries of varied characteristics in terms of produce, turn over and raw material demands. This employs a systems-approach involving an understanding of the quantities, as well as the physical and chemical characteristics, of materials and energy flowing in, within and out of the park, in addition to the regulatory, economic and managerial aspects of the park.

In order to achieve the highest level of benefits and sustainability, the study opted for an Eco-industrial park which is a community of manufacturing and service businesses seeking enhanced environmental and economic performance through collaboration in managing environmental and resource issues, including energy, water, and materials. This shall be an industrial system of planned materials and energy exchanges that seek to minimize energy and raw materials' use, minimize waste generation, and build sustainable economic, ecological and social relationships. The proposed eco-industrial park is thus expected to integrate all the facets of a sustainably developed entity by ensuring that the economic, social and environmental factors are the guiding principles in the design, construction and management of the park.

The industrial park is expected to accommodate a range of industrial typologies mostly agro-based. These shall include the food processing industries, textile industries, agro-based industries and other logistical services. From this perspective, industry as a land use option for the park will most likely have a superior impact economically, socially and environmentally. Environmentally, the park shall employ some of the latest ecologically sensitive designs such as sustainable waste management (by applying the 3Rs), use of green energy and green infrastructure (parks/greenery, transportation conservation, solar power use) use of green architecture such as energy efficient buildings (day lighting, natural ventilations etc.), just to mention a few. Socio-economic significance shall cut across all the facets of the value chain from farmers, transport, logistics, manufacture, foreign exchange through exports, research and development, technology and entrepreneurship incubation and application.

Note:

Table 13 provides the overall weighted biophysical environment and social environment impacts of implementing all the land use options: The No Intervention Option (NIO), Agriculture Use Option (AUO), Commercial Development Option (CDO), Housing Development Option (HDO), Mixed Commercial and Housing Development Option and Industrial Park Option (EIPO).

Table 14: Evaluation Scores of Various Land Use Options

INDICATORS	NIO			AUO			IPO			MCHD			CDO			HDO		
Biophysical Environment																		
Duration	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
Biological diversity (Fauna and Flora)	-1	-1	-1	-1	-2	-1	-13	11	10	-14	10	11	-14	10	11	-14	10	11
Land degradation	-3	-3	-3	-1	-1	-1	-29	1	1	-30	2	3	-29	3	4	-28	3	4
Water quality	-3	-3	-3	-1	-1	-1	-6	2	2	-6	4	4	-5	5	5	-5	5	5
Air quality	-3	-3	-3	-7	-7	-7	-9	-1	-1	-6	1	1	-8	0	0	-9	-1	-1
Temperature increase and heat islands effect	1	1	1	-2	-2	-2	0	-2	-2	2	-1	-1	1	-2	-2	0	-3	-3
Landscape appearance	-4	-4	-4	-3	-2	-2	-17	16	16	-13	15	16	-16	17	17	-15	18	18
Increase in concrete surface	-1	-1	-1	0	0	0	-7	-7	-7	-9	-9	-9	-7	-7	-6	-9	-9	-9
Noise and vibrations	-4	-4	-4	-2	-2	-2	-5	-5	-5	-6	-6	-4	-4	-4	-3	-6	-6	-4
Conservation of green spaces	7	7	7	-1	-1	-1	11	15	15	8	16	10	11	11	13	11	11	13
Townscape	1	1	1	0	0	0	21	21	21	20	20	20	20	20	20	20	20	20
Complimentarity with existing land uses	2	2	2	0	0	0	23	23	23	21	21	21	21	21	21	21	21	21

Sub-total Biophysical Environment	-8	-8	-8	-18	-18	-17	-31	74	73	-33	73	72	-30	74	80	-34	69	75
Social Environment																		
Employment Creation Potential	3	3	3	13	12	12	26	16	16	21	11	11	20	10	10	19	9	9
Human health	-2	-2	-2	-6	-6	-6	11	21	21	10	23	23	-10	22	22	-10	22	22
Social amenities	-2	-2	-2	0	0	0	0	11	11	23	11	11	0	11	11	-1	10	10
Population increase	0	0	0	3	3	3	26	20	20	22	16	16	20	14	14	20	14	14
Improved security	-7	-7	-7	0	0	0	4	4	4	6	6	6	7	7	7	7	7	7
Foreign direct investment potential	-4	-4	-4	0	0	0	20	20	20	17	17	17	17	17	17	16	16	16
Increased value chain benefits	-2	-2	-2	3	3	3	17	17	17	14	14	14	14	14	14	13	13	13
Sub-total Social Environment	-14	-14	-14	13	12	12	104	109	109	113	98	98	68	95	95	64	91	91
Total for both Bio-physical and social environment	-22	-22	-22	-5	-6	-5	73	183	182	80	171	170	38	169	175	30	160	166
OVERALL SCORES	-66			-16			438			421			382			356		
RANKING	6			5			1			2			3			4		

CHAPTER NINE STRATEGIC ENVIRONMENTAL IMPACTS, SIGNIFICANCE, MANAGEMENT STRATEGIES AND MITIGATION

9.1: APPROACH OF ANALYSIS

From the six potential land use alternatives discussed in the previous chapter, the agro-industrial park was identified as the preferred option because it scored the highest overall social-economic and environmental benefits. Nonetheless, the proposed industrial park is envisaged to have both positive and negative social, economic and environmental impacts on the project site and the wider bioregion. The main areas of impacts include, water resources, energy, riparian reserve, solid waste, air quality, sound, bio-diversity, (traffic) transport, housing, landscape and land use.

The Master Plan for the proposed industrial park has employed various environmental management strategies guided by applicable policy, legal, and other regulatory frameworks. In addition, six overarching principles have guided the conceptualization, planning and design of the master plan to ensure that sustainable industrial activities are achieved both in the short and long term. These principles include; sustainability, ecological quality, economic vitality, social equity, technological innovation and innovative zoning.

Conversely, these principles have guided the process of impact analysis and the assessment criteria. The assessment sought to predict the significance (importance) of social, economic and environmental effects/risks of the proposed industrial park. The assessment criteria identified the likely changes to baseline conditions as a result of implementing the proposed Master Plan. The changes are described as much as possible in terms of their: geographical scale; magnitude of the impacts; time scale over which the impacts could occur; probability of the impacts occurring; frequency/rarity of occurrence of the impacts; temporary or permanent nature of the impacts (reversible or irreversible); and positive or negative attributes of the impacts.

Based on these parameters, an environmental risk factor has been calculated for each potential impact by assigning each parameter a score – *see table 14*. The environmental risk factor is a function of: [Extent + Duration + Magnitude + Frequency + Reversibility] multiplied by Probability factor. The formulae can be summarised as: {ERF = (GC + M + D + F + R) x (P)}.

Where numerical information was not available, the assessment was based on professional judgement – with reference to relevant legislation, regulations and policy. Therefore, the aim of this chapter is to describe the type, nature and significance of anticipated social, economic and environmental impacts. It highlights enhancement measures for positive impacts and mitigation strategies for negative impacts as adopted by the Master Plan. Further, the chapter provides a synopsis of how the proposed project is linked to various policies, plans and programs (PPPs).

Table 15: Criteria for Environmental Risk Analysis

No.	Parameter	Element	Score
1.	Coverage (Extent or Geographical Scale)	Site Level	1
		Site and its immediate Environs	2
		County Level	3
		Regional Level (North Rift)	4
		National Level (Country)	5
		International (Beyond Kenya)	6
2.	Magnitude	Small and will have no effect on the environment	1
		Minor and will not result in a significant impact on the environment	2
		Low and will cause a slight impact on the environment	3
		Moderate and will cause a moderate impact on the environment	4
		High and will cause a major impact on the environment	5
		Very high and will result in a complete destruction of the environment	6
3.	Duration	Very Short (<1 year)	1
		Short (>1<5 Years)	2
		Medium *(>5<10 years)	3
		Long (>10<15 years)	4
		Very Long (>15 years)	5
4.	Frequency	Rare	1
		Less frequent	2
		Frequent	3
		Highly frequent	4
		Continuous	5
5.	Reversibility	Highly Reversible	1
		Moderately Reversible	2
		Reversible	3
		Partially Irreversible	4
		Completely Irreversible	5
6.	Probability	Highly improbable (<20% chance of occurring)	1
		Improbable (20<40% chance of occurring)	2
		Probable (40<60% chance of occurring)	3
		Highly probable (60<80%)	4
		Definite (>80% chance of occurring)	5
NOTES:			
a. Secondary (indirect) – occurs at a distant from the direct result or as a result of the complex			
b. Cumulative – small effects from different sources			
c. Synergistic – effects that could interact to produce a new total effect that could be greater than the sum of the individual effects.			

9.2: SOCIO-ECONOMIC IMPACT ANALYSIS

9.2.1: Population Influx

a) Profile

For the last 50 years, world population multiplied more rapidly than ever before, and more rapidly than it is projected to grow in the future. In 1950, the world had 2.5 billion people; and in 2005, the world had 6.5 billion people. By 2050, this number could rise to more than 9 billion. The current (2016) population of Kenya is approximately 47,690,917 based on the latest United Nations estimates. Kenya population is equivalent to 0.63% of the total world population ranked number 29 in the list of countries (and dependencies) by population. According to the 2009 Population and Housing Census, the total population of Uasin Gishu County where the proposed industrial park is, stood at 894,179. At an inter-censal population growth rate of 3.8%, the total population is projected to grow to 1,211,853 by 2017.

b) Potential Positive Impacts

The proposed industrial park envisages contributing in the creation of a better life and improving human wellbeing. With the establishment of the proposed project, it is foreseen that there would be a possible population influx of approximately 250,000 people, in search of employment. As a positive impact the population will provide labour (skilled and unskilled) for the proposed project, invest in different businesses as well as provide market for processed products from the park. This increase in population will also lead to social integration of various cultures in addition to ensuring that the government receives more tax from an economically empowered citizenry.

c) Potential Negative Impacts, Significance and Mitigation

Some of the negative impacts of population influx include; pressure on existing infrastructure and social amenities such as schools, hospitals and recreational grounds, increase in social ills, and proliferation of informal settlements. Usually movement of populations due to a development is not easy to control and may depend on broader government strategies such as de-concentration of major developments. It is therefore not possible for the proposed development to identify measures that would be used to stop population influx to Eldoret. Nonetheless, the proposed project has put in place measures to ensure that key infrastructure and amenities that would be required will either be provided in the park or in collaboration with the existing agencies. For example, the park will have a green park and a health facility. In addition, the local schools will be supported to through social corporate responsibility. Subsequent sections of this chapter outline in detail some of these mitigation measures.

9.2.2: Housing Sector

a) Profile

Given the current demographic trends, Kenya will be a predominantly urban country by 2030. The estimated current urban housing needs are 150,000 units per year. It is estimated that the current production of new housing in urban areas is only 20,000-

30,000 units annually, giving a shortfall of over 120,000 units per annum. This shortfall in housing has been met through proliferation of informal housing.

b) Potential Positive Impacts

The proposed development will spur real estate developers (both public and private) to provide more housing amenities (includes the dwellings, various community facilities and services such as water supply, drainage facilities, solid waste management, sanitation etc.) to accommodate the industrial workers/business person's population influx. As a result, real estate development, which contributes over 7.5 percent to the country's GDP, will gain a robust growth around the proposed project. Decent and affordable housing will be fundamental to the health and well-being of people and to the smooth functioning of proposed project activities since housing sector is the focal point of commercial industrial administrative, health, educational and recreational activities required by any population.

c) Potential Negative Impacts, Significance and Mitigation

Implementation of the proposed industrial park will create an acute demand for housing for all the three categories of workers that include high, middle and low income with higher demand being for the low-income group. This will in turn lead to increase of rents hence income for land owners as well as land prices which are likely to shoot but also the low-income workers are likely to be pushed out of the area as a result of the increase in house-rent. In such a scenario, negative impacts such as proliferation of informal settlements and overcrowding may escalate.

According to the CDIP 2013-2018 for Uasin Gishu County, there is a general shortage of decent housing in almost all the urban and trading centers in Uasin Gishu County. The county has land that could be utilized to provide housing. However, there are no immediate plans to construct low cost decent housing. This is one obvious opportunity for the County Government to forge a public-private sector partnership project in housing development.

To alleviate the above challenges associated with demand and supply of housing as a result of the proposed development, its recommended that the Uasin Gishu County government should enter into housing development public-private partnerships (PPPs) to ensure that there are sufficient houses for the industrial park workers and can identify other incentives to encourage individual/private developers to come up with decent, affordable low cost housing.

As a long-term strategy, the government should also look at ways of unlocking land supply since land is usually the largest real-estate expense, securing it at appropriate locations can be the most effective way to reduce costs; reducing housing construction costs; improving operations and maintenance and lowering financing costs for buyers and developers to guarantee decent and affordable housing for all.

Provision of housing for low-income workers will eliminate the risk of emergence or expansion of informal human settlements. The same category of workers will not be pushed out of the locality because of high rents however, increase in land prices and prices of houses may not change with the mitigation measures. With mitigation, the

Environmental Risk Factor (ERF) for housing will drop by 53.3% to 140. This suggests that the housing situation needs to be seriously considered to reduce the negative impacts of implementing the Industrial Park Master Plan. Table 16 and 17 illustrates the ERF factor analysis for housing.

Table 16: ERF for Housing Without Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Informal housing	2	3	5	5	1	5	80
Low-income workers likely pushed out.	2	3	5	5	3	5	90
Increase in Land prices.	2	2	3	3	3	5	65
Increase in housing price	2	2	3	3	3	5	65
Total							300

Table 17: ERF for Housing with Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Informal housing	1	1	1	1	1	1	5
Low-income workers likely pushed out.	1	1	1	1	1	1	5
Increase in Land prices.	2	2	3	3	3	5	65
Increase in housing Price	2	2	3	3	3	5	65
Total							140

9.2.3: Social Amenities

a) Profile

Social amenities such as schools, recreational facilities and health centres are crucial to creating sustainable communities since they enhance unity, instills a sense of care, and encourages high morals and competitiveness. In modern times, basic social amenities not only guarantee peoples' happiness and welfare but also promote security and socio-economic development of a nation or state.

b) Potential Positive Impacts

Population and demographic factors influence the demand for social amenities. The proposed development has integrated an array of social amenities, which will benefit the

wider local community. Some of these amenities include health facility, jogging trail, and Green Park.

c) Potential Negative Impacts, Significance and Mitigation

With an estimated 250,000-population influx as a result of the proposed project, both population size and age structure will influence demand and supply of social amenities. Based on Physical planning handbook guidelines this catchment population will demand additional 6 primary schools and 3 secondary schools. On the other hand, based on WHO standards, an additional 2 health centre facilities will be required to serve the additional population.

The proposed project will host 1 health centre within the proposed ICDC complex to cater for health needs of the industrial workers and the neighbourhood population. In addition, the master plan has provided a belt of green public open space designed to enhance recreational needs of local dwellers and industrial park workers, promote physical and mental health benefits through provision of paved pedestrian walkways, jogging trails and bicycle trails.

These provisions will improve air quality and promote social cohesion and interaction. Lastly, as a corporate social responsibility, ICDC will invest in school's improvement initiatives such as renovation and expansion of classrooms that will benefit neighbouring educational institutions and the society at large. With mitigation, the ERF for social amenities will drop by 76.4 % as indicated in table 18 and 19 below. Suggesting that despite the mitigation, there will still be some small residual negative impacts.

Table 18: ERF for Social Amenities Without Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased demand for social amenities.	3	5	5	5	4	4	88
Increased supply of social amenities.	3	3	2	3	3	4	56
Total							144

Table 19: ERF for Social Amenities With Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased demand for social amenities.	3	2	5	2	2	1	14
Increased supply of social amenities.	3	2	2	1	2	2	20
Total							34

9.2.4: Job Creation and Employment

a) Profile

Unemployment rate in Kenya as at 2015 estimates was 38% of the population (40 million). According to UNDP (2013), 80% of Kenya's 2.3 million unemployed people are between the ages of 15-34 years. Approximately 841,000 new jobs were created in 2015 (GoK, 2016). It is apparent that only a fraction of the unemployed population got jobs. Some of the reasons for slow growth in employment opportunities include sluggish economic growth and corruption among others. Estimates also indicate that 75% of Kenya's labor force is employed in agriculture while 25% is in industry and services.

b) Potential Positive Impacts

The proposed industrial development is envisioned to generate approximately 40,000 indirect employments to farm families to produce various agricultural raw materials such as crops and livestock. Over 200 transporters, and about 10,000 factory workers would gain employment on fulltime basis. This will sustain about 50,000 households that could trickle down to a total of approximately 250,000 people based on household average size of 4.5. A gross income of Ksh. 912,912,000 and Ksh. 43,320,000 per year to farmers and transporters respectively would be generated. For example, horticultural enterprises on average 5 persons will be employed on full time basis per season for every hectare of land under horticultural production. In turn, income to farmers (gross margin) will be an average income of Ksh. 477,700 per hectare per season.

c) Potential Negative Impacts, Significance and Mitigation

The proposed project will lead to increased supply of jobs/ employment, labour force for both the skilled and unskilled. As a result, more young men and women will leave their families and purposely move to Uasin Gishu County to seek employment and livelihoods within the proposed project. For the employed population, there will be increased wages that will eventually increase money circulation within the area leading to these young men and women engaging in social vices such as increase in immorality, drug abuse prostitution, hence spread of HIV and sexually transmitted diseases, breaking of families among other negative effects.

On the other hand, the proposed development will not have the potential to absorb all the job seekers. Apart from this leading to the unemployed group engaging in other survival means that will trigger the above mentioned social vices, there will be also increased insecurity and crime such as theft, burglary among others.

The project proposes 1 police post within ½ km radius that will serve the proposed industrial park and its environs against insecurity risk. In addition, the management of the park will have to integrate HIV/AIDS prevention and treatment within the proposed health center in the park. The park's management will also conduct periodic seminars to educate the workers on these social ills. This is likely to reduce the environmental risk factor by 53.7% as shown in the table 20 below.

Table 20: ERF for Job creation and employment Without Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increase in social vices such as immorality, drug abuse prostitution, hence spread of STDs and breaking of families	3	2	4	3	3	3	45
Increased insecurity and crime	3	5	5	5	3	4	84
Total							129

Table 21: ERF for Job creation and employment With Mitigation

Impacts	Geographical Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increase in social vices: immorality, drug abuse prostitution, hence spread of STDs and breaking of families	2	2	3	2	3	2	24
Increased insecurity and crime	2	2	3	3	2	3	36
Total							60

9.2.5: Agricultural Sector

a) Profile

Performance of Kenya's agricultural sector has a strong correlation to the overall national economy. In 2015, the close linkage between agriculture and the overall economy emanated from its dominance in Kenya's economy in terms of contribution to income generation, employment creation, food security and raw materials for industrial development. For Kenya to attain the status of being globally competitive, the Vision 2030 economic pillar is poised to deliver the 10% annual growth rate of GDP from: tourism; agriculture; manufacturing; and the service sector.

b) Potential Positive Impacts

The proposed project is envisaged to increase demand for agriculture based raw materials from crops (cotton, vegetables, fruits etc.), livestock, fisheries and forestry sub-sectors. This will lead to an impact that will catalyze increased production, guarantee food security as well as make available produce for export hence foreign exchange income earner. Essentially, the proposed project being an agro-based industrial park

aims at adding value to agricultural produce/intermediates/residues, both food and non-food, by processing into products, which are marketable, usable or edible; or by improving storability, or by providing the link from farm to market.

This will be achieved through an innovative, commercially oriented and modern agriculture, livestock and fisheries processing industries to be hosted within the industrial park. As a result, agricultural raw material outputs such as clothes from textile industry, food and animal feeds, vegetable and fruits products produced from the park are likely to meet the growing Kenya's population demand at reduced cost and also enable Kenyan crop products, meat, dairy, wood and processed leather products to meet international marketing standards. These interventions are expected to generate an additional approximately Ksh.40 billion increase in national GDP.

c) Potential Negative Impacts, Significance and Mitigation

With the implementation of the proposed industrial park, increased demand for agricultural produce and competition for agricultural land may lead to negative effects to the economy among others: food shortages, inefficient markets, increased demand for seeds, agro chemicals, farm equipment, transport and labor costs as well as food insecurity if the external prices for processed products fetch lower prices. In addition, the wood industry will require wood supply from the forest ecosystem that will upsurge deforestation leading to the land degradation, climate change effects, increased greenhouse gases and desertification.

Mitigation of any negative impacts in the agricultural sector will require wider participation of both the national and county government agencies. This is due to the macro nature of the sector. Nonetheless, these impacts if any would not be significant. Some of the strategic measures proposed include: transforming key institutions in agriculture and livestock to promote household and private sector agricultural growth; deliberate efforts to improve livestock production in terms of breeding, feeding, routine animal husbandry practices, marketing, pests and disease control; development and commencement of the implementation of a 3-tiered fertilizer cost reduction programme; development of an agriculture land use master plan; promotion of agroforestry, tree planting projects afforestation and reforestation programmes within the ASALs and water towers through the REDD+ initiatives; and increased productivity of crops and livestock through sustainable agriculture (better utilization of high and medium potential lands, preparation of new lands for cultivation by strategically developing more irrigable areas in arid and semi-arid lands for both crops and livestock; and by improving market access to small holders through better marketing).

These strategies will lead to agricultural sector's environmental risk factor to drop by 76.4 % as indicated in table 22 and 23 below. Suggesting that with mitigation, the residual negative impacts of the proposed industrial park to the agricultural sector will be minimal and insignificant.

Table 22: ERF for Agricultural Sector Without Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increase in demand for raw materials	5	4	3	3	1	4	64
Competition for agricultural land	5	4	2	3	2	4	64

Food shortages	3	4	3	3	1	2	28
Inefficient markets	4	5	3	4	3	4	76
Increase in demand for seeds, agro chemicals, farm equipment	4	3	2	4	2	5	75
Increased transport costs	5	3	1	5	5	5	95
Increased labor costs	4	5	3	5	3	5	100
Deforestation	5	5	4	5	2	5	105
Total							607

Table 23: ERF for Agricultural Sector With Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increase in demand for agriculture based raw materials	5	3	1	2	1	2	24
Competition for agricultural land	5	3	1	2	2	2	26
Food shortage/Insecurity	2	3	2	2	1	2	20
Inefficient markets	2	2	2	3	2	2	22
Increase in demand for seeds, agro chemicals, farm equipment	3	2	2	3	2	3	36
Increased transport costs	3	2	1	3	3	2	24
Increased labor costs	2	3	2	3	2	3	36
Deforestation	4	3	3	2	2	3	42
Total							230

9.2.6: Textile Industry

a) Profile

Globally, textile and clothing nominal sales ceded -4% in 2015 and were crippled by low commodity prices (cotton -15%, wool -7%, and manmade fibres 1%) and multiple currency depreciations worldwide, particularly in emerging markets. As the latter produce about 80% of global output, poor economic prospects in Brazil and Russia and China's shift towards services will continue to weigh on the sector. Gross output would hence decrease by -1% in 2016. Looking forward, demand will be fuelled by population growth (+500mn inhabitants by 2020) and higher incomes that will substantially increase household purchasing power. GDP per capita is expected to keep rising, increasing by +4% annually between 2015 and 2020.

Kenya's textile and apparel sector has the potential of playing a key role in anchoring the country's journey into middle income status and in serving as a source of gainful employment for its fast growing, young population. Approximately 70 percent of Kenyan

apparel firms have a US-dominant market orientation, meaning that at least 80 percent of their output is sold to US markets.

Kenya has 52 textile mills, of which only 15 are currently operational albeit at less than 45 percent of total capacity. If they were to operate at their installed capacity, they would create demand for cotton lint of 60,000 bales per annum, on top of the current annual demand of 120,000 bales to be able to meet the increasing demand for the increasing Kenyan population. But, the existing mills operate using out-dated technology and suffer from low levels of skilled labour and low productivity. Approximately 170 are medium and large, while upwards of 74,000 are small and micro companies. According to Kenya Apparel and Textile Industry, Diagnosis, Strategy and Action Plan, twenty-one companies operate in the EPZ, employing an average of 1,800 people per company.

b) Potential Positive Impacts

The proposed project seeks to construct 19 small to medium scale textile industries. As a manufacturing industry, the proposed textile industries will offer opportunities for increased value capture and streamlined trade logistics, and for the building of skills and experience from the factory floor to management level. Based on these foundations, it therefore serves as a potential gateway to other manufactured goods, offering opportunities for Kenya to capture an increasing share of global trade and to advance economic diversification.

In addition, the proposed 19 textile industries, presents an opportunity as an economic sector and as a potential spring board for further advancement into manufacturing—playing a substantial role in underpinning the African Growth and Opportunity Act (AGOA). These gives most Sub-Saharan Africa (SSA) firms duty free, quota free access to the United States, offering a substantial competitive advantage over other textile-apparel exporting countries. Therefore, the trade agreement will play a pivotal role in the growth of the Park's textile-apparel sectors.

c) Potential Negative Impacts, Significance and Mitigation

The proposed project's 19 textile industries will demand additional over 38,000 hectares of land to be put under cotton. This will increase competition for agricultural land, increased use of pesticides and herbicides (30% of the cost of seed cotton production goes to pesticides and herbicides).

At transport level, air pollution and traffic congestion will emanate from increased number of vehicles transporting seed cotton from farms to factory, yarn and thread from factory, manufactured fabric and apparels. Furthermore, it's estimated that 17 to 20% of industrial water pollution may come from these textile industries. For instance, wastewater will originate from different processes of textile making, such as: slashing/sizing, scouring, bleaching, heat setting, dyeing and printing. Air pollution from textile mills will generate nitrogen and sulphur oxides from its boilers as well as other causes of air pollution during resin finishing and drying operations, printing, dyeing, fabric preparation, and waste-water treatment to plants.

The proposed project takes cognizance of the above negative effects and to mitigate them it seeks to promote use of green technology in the textile sector such as using energy efficient and emission reduction facilities. Green manufacturing will also be

promoted using renewable energy systems and clean technology equipment and the greening of manufacturing—reducing pollution and waste by minimizing resource use, recycling and reusing waste, and reducing emissions; as well as use of larger vehicles to minimize the number of trips hence congestion and air pollution.

For sustainability to be realised in the long run, the project recommend Kenya’s textile sector implementation priorities to focus on among others promoting use of Arid and Semi-arid land to grow high yielding cotton varieties through Irrigation agriculture; developing access to new market opportunities where competition is based on factors other than cost alone; building skills to address productivity issues at the managerial, technical, and factory floor level—to compensate for its relatively higher wages—, as well as to cater to higher quality requirements of non-commodity market niches; and developing and supporting such interventions will require an institution to play a leadership and convening role on issues specific to the textile-apparel sector, ensuring public and private sector collaboration, and coordination among different private actors.

As indicated in Table 24 and 25 below successful implementations of mitigation measures will lead to the reduction of the total environmental risk factor for Textile Industry for the proposed project by 65.7%. This is an indication that the textile industry will thrive within the proposed project while impacting less on the environment.

Table 24: ERF for Textile Industry Without Mitigation

Impacts	Geographical Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased demand for Cotton Production	5	4	3	2	1	5	75
Increased pollution (Land, water, air)	5	5	4	5	2	5	105
Increased traffic	4	3	5	5	3	5	100
Total							280

Table 25: ERF for Textile Sector with Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased demand for Cotton	1	2	1	2	1	1	7
Increased pollution (2	2	2	5	1	2	24
Increased traffic	2	2	2	5	2	5	65
Total							96

9.3: ENVIRONMENTAL IMPACT ANALYSIS

9.3.1: Water Resources

a) Profile

The total volume of water resource on Earth is about 1,400 million km³ of which only 2.5 per cent, or about 35 million km³, is freshwater. The usable portion of these sources is only about 200 000 km³ of water — less than 1 per cent of all freshwater and only 0.01 per cent of all water on Earth. Groundwater represents about 90% of the world's readily available freshwater resources, and some 1.5 billion people depend upon groundwater for their drinking water. According to WWF, although Africa appears blessed with abundant water resources: large rivers include the Congo, Nile, Zambezi and Niger and Lake Victoria is the world's second largest, it is the second driest continent in the world, after Australia, and millions of Africans still suffer from water shortages throughout the year. Shortages are attributed to problems of uneven distribution - sometimes there is much water where there are fewer people - and also to management of existing supplies that could be improved.

Kenya has a land mass area of approximately 592,000 km², of which 2/3 are permanent pastures, 1/5 wilderness, and comparatively low land proportions occupied by either forests or cropland. Kenya is mainly an agricultural country with an expanding economy whose basic element for development is water. The annual quantity of renewable fresh water resources is estimated at 20.2 billion m³ comprising 19.59 m³ of surface water and 0.62 billion m³ of ground water. Given the country's population of about 40 million people, per capita supply is approximately 696 m³/person per year, which makes Kenya a water scarce country since the global benchmark is 1,000 m³/person per year.

As Kenya seeks to transform into a newly industrialised country by the year 2020, the twin challenges it will face will be to provide water to both agriculture (irrigation) and urban areas and to promote industrialization without undermining its water resource base. Thus, prudent management of water resources should be an essential component of any development proposal. The industrial park master plan has three key impacts on the water resources. They include increased demand for portable water, increased generation of wastewater and storm water. These are discussed below.

b) Potential Positive Impacts

Integrated sustainable water resource management through the 3Rs (Reduce, Reuse, Recycle) is one of the approaches the proposed project has employed towards ensuring proper use and management of water resources. Indeed, the industrial park's water resource plan and management framework has taken into consideration all the competing demands for water by individual industries and allocated water on an equitable basis to satisfy all uses and demands. Re-use and recycling of industrial wastewater, rainwater and excess surface run off (storm water) is aimed to reduce demand for freshwater supplies from sources such as dams, rivers, boreholes, shallow wells and springs within Uasin Gishu County.

Moreover, recharging of groundwater resources, existing reservoirs and aquifers has been enhanced within the proposed project through provision of green infrastructure and

artificial methods of groundwater recharge such as bioswales, retention ponds, recharge pits, rain gardens and percolation ponds. Thus, many efforts in water resource management of the proposed project are directed at optimizing the use of water and in minimizing the negative environmental impact of water use on the natural environment.

c) Potential Negative Impacts, Significance and Mitigation

Water provision of portable water in Eldoret and its environs is under the jurisdiction of Eldoret Water and Sanitation Company (ELDOWAS) and Lake Victoria North Water Service Board. Quality water is paramount to the operation of the Industrial Park. Water supply is normally designed for the ultimate demand. For this case, it is 20 years that run from 2020 to the year 2040). However, following the proposal for phasing of implementation of the Master Plan, the design has also been examined using the initial (5 years) and the future (10 years) demand projections. Emergency firefighting facility demands have not been considered for the regular demand but have been provided for in the supply system capacity design.

The likely negative impacts of the increased demand for portable water are that, the current consumers will either receive very little, or receive no water at all. This is because the water could be diverted to supply the industrial park since the park is a heavy consumer and easier and cheaper to manage the water supply than many small scale consumers. On the other hand, the industrial park may not get sufficient water for operating optimally. This will in turn result in underutilization of the industrial park capacity hence the objectives of its creation will not be met.

Based on the proposed project phasing, the estimated water demand is at 192, 256, 320 m³/day for initial (year 2020 at 60% occupancy), future (year 2030 at 80% occupancy) and ultimate (year 2040 at 100% occupancy) respectively. The initial phase form about 1.9% of ELDOWAS capacity of 36,000 m³/day supply. This demand will add to the 10,000 m³/day deficit currently experienced by ELDOWAS. A combination of rainwater harvesting, boreholes and public piped water from ELDOWAS has therefore been considered for possible water sources for the proposed project.

The proposed project operations will also lead to the generation of gray water, black water, and industrial wastewater estimated to be 637, 755 and 944 cubic metres for initial, future and ultimate respectively. The method selected for wastewater treatment for the park at the Central Effluent Treatment Plant is the use of simple, low cost, low maintenance and efficient Waste Stabilization Ponds (WSP). Grey water shall undergo recycling at the plot level. The neutralized wastewater shall then be channeled to the Central Effluent treatment plant for further treatment before discharge into the ELDOWAS main sewer line. The industrial wastewater and black water shall then be treated to conform to the EMCA (Water Quality) Regulations 2006 (Schedule 13 on Standards for Effluent Discharge into Public Sewers).

Based on the master plan, infrastructure such as roads and over 90 industrial developments, excess surface runoff will be created due to more impervious surfaces such as pavement and buildings that do not allow percolation of the water down through the soil to the aquifer. This likely negative impact could lower quantity of water percolating into the ground, hence lower water flow into Cherunya stream. The risk is that it can lead to drying of Cherunya stream especially during the dry season.

To alleviate this effects that might translate into public health risks, ecosystem disturbance and aesthetic impact to water resources, the master plan has integrated a number of mitigation measures among others; roof catchment and re-use of rain water at plot level, use of porous paving in the open spaces, use of bio-swales in places with suitable gradient use of retention ponds, creating green roofs, consequently improving the chances of percolation and evaporation of storm water.

Overall, without mitigation, the environmental risk factor (ERF) will be high estimated at 285 with wastewater having the highest negative impact while portable water will have a slightly lower negative impact. With mitigation, the ERF will drop by 94% to 17 from 285 – see table 26 and 27. This suggests that with mitigation, the residual environmental impacts on the water resource will be minimal.

Table 26: Water Resources Without Mitigation

Impacts	Geographic Coverage (GC)	Magnitude (M)	Duration (D)	Frequency (F)	Reversibility (R)	Probability (P)	ERF
Portable water	2	5	5	5	1	5	90
Waste Water	2	5	5	5	3	5	100
Storm Water	1	5	5	5	3	5	95
Total	5	15	15	15	7	5	285

Table 27: Water Resources With Mitigation

Impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Portable water	2	1	1	1	1	1	6
Waste Water	2	1	1	1	1	1	6
Storm Water	1	1	1	1	1	1	5
Total	5	3	3	3	3	1	17

9.3.2: Energy Resources

a) Profile

The worlds energy resources can be divided into fossil fuel, nuclear fuel and renewable resources. About 16% of global final energy consumption presently comes from renewable resources, with 10% of all energy from traditional biomass, mainly used for heating, and 3.4% from hydroelectricity. New renewables (small hydro, modern biomass, wind, solar, geothermal, and biofuels) account for another 3%. Renewable energy

sources are growing rapidly and are now cost competitive with fossil fuels in many markets and are established in Africa and the world at large as mainstream sources of energy. This is majorly due to political considerations over the security of supplies, environmental concerns related to global warming and sustainability.

The Kenya energy sector relies on three main sources of energy, biomass, petroleum and electricity, at 68%, 21% and 9% of total energy consumption in Kenya. In the past decade, the country has grappled with the challenge of unreliable, expensive and unsustainable energy use supporting a stagnating industrial and manufacturing base. This is due to aging energy infrastructure that can no longer meet the modern-day requirements as envisaged in the country's economic blueprint, the Kenya Vision 2030. Sustainable, competitive, affordable and reliable energy for all citizens is a key factor in realization of the Vision and so is the proposed industrial project.

Industries are one of the largest consumers of energy. Implementation of the industrial park will create demand for various forms of energy for different purposes. This will include electricity, natural gas, Liquid Petroleum Gas (LPG), Petrol, Diesel, solar and biomass in varying quantities depending on the need and activity. This will have both positive and negative impacts on energy as a resource. The Industrial Park Master Plan has employed various strategies to provide for the required energy, enhance the positive and mitigate the negative impacts.

b) Potential Positive Impacts

The proposed project is estimated to accommodate 46 basic light industries and 27 light-heavy industries, which are all consumers of energy resources. Due to climate change concerns, national energy policy direction, increasing in green jobs, global warming and other ecological as well as economic concerns, the master plan provides for use of renewable energy sources namely: solar and biomass. Energy efficiency and renewable energy are said to be the twin pillars of sustainable energy use. As a result, various efficient energy strategies and techniques are proposed within the park such as incorporating solar infrastructure within the roofs of all the industries, green building designs, generation of energy from solid wastes with the overall goal to reduce energy and production cost, reduce carbon footprints control global emissions of greenhouse gases.

c) Potential Negative Impacts, Significance and Mitigation

The main electricity supply for the Park shall be from the National grid. The sub-station, which is 1 km away, has two transformers of 45 MVA each. At peak load the transformers are currently loaded at 50% and 40% respectively, leaving an available capacity of approximately 50 MVA, which is well above the predicted future load for the Industrial Park of 10 MVA. This means that there is capacity to meet the present and future load from this nearby sub-station.

Some of the key negative impacts on electricity sub-sector include; visual obstruction of the overhead power line, electricity related fire accidents due to installation and other faults, electricity related electrocutions due to open live wires, electromagnetism created by high voltage magnetic fields that could affect human health, over dependence on the

national grid for supply of electricity, and inefficient utilization of the available energy supplies.

To mitigate these impacts, a number of strategies have been proposed. Through an overhead power line, power will be tapped from the nearby substation at 33kV for the transmission of the approximately 15 MVA bulk power to a second 33kV/11kV substation that is to be established at the north-western corner of the Industrial Park. From this second substation, an underground 11kV high-tension ring operated as open loop will traverse the site looping power to 10 Ring Main Units/Transformers/Feeder Pillars housed in strategically located transformer rooms erected at various points on the site.

To ensure establishment of a safer and aesthetically more appealing distribution of power. It is proposed that each transformer be of 1MVA, 11kV/415V capacity. Each of these transformers shall then feed power to a feeder pillar, which then feeds neighbouring buildings/installations via an underground duct system and armored cables. Appropriate load break and circuit breakers shall be incorporated to suit demands of the various consumers.

The electrical power infrastructure Master Plan, detailed designs and installation work shall conform to the following codes/regulations: The current edition of the IEE Wiring Regulations, BS 7671; Relevant International Standards; Uasin Gishu County By-Laws; Communication Authority of Kenya (CAK); The Specification and accompanying documentation and Drawings; Working drawings produced by the contractor and approved by the engineer; The Kenya Energy Act; The Energy (Electricity Licensing) Regulations of the Energy Act; The Kenya Electricity Grid code; The Electric Power (Electrical Installation Work) Rules; KPLC Regulations and Standards, and any other duly constituted authority's regulations having jurisdiction over the works.

To further reduce on dependence on electricity to heat and light buildings during the day, the buildings proposed in the park will have to integrate passive solar design. The objective of passive solar design is to optimize passive solar gain and cooling that will improve overall building performance through energy efficient design. Therefore, all developments within the park shall optimize application of the following passive solar design principles: building orientation, shading, natural lighting, and cross-flow ventilation and energy efficient lighting. This is achievable through:

- **Building orientation:** The orientation of buildings on the plot takes advantage of solar reception hence enabling natural lighting, ventilation, heating and cooling.
- **Sun shading devices:** the design prevents internal heating from direct sunlight thus minimizing the need for cooling. Street-facing facades shall be prominently glazed and appropriately shaded from solar heat gain using external shading devices (overhangs, directional louvers and shutters). Sun shading devices have been provided for all openings exposed to solar heat gain.
- **Natural lighting:** this shall reduce energy use by relying on natural light through design. To achieve a suitable level of natural lighting of interior spaces, all openings shall be strategically placed. High-level (clerestory) operable windows and vent openings shall be provided within the industrial building typologies to ensure cross ventilation and day lighting. Natural daylight provides less heat gain than most types of artificial light for equivalent lighting levels. Skylights and

clerestory windows enable natural daylight to permeate the building without loss of privacy or usable floor space. Skylights admit daylight and distribute it evenly thereby saving energy and improving visual comfort levels.

- **Cross ventilation:** Cross ventilation shall be achieved through orientation of openings and provision of side setbacks that allow cross ventilation through secondary facades.
- **Energy efficient lighting:** Involves the installation of high efficacy fittings and occupancy control systems designed to shift utility demand at off-peak hours.

For future sustainability of power supply for the Industrial Park, additional sources of power from solar and biomass have been proposed. Solar energy can be harnessed by incorporating solar infrastructure within the roofs of the industries and all other buildings. The roof area available for installation of solar panels is approximately 135,000 m² where there is potential for generation of about 10 MW. Additional power can be generated from biomass with the clear implication that the entire site energy needs can largely be met from these renewable sources. Nonetheless, dependence on the grid would be necessitated by the intermittence of solar power due to cloud cover and uncertainty of obtaining sustained good capacity from the biomass source.

Overall, without mitigation, the environmental risk factor (ERF) will be moderate estimated at 105 with biomass energy use having the highest negative impact while electricity and gas will have a lower impact. With mitigation, the ERF will drop to from 105 to 15. Suggesting that despite the mitigation, there will still be a small residual negative impact. Hence, sufficient attention should be given to reduction of biomass energy since it records the highest environmental risk.

Table 28: ERF Without Mitigation

Impact	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased demand for electricity	1	1	1	1	1	1	5
Increased demand for LPG	1	1	1	1	1	1	5
Increased demand for biomass	4	4	5	5	1	5	95
Total	6	6	7	7	3	-	105

Table 29: ERF with Mitigation

Resource	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased demand for electricity	1	1	1	1	1	1	5
Increased demand for LPG	1	1	1	1	1	1	5
Increased demand for biomass	1	1	1	1	1	1	5
Total	3	3	3	3	3	3	15

9.3.3: Impacts on the Riparian Reserve

a) Profile

A riparian zone or riparian reserve is the interface between land and a river or stream. According to the Land Act Cap 280 of 2012 a “riparian reserve” means the land adjacent to the ocean, lake, sea, rivers, dams and other watercourses. The Cherunya stream runs along the western boundary of the proposed industrial park.

b) Potential Positive Impacts

The Cherunya riparian reserve is likely to get conservation and management attention that it could not have received if the Industrial Park was not located at its current site. Indeed, the Master plan has provided both the design and the management guidelines to enhance these anticipated positive impacts of the Industrial Park on the riparian reserve.

c) Potential Negative Impacts, Significance and Mitigation

Observations in other areas have shown that where industries are constructed next to a riparian area, low-income workers tend to build informal houses on the riparian reserve. With no clear guidelines, this is likely to happen even for this Industrial Park. This will lead to loss of riparian vegetation, and aesthetics. The water in the stream is also likely to be polluted with untreated or partially treated industrial wastewater. This can affect both the riparian vegetation and the aquatic flora and fauna both at the immediate environment and downstream.

Some of the design and management interventions the park has employed to prevent Cherunya stream from being polluted includes observing the 30m riparian reserve, creation of activity nodes to attract users into the riparian reserve park for activities such as picnics, hiking, jogging, cycling and bird watching - *see table 30 and figure 19*.

Without mitigation, the impact of implementing the Industrial Park Master Plan on the riparian reserve would be significant as illustrated by an environmental risk factor of 105 – *see table 31*. However, with mitigation, the environmental risk factor drops to 11 – *see table 32*. This suggests that if mitigation is effectively implemented, the negative impact on the environment will be minimal and insignificant.

Table 30: Riparian Zone Management Guidelines and Regulations

Activity	Regulations
a) Access	<ul style="list-style-type: none"> • The riparian reserve will be accessible by all members of the public to utilize between 8.00am and 6.00pm daily • Management may close the reserve to the public for maintenance or other reason they deem necessary • Motor vehicles will not be permitted within the riparian reserve except for emergency cases only • Pedestrian, wheel chairs and cycling are the permissible forms of movement within the riparian reserve
b) Recreation	<ul style="list-style-type: none"> • The park may be utilized for passive recreation activities such as picnics, hiking, bird watching, and strolling • Recreational activities that utilize the natural setting of the reserve/park such as jogging, cycling shall be allowed within the park • Active sports and other activities that will require clearing of vegetation will not be permissible within the park
c) Development	<ul style="list-style-type: none"> • Development of permanent structures shall not be permitted within the riparian reserve • Shelters and any other structures necessary within the riparian reserve shall be made of natural degradable materials
d) Planting	<ul style="list-style-type: none"> • The reserve shall be planted with indigenous plant species to create an arboretum along the riparian reserve • Exotic vegetation species should be avoided, • Invasive vegetation species should be avoided
e) Storm water	<ul style="list-style-type: none"> • The storm water from the surrounding areas shall be relayed to the stream through bio-swales and natural channels • The riparian reserve shall be planted with ground covers to reduce and filter storm water before it gets into the river channel, reduce erosion and sedimentation in the channel
f) Economic activity	<ul style="list-style-type: none"> • Economic activities such as hawking, shops are not permissible within the riparian reserve
g) Education	<ul style="list-style-type: none"> • Groups or individuals can access the reserve for educational purposes so long as they obtain permission from the management
h) Human safety and comfort	<ul style="list-style-type: none"> • Comfort and convenience facilities such as washrooms, seats, drinking fountains and shelters shall be provided within the riparian reserve • Development of the reserve into a park will be based on CPTED principles to promote security and safety

Table 31: ERF Without Mitigation

Negative impacts	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Slum emergence	2	5	5	5	1	3	54
Water pollution	2	4	5	5	1	3	51
Total	4	9	10	10	2	-	105

Table 32: ERF With Mitigation

Negative impacts	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Possible slum emergence	2	1	1	1	1	1	6
Water pollution	1	1	1	1	1	1	5
Total	3	2	2	2	2	-	11

Figure 19: Cherunya Steam Riparian Reserve Plan



9.3.4: Impacts on Biodiversity

Profile

Biodiversity boosts ecosystem productivity where each species, no matter how small, all have an important role to play.

Potential Positive Impacts

There will be deliberate increase in vegetation species to increase vegetation diversity in the park.

Potential Negative Impacts, Significance and Mitigation

Clearance of vegetation to pave way for construction for the proposed project will destroy the plants and microorganism’s ecosystems. Approximately 10.4 acres’ green belt has been provided within the site. The green space is divided into the upper and lower segments by a road that cuts across the site. The upper segment has been designed for passive recreation while the lower segment has been designed to take a naturalistic character, planted with indigenous tree species to create an arboretum/botanical garden.

Apart from safeguarding environmental (biodiversity) quality, greenery and open spaces provided within the park are meant to enhance recreational needs of local dwellers, promote physical and mental health benefits through provision of jogging trails and bicycle trails, ameliorating local climate, improving air quality and promoting social cohesion and interaction.

Therefore, with mitigation, the environmental risk factor will drop by 91.7% from 60 to 5. The Master plan has provided for mitigation measures that could enhance the vegetative bio-diversity of the site beyond the current baseline status. See the table 33 and 34 below.

Table 33: ERF of Bio-diversity Without Mitigation

Negative impacts	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Clearance of all the vegetation	1	5	1	1	4	5	60

Table 34: ERF of Bio-diversity With Mitigation

Negative impacts	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Clearance of vegetation	1	1	1	1	1	1	5

Figure 20: Greenery and Open Space Plan



9.3.5: Impacts on Air Quality

Profile

Globally, concerns on air pollution caused by industries have been rising over time due to increased industrialization and the effects on the environment. Humanity is losing the battle for clean air despite decades of efforts to combat it; air pollution is taking a growing toll on human health, the environment, and the economy (WWI). About 2.4 million people die each year from causes directly attributed to air pollution. In Kenya, industrial air pollution continues to adversely affect human health and the environment. For example, occupational asthma, silicosis and asbestosis have been reported from industrial workers in battery manufacturing, cement production and mineral processing in Nairobi, Athi River, Thika and Mombasa towns (Kahenya, 1996). Kenya's potential to manage air quality has arguably improved with the passage of the Environmental Conservation and Management Act of 1999 and Air Quality Regulations, 2013 (Legal Notice No. 34).

Potential Positive Impacts

There is no major positive impact of implementing the industrial park master plan. Nonetheless, the mitigation measures proposed are likely to lead to improved air quality in the region and reduction in global warming gases.

Potential Negative Impacts, Significance and Mitigation

Air pollutants from the proposed industrial park will originate from the proposed light heavy industries such as the tanning, agricultural mechanization, agro and veterinary chemicals/drugs, wood industry, fertilizer processing and packaging industrial prototypes. These industries have the potential to generate harmful compounds such as carbon dioxide, carbon monoxide, formaldehyde, benzene, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter among others.

The Master Plan has proposed several strategies that are applicable in preventing and mitigating potential air pollution that include but not limited to:

- Effective enforcement of Legal Framework for air quality management in Kenya as provided for in EMCA 1999 (air quality regulations).
- Ensuring Air Quality Policy compliance by the actors such as industrialists, motorists and the general public.
- Conducting periodic air quality audits to determine trends in order to contain pollution dispersal and potential impacts.
- Advocacy for cleaner production measures and the use of green energy where possible.
- Use of vegetation to improve air quality. This strategy forms the major green belt theme that informed planning of the park. The green belt provided in addition to the proposed riparian management plan shall play a major role in promoting air quality. This is applicable by:
 - Direct removal of pollutants by absorbing gaseous pollutants through the leaf surface (CO₂, SO₂, NO₂) and Intercepting particulate matter on leaves (PM₁₀); Reducing air temperatures through shading and evapo-transpiration, and thereby lowering ozone levels (O₃).
 - Indirect means of reducing air-conditioning use and related energy consumption in buildings (through shading of buildings, air temperature reduction and wind modification) leading to lower air pollutants emissions from power plants (known as 'avoided emissions').

The environmental risk factor for this proposed park is significant just as any other industrial development elsewhere. The impact is nonetheless expected not to be serious due to the fact that this park will only accommodate light industrial activities, which do not lead to heavy industrial emission. We also note that the land is currently undeveloped hence a challenge in accurately estimating the actual magnitude of air pollution from the proposed industrial activities; thus, the recommendation to periodically monitor air quality. Table 35 illustrates the environmental risk factor.

Table 35: ERF of Air Pollution Without and With Mitigation

	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Without mitigation	3	5	5	5	5	5	115
With mitigation	1	1	1	1	2	1	6

9.3.6: Solid Waste Management

Profile

Globally, the total amount of waste generated annually worldwide (municipal, industrial, hazardous) is more than 4 billion tons. Industrial solid waste makes up to half of the total amount of waste that the world generates each and every year. The global value of the waste industry is estimated in US\$433 billion annually. Even though over 30% of waste is recycled every year, only 2% of the total industrial waste that is produced can be recycled (International Solid Waste Association). In Kenya, the primary high-volume generators of industrial solid wastes include the chemical, petroleum, metals, wood, paper, leather, textile and transportation industries. Secondary smaller generators include auto and equipment repair shops, electroplaters, construction firms, dry cleaners and pesticide applicators.

Potential Positive Impacts

The proposed project has the potential to generate waste in the rate of 1.42lb/100sq. ft./day. This translates into about 0.00639kg/sq. ft. /day. Assuming the total industrial and non-industrial potential of waste generation to be 90 acres, and the plot coverage of 75%, then the estimate will be 0.00639 x 2467800/day. The anticipated daily waste generation will therefore be 15 metric tons translating to 4900 metric tons annually. About 80% of the 4900 metric tons of solid waste can be re-used or recycled. Its processing and management will also create jobs. The benefits of industrial waste management include improving economic efficiency through the means of more efficient use of resources, reducing the adverse effect on environment through recycling and reusing the resources.

Potential Negative Impacts, Significance and Mitigation

If not well managed, the solid waste can be a nuisance, eye sore and health risk for the workers and the public. To mitigate this impact, a dual solid waste management system involving management initiatives from both individual industries and centrally under the stewardship of ICDC park administrator has been proposed. Within each industry, waste sorting, reduction, reusing and recycling shall occur. In the long run, and specifically when the park attains an operational capacity of 60%, an industrial biogas plant shall be established. This approach is economical on land demand besides having other advantages ranging from cogeneration of energy, organic solid waste management, wastewater management, and does not pollute the environment as compared to typical waste management approaches like transfer stations and landfills.

The industrial biogas plant facility can be developed either by ICDC or a partnership with relevant stakeholders like ELDOWAS. ICDC could also interest a private investor especially those in the renewable energy sector. Preliminary estimates show that the park can generate 30% of its total energy needs from the waste biomass. Based on engineering calculations, the park needs about 20 metric tons per day to generate this energy. From the projections of anticipated waste, when in full capacity, the park will generate about 15 metric tons and shall need only 5 metric tons from external sources. As a result, the facility will aid in revenue generation by selling the energy to industrial

park investors at a favorable rate.

Overall, without mitigation, the environmental risk factor (ERF) will be high estimated at 180 with solid waste generation and smoke from incinerator having the same ranking of ERF of 90. With mitigation, the ERF will drop by 69% from 180 to 56. Suggesting that despite the mitigation, there will still be a significant residual negative impact. Sufficient attention should be given to the management of the smoke and the inorganic waste.

Negative impacts	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Solid waste generation	1	1	1	1	1	1	5
Smoke from incinerator	2	2	5	5	3	3	51
Total	3	3	6	6	4	-	56

Table 36: ERF Without Mitigation

Negative impacts	Coverage	Magnitude	Duration	Frequency	Reversibility	Probability (ERF)
Solid waste	1	5	5	5	2	90
Smoke from incinerator	2	3	5	5	3	90
Total	3	8	10	10	5	180

Table 37: ERF with Mitigation

9.3.7: Impacts on Transport Systems

Profile

Efficient transport is a critical component of economic development, globally and nationally. Transport availability affects global development patterns and can be a boost or a barrier to economic growth within individual nations. Transportation investments link factors of production together in a web of relationships between producers and consumers to create a more efficient division of production, leverage geographical comparative advantage, and provide the means to expand economies of scale and scope.

Potential Positive Impacts

The proposed industrial park is strategically located among major transport infrastructure such as the Eldoret International Airport, the northern economic transport

corridor as well as the planned standard gauge railway. Through these networks multiple benefits anticipated include reduced cost of transportation of raw materials and finished products, thereby making it an attractive investment destination, ease trucks congestion within the Park hence making roads safer for human traffic and protection of the environment through reduced carbon emission. The park will also lead to increased employment and business in the transport sector.

Potential Negative Impacts, Significance and Mitigation

The projected modes of traffic likely to access the industrial park include: passenger vehicles; delivery/collection vehicles – both heavy and light commercial vehicles; service vehicles; taxis; emergency vehicles; pedestrians; and heavy commercial industrial traffic. These will have implications such as Increased traffic volume on Eldoret-Kisumu road and the general neighborhood of the Industrial Park, increased traffic jam, time loss; Increased noise and vibrations particularly of heavy commercial/industrial traffic; Increased demand for petroleum fuel; and Increased pollution emission from the vehicles

To reduce on noise and vibration nuisance, heavy commercial vehicles will access the park through the northern entrance and exit the park through the same. In particular, the residential properties on the eastern side of the park will be protected from such excessive noise and vibrations from industrial traffic given that the road is not in close proximity to the residential estates. To ease congestion along main roads within Uasin Gishu county, it is proposed that trucks ferrying raw materials to the proposed park will supply goods at night and with an efficient logistical system it will reduce load clearance time and costs of production.

An efficient logistical system reduces load clearance time and costs of production. The main mode of transport within the Industrial park will be road based. Given the varied types of traffic anticipated within the project area, a central transport surveillance office has been proposed. The main objective of the office shall be to monitor the efficiency of transportation within the park and develop sustainable management measures. This will ensure efficient transportation, time and vehicle operation cost reductions that will increase profitability for the transporters. This is proposed to be at the main entrance, which is situated on the northern boundary of the Park. This will ensure that all logistics can be controlled before they can enter the site.

Light vehicles that are non-industrial have been proposed to enter and exit the park via both entrances but will be highly encouraged to use the southern entry/exit. Traffic using the southern entry/exit will transition from the Eldoret-Kisumu Road to join the Industrial Park through the KURA -1 access road at the southern part of the park. The control of traffic on this road will also help minimize traffic related impacts in the residential

neighborhood where it passes. Traffic signs should be erected to discourage truck-related traffic within this road. A careful consideration of both the positive and negative impacts of the proposed master plan on transportation shows an environmental risk factor of 395. With mitigation, this factor will reduce by 61.1%. See table 38 and 39.

Table 38: ERF for Traffic Without Mitigation

Negative impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased traffic volume	4	3	5	5	4	5	105
Increased noise and vibrations	4	2	5	5	4	5	100
Increased demand for petroleum fuel	1	2	5	5	4	5	85
Increased pollution emission	4	3	5	5	4	5	105
Total							395

Table 39: ERF for Traffic Without Mitigation

Negative impacts	Geographic Coverage	Magnitude	Duration	Frequency	Reversibility	Probability	ERF
Increased traffic volume	4	2	3	3	2	3	42
Increased noise and vibrations	4	2	2	4	3	2	30
Increased demand for petroleum fuel	1	2	2	2	3	4	40
Increased pollution emission	3	2	3	4	2	3	42
Total							154

9.4: CHAPTER CONCLUSION

Industrial and technological development can lead to enormous advantages for economy and society, but it can also result in awkward trade-offs, often in manufacturing and in three main dimensions: economic vs. social, social vs. environmental and environmental vs. economic. Understanding these trade-offs is a precondition for developing the right complementary strategies. To achieve gains on all three dimensions, integrative approaches are needed, which consider the full range of positive and negative consequences of innovation and promote interactions between all actors and sectors of the economy.

Kenya has a set of policy provisions towards resource creation and use with an aim of achieving sustainability. There exist policies that prescribe accepted activities that affect land, environment and natural resources. A lot of policies that determine the management of land are present in the country, with the Constitution of Kenya (2010) being key. Some of the sections in the Constitution on land and land-based resources include Articles 60, 66, 69 and 260 among others. Besides the constitution, there exist other policy and legislative provisions. The master plan has integrated these legal provisions amongst other innovative approaches to propose the mitigation strategies suggested above.

CHAPTER TEN

STRATEGIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

10.1: OVERVIEW

A Strategic Environmental and Social Management Plan is prepared to show how site specific concerns and mitigation measures are addressed through planning/design, construction and operation phases of a project/plan. It provides a link between the impacts of project activities and the mitigation measures put in place to minimize these impacts and enhance the positive impacts. These actions are necessary in order to: (1) Minimize the negative impacts which might originate from the plan implementation and instead enhance the positive impacts of the EIMP Masterplan; and (2) Support the long-term management and monitoring of the environmental issues during plan implementation.

In this SEA report, most of the proposed plan interventions are at broader level and this SESMP is only envisaged to provide strategic guidelines for the subsequent project specific SESMPs based on detailed component designs, construction and operation plans. These will be formulated from project and site specific environmental and social impact assessments which will be undertaken before implementation of the various specific project commences. This SESMP prescribes and directs the management of all environmental aspects of the EIMP Master Plan including the physical, natural and social impacts, associated with and arising from planning, construction, and operation of the proposed components of the Master plan.

10.2: INSTITUTIONAL ROLES AND RESPONSIBILITY

For effective implementation of the proposed project, it is a necessary to identify the relevant institutions, agencies, authorities or persons and their respective roles in the process. Thus, the following identified entities ought to be involved in the implementation of the SESMP throughout the project cycle or as deemed fit.

For environmental sustainability of the park, there is need for close and committed monitoring of all the activities. The study therefore proposes that ICDC establishes an Environmental Management Unit (EMU) to take responsibility of overseeing the implementation activities. Such a unit can be run by a team of three officers consisting of an Environmental Manager and two assistants. Their main responsibilities will be to understand the environmental requirements of the park, ensure full implementation of the recommended actions, monitor the performance of the environment, ensure compliance by all agencies, generate and keep records of the trends and write reports. The unit personnel will be expected to understand all the environmental laws and by-laws relevant to implementation of the SESMP and all the equipment required to monitor environmental parameters using the appropriate indicators.

Secondly, the unit will be expected to liaise with the departments responsible for environmental matters at the Uasin Gishu County Office, national government agencies and the implementing agencies to ensure effective implementation of the SESMP. Key

implementing agencies include Kenya Power, Communication Authority of Kenya, WRMA, ELDOWAS, Kenya Pipeline Corporation and Kenya Urban Roads Authority.

The National Environment Management Authority (NEMA) is the key institution of the government overseeing implementation of environmental policy and laws in Kenya. The authority will take responsibility for general supervision and coordination of all environmental matters. In addition to reviewing environmental reports on the progress of EIIP Master Plan, the authority's inspectors may visit any of the projects, during implementation, make reports and suggest improvements to ensure compliance to the recommended quality standards. The cost of implementing and maintaining environmental quality of the park and its surrounding is estimated at Ksh. 10 million per year. A way of generating the funds from the park investors should be explored to ensure sustainability. This includes measures such as environmental levies paid by all the industries and businesses in the park using agreed criteria e.g. per sq. Metre occupied. The institutional arrangement for implementing the EIIP master plan is summarized in Table 40 below:

Table 40: Institutional Arrangements of Implementing Environmental Components of the Master Plan

INSTITUTIONS	KEY RESPONSIBILITIES
ICDC EIIP Administrator Environment Management Unit (EMU)	-ICDC to participate in the entire SEMP process as part of the owner. -EMU to oversee implementation of the environmental requirements of the EIIP Master Plan as conducted by contractors/investors from construction, reviewing and verifying the implementation of the ESMP of the Park
Uasin Gishu County Government (All relevant departments and ministries)	-Provide oversight and advisory services during the implementation of activities of their respective sectors by volunteering information if need be.
NATIONAL GOVERNMENT	
Ministry of Industrialization and Enterprise Development	-Policy direction on industries and trade -Provide funding, -Facilitate in coordination of trade and associated matters
Ministry of Agriculture, Livestock and Fisheries Development Ministry of Environment and Natural Resources	-Training and mobilization of farmers for raw materials production -Farm level value addition -Forestry Policy Advice
Ministry of Lands, Housing and Urban Development	-Addressing land and land tenure Issues of the park -Approval of land use plans for industries -Approval of architectural drawings -Initiating, developing and implementing residential housing projects in the parks neighbourhood.
IMPLEMENTING AGENCIES	
Kenya Urban Roads Authority	-Overseeing construction of the roads, foot paths, storm water drainage in the Industrial Park.
Eldoret Water and Sanitation Co. Ltd. (ELDOWAS)	-Supply of clean water to the Park -Providing sewer services to the Park -Regular monitoring of sewer quality at the park before draining into the public sewer. -Potential company for solid waste collection.
Kenya Forest Service	-Training and mobilizing farmers to produce tree and bamboo seedlings, plant trees and bamboo for supply of forestry based raw materials to the industries.

	-Building capacity of the Community Forest Associations to coordinate tree growing activities in the county for raw materials supply.
Kerio Valley Water Service Board	Efficient and sustainable water supply management.
Kenya Power	Supply of electricity and provide maintenance services.
Kenya Railway Corporation	Possible extension of railway line to the park.
Rift Valley Railway Corporation	Provision of railway line services for goods, people etc.
National Construction Authority	Monitoring construction works for quality control.
Water Resources Management Authority	-Monitoring of water abstraction rates. -Monitoring of water quality - pollution of water sources – rivers and boreholes.
National Environment Management Authority	-Review Environmental Impact Assessment (EIA) reports for the different investors/projects -Review environmental audit (EA) reports. -Approve EIA and EA reports. -Deal with cases of non-compliance.
Eldoret University Moi University Eldoret Polytechnic Other Academic Institutions	-Facilitate capacity building of young entrepreneurs. -Facilitate incubation of innovations.
Kenya Industrial Research and Development Institute (KIRDI)	Facilitating industrial technology development and transfer.
Kenya Bureau of Standards	Monitor product standards.
Kenya Institute of Intellectual Property (KIPI)	Patenting of innovations.
Kenya Association of Manufacturers (KAM)	-Energy use audits to monitor energy efficiency. -Water use audits to monitor water efficiency. -Ensure welfare of the Industrialists.
Investors	-Construct and invest according to the laid down development and environmental guidelines and regulations. -Comply with county, national and international quality standards.

10.3: STRATEGIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

In this SEA report, most of the proposed plan interventions are at broader level and this SESMP is only envisaged to provide strategic guidelines for the subsequent project specific SESMPs based on detailed component designs, construction and operation plans. These will be formulated from project and site specific environmental and social impact assessments which will be undertaken before implementation of the various specific project commences. This SESMP prescribes and directs the management of all environmental aspects of the EIIP Master Plan including social- economical, physical, natural and environmental impacts - see table 41 below.

Table 41: Strategic Environmental and Social Management Plan

STRATEGIC IMPACTS	OBJECTIVES AND TARGETS	STRATEGIES AND MANAGEMENT PLAN	PROJECT PHASE	INSTITUTIONAL RESPONSIBILITY
ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT PLAN				
1. LAND AND LAND USE	<ul style="list-style-type: none"> Compatibility and land use integration Legal compliance (Zoning guidelines) Balanced and self-sustaining in terms of operations and service provision. Pollution Control 	<ul style="list-style-type: none"> Integrate environmental concerns into regional and local development plans. Develop land use guidelines Promote appropriate land use practices Industrial Land use as per the Zoning guide Landscaping that employs green infrastructure Harmonization of policies Promoting conservation and protection of the underground water systems. Mixed-use approach as opposed to exclusive zoning Development Control Guidelines. Revise and implement the National Land Policy of 2009. 	Project life	ICDC project consultancy team
2. NATURAL RESOURCES (SOIL, LAND)	<ul style="list-style-type: none"> Effective rehabilitation of disturbed areas to restore ecological functioning Limit pollution of soils and water resources Resource use efficiency Transition to sustainable practices. 	<ul style="list-style-type: none"> Re-use excavated soil for landscaping along the pedestrian walkways, road reserve and parking areas. Indigenous tree species to create an arboretum/botanical garden. Enhance recreational needs of local dwellers. Enforce EMCA, 1999 and its subsidiary legislation and other relevant legislation. 	Construction Phase	All implementing agencies
3. BIODIVERSITY, ECOSYSTEMS AND NATURAL HABITATS	<ul style="list-style-type: none"> Rehabilitate all un-used areas after construction. Effective re-vegetation Minimal destruction of floral communities and ecosystem functioning Compliance with Convention on Biological Diversity (CBD). 	<ul style="list-style-type: none"> Develop and harmonize management strategies for trans-boundary forest resources. Implement River Cherunya riparian management plan. Implement and effectively maintain the 10.4 acres of green belt across the EIIP. Increased vegetation planting and rehabilitation Adopt economic incentives for management of forest products. Enforce existing legislations. 	Project Life	All implementing agencies

		<ul style="list-style-type: none"> ▪ Increase forest cover 		
4. AIR QUALITY	<ul style="list-style-type: none"> • Legal compliance • Limit dust emission resulting from vehicle entrained dust liberation • Minimize vehicle emissions 	<ul style="list-style-type: none"> ▪ Install emission control technologies ▪ Plant vegetation to improve air quality. ▪ Ensure Air Quality Policy compliance ▪ Advocacy for cleaner production technologies. ▪ Conduct periodic air quality audits. 	Construction and post construction	ICDC, NEMA
5. FORESTRY	<ul style="list-style-type: none"> • Increased forest cover • Management and sustainable utilization of forests • Valuation of ecosystem goods and services • Control and efficient management of fire outbreaks • Management of trans-boundary forests resources • Zoning of forests • Amelioration of climate change effects 	<ul style="list-style-type: none"> ▪ Ensure increased planting and rehabilitation of deforested areas. ▪ Implement and enforce the Forest Act 2005 and Draft policy ▪ Undertake research and enhance collaboration on the management of invasive species ▪ Adopt economic incentives for management of forest products. ▪ Research on efficient charcoal production technology ▪ Finalization and implementation of charcoal policy ▪ Build capacity on fire management ▪ Develop and harmonize management strategies for trans-boundary forests resources ▪ Enforce existing legislations ▪ Increase forest cover 	Post construction	All implementing agencies
6. WATER RESOURCES AND QUALITY	<ul style="list-style-type: none"> • Legal compliance • Appropriately respond to manage and minimize pollution in the event of a spill. 	<ul style="list-style-type: none"> • Implementation of soil and water conservation measures • Integrated sustainable water resource management through the 3Rs (Reduce, Reuse, Recycle) <ul style="list-style-type: none"> ▪ Combination of public pipe water and underground water. ▪ Enforce Water Act 2002 and other related legislations ▪ Provision for an on-site portable water treatment plant. ▪ Enhance regional cooperation in management of trans-boundary waters ▪ Re use and recycling of industrial waste water. ▪ Develop and implement appropriate compensation schemes for watershed ecosystem services. 	Project Life	ICDC, NEMA, WARMA, ELDOWAS
7. STORM WATER MANAGEMENT	<ul style="list-style-type: none"> • Reduction of excess run off. • Sustainable water conservation • Recycling of storm water • Increasing vegetation cover 	<ul style="list-style-type: none"> ▪ Environmentally sound management and sustainable use of wetlands; ▪ Roof catchment and re-use of rain water at plot level ▪ Use of porous paving in the open spaces 		

	<ul style="list-style-type: none"> • Conservation of water catchment areas • Sustainable drainage systems 	<ul style="list-style-type: none"> ▪ Use of bio-swales in places with suitable gradient; ▪ Use of retention ponds to promote percolation and recharging of the underground water table, ▪ Creating green roofs which slow surface run off. 		
8. ECOLOGICAL QUALITY	<ul style="list-style-type: none"> • Legal compliance • Preserve indigenous plant species and protect biodiversity • Re-establish floral habitat and ecosystem functioning 	<ul style="list-style-type: none"> ▪ Green belt across the park ▪ Enhance recreational needs of local dwellers, ▪ Promote physical and mental health benefits through provision of jogging trails and bicycle trails, ameliorating local climate, improving air quality and promoting social cohesion and interaction. 	Project Life	All implementing agencies
9. WETLAND	<ul style="list-style-type: none"> • Environmentally sound management and sustainable use of wetlands; • Identification, mapping and gazettement of wetlands • Control and management of invasive species • Reduction of siltation and pollution • Effectively apply EIA for developments that are likely to have impact on wetlands; • Enhance public awareness and management responsibilities 	<ul style="list-style-type: none"> ▪ Implement Wetlands Policy ▪ Inventorize wetlands resources ▪ Implement wetlands regulations and other relevant legislation ▪ Generation of accurate data and information ▪ Undertake research and enhance collaboration on the management of invasive species ▪ Enhance awareness and appreciation of wetlands 	Project Life	All implementing agencies
10. WASTE MANAGEMENT	<ul style="list-style-type: none"> • Legal compliance • Pollution control • Sustainable development. 	<ul style="list-style-type: none"> ▪ Trash enclosures for initial solid waste storage. ▪ Waste sorting, reduction, reusing and recycling ▪ Incineration ▪ Biogas plant technology. 	Project Life	All implementing agencies
11. CLIMATE CHANGE	<ul style="list-style-type: none"> • Climate change adaptation and disaster risk reduction • Limit the emission of greenhouse gases to the atmosphere • Conserve energy to limit the emission of greenhouse gases to 	<ul style="list-style-type: none"> • Increase of national budgetary allocation to climate change mitigation and adaptation • Environmental management institutional strengthening • Improving inter-sectoral coordination • Advocacy for cleaner production. • Strengthen early warning systems 	Project Life	All implementing agencies

	the atmosphere	<ul style="list-style-type: none"> ▪ Use of biomass energy ▪ Establish a green belt ▪ Energy cascading principle • Use of renewable energy sources. • Generation of energy from solid wastes. • Mainstreaming sustainable land management into national planning, policy and legal frameworks • Enhancing analysis and exchange of experiences on climate change mitigation and adaptation among stakeholders and policymakers • Undertake research on impact of climate change on environmental, social and economic sector 		
SOCIAL -ECONOMIC MANAGEMENT PLAN				
12. EMPLOYMENT AND JOB CREATION	<ul style="list-style-type: none"> • Equity and Equality • Legal compliance • 40,000 indirect employments • 15,000 direct employment • Sustain about 50,000 household heads. • Increase income/wage. • Better living standards. 	<ul style="list-style-type: none"> • 1 police post and 1 health centre within ICDC complex. ▪ Civic Education for workers. ▪ Enhance equity and wealth creation opportunities for all. ▪ Provides basic protections against discrimination based on age, race, religion, sexual orientation or gender identity in employment ▪ Creating an all-inclusive development where all members of society have a sense of belonging with the EIIP. 	Project Life	All implementing agencies
13. SOCIAL AMENITIES	<ul style="list-style-type: none"> • Avoid health impacts associated with pollution. • Legal compliance. • Public Health. 	<ul style="list-style-type: none"> • 1 health centre within ICDC complex. • A belt of green public open space designed to enhance recreational needs of local dwellers. • ICDC will invest in school's improvement initiatives. ▪ UG CIDP programs. • Key infrastructure and amenities that would be required will either be provided in the park or in collaboration with the existing agencies. 	Project Life	All implementing agencies

<p>14. AGRICULTURE {CROPS (COTTON, VEGETABLES, FRUITS ETC.), LIVESTOCK, FISHERIES AND FORESTRY}</p>	<ul style="list-style-type: none"> • Enhanced sustainable agriculture. • Adding value to agricultural produce/intermediates/residues, food and non-food. • Income generation • Employment creation • Food security • Increase demand for agriculture based raw materials. • Foreign exchange income earner • Farmer-Market linkage • Ksh.40 billion increase in national GDP. • Value Chain Benefits. 	<ul style="list-style-type: none"> • Innovative, commercially oriented and modern agriculture. • Integrate indigenous knowledge in crop production systems • Public-Private Partnerships (PPPs). • Transforming key institutions in agriculture and livestock. • A county and national agriculture land use master plans; • Control pollution from use agricultural inputs (pesticides and fertilizers) • Promotion of agroforestry. • UG CIDP programs • Improve crop/livestock production. • Increased productivity of crops and livestock through sustainable agriculture. • Improving market access • Development and commencement of the implementation of a 3-tiered fertilizer cost reduction programme. • Regulation on introduction of Genetically Modified Organisms (GMOs) • Develop and implement sustainable land use guidelines 	Project Life	All implementing agencies
<p>15. POPULATION INFLUX</p>	<ul style="list-style-type: none"> • Employment Opportunities • Labour (skilled and unskilled). • Market for processed products. • Cultural Integration. • Government Revenue 	<ul style="list-style-type: none"> • De-concentration of major developments at National level • Provision of key infrastructure and amenities. • Corporate Social Responsibility (CSR activities). ▪ Green park and a health facility 	Project Life	All implementing agencies
<p>16. SECURITY, SAFETY, FIRE EMERGENCY AND PREPAREDNESS</p>	<ul style="list-style-type: none"> • Occupational, Health and Safety compliance • Safe working conditions • Mitigate and manage environmental, health and safety risks • Appropriate preparedness and response to fires • Legal compliance 	<ul style="list-style-type: none"> ▪ Centralized break out spaces which are mainly the open spaces, green corridors within the park. ▪ Fire detectors within buildings. ▪ Buildings structural integrity ▪ Fire brigade access ▪ Park one (1) fire station ▪ Firefighting shafts ▪ Fire assembly points and Fire evacuation procedures ▪ External fire hydrants (FH) ▪ 1 police post 	Project Life	All implementing agencies

	<ul style="list-style-type: none"> • Safety and Security. 			
17. TRAFFIC DISRUPTION (TRAFFIC, NOISE AND VIBRATIONS)	<ul style="list-style-type: none"> • Reduced conflicts • Minimize traffic disruption • Legal compliance 	<ul style="list-style-type: none"> ▪ Controlled access. ▪ Distant proximity to other land uses. ▪ Parking model hybrid of on-site, centralized and on-street parking. 	Project Life	All implementing agencies
18. HOUSING AND SANITATION	<ul style="list-style-type: none"> • Real estate developments • Decent, affordable housing and related amenities. • Opportunity for Public-private sector partnership projects. (PPPs) 	<ul style="list-style-type: none"> • Housing development public-private partnerships (PPPs). • Sensitization of communities on the importance of health and sanitation • Facilitate UG CIDP housing programs. • Low cost decent housing provision. • Incentives to real estate developers. • Unlocking land supply • Reducing housing construction costs. • Improving operations and maintenance. ▪ Lowering financing costs for buyers and developers to guarantee decent and affordable housing for all. 	Post construction	Real estate developers, Uasin Gishu county, NACHU etc.
19. TRADE	<ul style="list-style-type: none"> • Intensify Clean Development Mechanism (CDM) • Enforcement of the urban by-laws and other relevant legislations • Enforcement of standards • Compliance to EIA/EA regulations 2003 • Regulation and management of toxic and hazardous chemicals • Control trade in invasive and endangered species • Control of noise and air pollution • Application of economic instruments (incentives and disincentives) in trade on environmental friendly technologies 	<ul style="list-style-type: none"> ▪ Proper management of solid and liquid waste ▪ Adoption of Clean Development Mechanism (CDM) ▪ Enforce the by-laws and other relevant legislations on planning for location of markets ▪ Educate the public and control use of counterfeit goods ▪ Finalize and implement regulation on toxic and hazardous chemicals ▪ Develop a policy on trade in invasive and endangered species ▪ Finalize and implement regulation on noise pollution ▪ Develop and implement economic instruments for environmental management 		

20. INDUSTRY	<ul style="list-style-type: none"> • Management of solid and liquid waste • Enforcement of standardized technologies • Regulation and management of toxic and hazardous chemicals • Control of noise and air pollution • Adoption of cleaner production technologies • Compliance to EMCA, 1999, relevant legislations and policies • Effective implementation Physical Planning Act 1996 • One stop shop for all licenses by the relevant institutions 	<ul style="list-style-type: none"> ▪ Enhance use of cleaner production systems ▪ Enforce and implement standardized technologies ▪ Finalize and implement regulation on toxic and hazardous chemicals ▪ Finalize and implement regulation on noise pollution ▪ Enforce EMCA, 1999, relevant legislations and policies ▪ Enforce Physical Planning Act 1996 ▪ Develop a one stop shop for all licences by the relevant institutions 		
21. FOODSERVICE AND FOOD RETAIL INDUSTRIES	<ul style="list-style-type: none"> • Sustainable energy consumption • Management of solid and liquid waste • Compliance with Public Health Act • Compliance with occupational Health and Safety Regulation, 2007 • Control of air emissions • Compliance to EIA/EA Regulations 	<ul style="list-style-type: none"> ▪ Enforcement of EMCA, 1999 its subsidiary legislations ▪ Enforcement of Public Health Act ▪ Enforcement of Occupational Health and Safety Regulation, 2007 ▪ Promotion of alternative and sustainable energy consumption technologies 	Project life	ICDC, NEMA, County government
INFRASTRUCTURE MANAGEMENT PLAN				
22. INFRASTRUCTURE	<ul style="list-style-type: none"> • Provision of Quality sustainable eco infrastructure • Legal compliance • Averting land degradation • Controlling air and water pollution 	<ul style="list-style-type: none"> ▪ Integration of environmental concerns into projects, programmes and activities. ▪ Enforce regulations ▪ Promote cleaner production technologies ▪ Rehabilitation of degraded areas ▪ Control and mitigation of radiation emissions 	Project Life	ICDC and All implementing agencies

	<ul style="list-style-type: none"> • Preventing loss of biodiversity • Maintenance of aesthetic values • Solid and liquid waste management. 	<ul style="list-style-type: none"> ▪ Encourage public private partnership ▪ Encourage use of appropriate building technologies and materials ▪ Improvement of sanitary accommodation and hygiene promotion. 		
23. TRANSPORT (ROAD)	<ul style="list-style-type: none"> • Legal compliance • Road users' safety. • Control of air and noise pollution • Compliance to EMCA, 1999 and its subsidiary regulations 	<ul style="list-style-type: none"> ▪ Separate motorized transport and non-motorized transport lanes. ▪ A minimum of 1.5 m pedestrian trail. ▪ Safe, defined, clearly marked and convenient pedestrian walkways and cycle lanes. ▪ implementation of Air Quality Regulations, Noise and Excessive Vibration Regulations 2007 ▪ Enforcement of EMCA, 1999 and its subsidiary regulations 	Project Life	All implementing agencies
24. ENERGY SUPPLY	<ul style="list-style-type: none"> • Clean sustainable energy. • Energy conservation • Diversification of energy sources • Technological and financial resources. • Provision of clean energy • Pollution control • Sustainable natural resource use • Enforcement of legislations • Promotion of private production and distribution of energy 	<ul style="list-style-type: none"> ▪ Incorporating solar infrastructure within the roofs of all the industries. ▪ Use of biomass energy • Passive Industrial design and Energy cascading principle ▪ Promotion of private production and distribution of energy ▪ Capacity building ▪ Provide incentives for energy production. ▪ Promote integrated energy planning that incorporates energy and land use concerns ▪ Promote energy conserving technologies and diversification of energy sources. ▪ Enhance partnership and promote privatization of energy utilities 	Project Life	ICDC, Kenya Power
25. ICT	<ul style="list-style-type: none"> • Control of radiations • Management of E-waste • Management of solid waste • Compliance to EIA/EA Regulations • Occupation Health and safety policy in place 	<ul style="list-style-type: none"> ▪ Enforcement of Radiations regulations ▪ Develop and implement E-waste Management regulations ▪ Enforcement of EIA/EA Regulations, 2003 and Waste Management Regulation, 2006 		

GOVERNANCE AND INSTITUTIONAL FRAMEWORK MANAGEMENT PLAN				
<p>26. GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS</p>	<ul style="list-style-type: none"> • Good governance • Organizational commitment and integrity. • Adequate capacity to interpret and enforce environmental legislations. • Harmonize environmental legislations and institutional mandates. • Incorporation of community pre-existing rights in natural resource utilization. • Acceptance to pay for ecosystem services and goods • Devolve court systems up to the village council level and local environmental courts to help in fast tracking environmental decisions/cases. • Devolve funds for environment management 	<ul style="list-style-type: none"> ▪ ICDC Complex Management block ▪ ICDC Environmental Management Unit ▪ Build capacity to domesticate MEAs ▪ Institutionalize democratic, transparent, accountable and enforceable environmental management rules and regulations ▪ Synergies in institutional partnership. ▪ Institutionalize participatory, consultative and community inclusive environment management. ▪ Review National sectoral and transboundary environmental laws to ensure harmony in natural resource management. ▪ Build capacity to promote sustainable utilization of natural resources. ▪ Use of incentives to promote compliance ▪ Incorporate transboundary environmental management into existing environmental laws. ▪ Enhance enforcement of EMCA, 1999 and other legislations for natural resource utilization. ▪ Valuation of ecosystem services and goods in monetary terms ▪ Devolvement of funds with specific percentage for environment management. 	<p>Project Life</p>	<p>ICDC and All implementing agencies</p>

CHAPTER ELEVEN IMPLEMENTATION, MONITORING AND EVALUATION MANAGEMENT PLANS

11.1: OVERVIEW

This chapter presents the approach towards implementation, monitoring and evaluation management plans for the implementation process of the proposed project. The objective of the implementation, monitoring and evaluation management plan is to strategically integrate environmental concerns in the proposed development planning and implementation.

11.2: STAKEHOLDER INVOLVEMENT

As identified in the previous chapter, the implementation, monitoring and evaluation management plan will involve communities, civil society, private sector, learning institutions, government, policy makers and development partners. The engagement of stakeholders in the implementation process will be guided by their statutory mandate, their capacities and priorities. The recently formulated Public Private Partnership strategy sets the framework for private sector involvement. Stakeholders will be involved at all stages of project preparation and implementation including monitoring and evaluation. Measures will also be explored to enable donors finance various projects.

11.3: RESOURCE REQUIREMENT

Implementation of the Environmental and social economic Action Plans for the proposed project requires a deliberate and targeted allocation of resources (financial, human, and technological) that calls for resources capacity assessment. The impacts from various interventions in integration of environmental concerns often take time to be realized hence the need for prioritization as resources for allocation are usually scarce. Potential sources of funding should include ICDC fund kitty, locally available resources as well as County Allocation Funds; Constituency Development Fund; Government Budgetary allocations; support from NGOs; CBOs; religious organization, private sector and development partners.

11.4: IMPLEMENTATION

Implementation of the planning and design provisions outlined in this industrial master plan has been envisioned under two fundamental phases – construction phase and post-construction phase. It is also important to note that there are some implementation processes that will commence before mainly touching on statutory approval logistics.

Construction Phase will involve construction works including trunk infrastructure, ICDC administration complex and individual industries by various investors. ICDC being the

developer, will undertake construction of capital works which include; roads, storm water drainage system, water reticulation system, sewerage system, central effluent treatment plant, power sub-station, electrical supply system, ICT, landscaping of the green belt among others. These works will take approximately 3 years.

For ease of execution, construction of the capital works will be done in 2 phases aligned to the two main blocks constituting the industrial park. The first phase of construction will mainly cover works within the North-Eastern bloc. On the other hand, the second phase will mainly involve construction of; ICDC complex, gas/steam supply system and the remaining 40% capital works which all fall on the North West and Southwest side. Upon completion of the capital works by ICDC, the park will now be ready for individual developers to commence construction of their industries.

At the post-construction phase, ICDC shall designate an Industrial Park Administrator to take responsibility of management. The total amount of finances required to develop the master plan has been arrived at through estimation of the various components of the infrastructure broadly categorized under; core trunk Infrastructure, ICDC Complex, and Industrial infrastructure. The feasibility study report carried out for the Industrial Park in the year 2014 by Ernst and Young outlines in detail the various options available to the client for financing the project.

11.5: MONITORING AND EVALUATION

The purpose of monitoring and evaluation is to ensure their effective and efficient implementation as well as ensuring that Environmental concerns are addressed and integrated in the development process.

Monitoring is a never-ending process that continues throughout the life of a project. Monitoring and evaluation of this project will be carried out at specific time intervals in order to keep track of the steps in the development process and also to monitor the public's reaction and reception of the provided information. During the construction phase, the project manager will carry out periodic monitoring and evaluation based on the scope of works. After handover to ICDC, the Park Administrator will take over the role of continuous monitoring and evaluation to ensure that the standards of development as proposed in the master plan are adhered to.

The potential implementation, monitoring and evaluation management plan for the proposed ICDC industrial park is presented in the table 42 below:

Table 42: Monitoring and Evaluation Management Plan

SECTOR	OBJECTIVES	MONITORING INDICATORS	MEANS OF EVALUATION	REPORTING SCHEDULE	LEAD INSTITUTIONS FOR M&E
ENVIRONMENT AND NATURAL RESOURCES MONITORING AND EVALUATION STRATEGY					
LAND AND LAND USE	1. Promote appropriate land use practices	<ul style="list-style-type: none"> • Appropriate land use practiced • DC control guidelines compliance • No. of EIAs for individual industrial prototypes approved by NEMA. • Land degradation incidences 	<ul style="list-style-type: none"> • Land use plans • Development control Manual • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, NEMA, County government
WATER AND WATER RESOURCES	<ol style="list-style-type: none"> 1. Protection of water catchments and control of siltation 2. Water pollution control 3. Enhanced compliance on the water quality regulations 	<ul style="list-style-type: none"> • Water resource availability • Per capita water consumption (efficiency) • Length of river bank protected • Inventory and mapping of all significant point sources of pollution • Environmental (ambient) Water Quality Standards • No of Inspection of pollution sources • No. of discharge licenses issued by ELDOWAS. 	<ul style="list-style-type: none"> • Reports • ELDOWAS discharge licenses • Water Quality Standards 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, NEMA, County government, WRMA
AIR	1. Control Air pollution	<ul style="list-style-type: none"> • Air Quality Levels 	<ul style="list-style-type: none"> • Air audit reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, NEMA, County government
FOREST	<ol style="list-style-type: none"> 1. Afforestation and re-afforestation 2. Sustainable management of forest resources 	<ul style="list-style-type: none"> • No. of trees planted. • Tree cover % 	<ul style="list-style-type: none"> • Status reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, NEMA, County government
WETLAND	<ol style="list-style-type: none"> 1. To control pollution 2. Control wetland encroachment 	<ul style="list-style-type: none"> • No of cases reported and prosecuted. • Area of wetland protected 	<ul style="list-style-type: none"> • Monitoring Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, NEMA, County government, WRMA
CLIMATE CHANGE	1. To mitigate climate change	<ul style="list-style-type: none"> • Greenhouse gas levels • % increase in tree cover 	<ul style="list-style-type: none"> • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, KIRDI, County government, KFS,

		<ul style="list-style-type: none"> No. of Clean development projects No. of adoption of appropriate technologies No. of research findings on CC 			NEMA, Research Institutions
SOCIO-ECONOMIC IMPACTS MONITORING AND EVALUATION STRATEGY					
AGRICULTURE	1. Promote sustainable agricultural production.	<ul style="list-style-type: none"> No. of appropriate water harvesting technologies developed No. of efficient irrigation methods developed No. of drought tolerant crops adopted by local communities No. of awareness and education programmes initiated on safe use of agrochemicals 	<ul style="list-style-type: none"> A status report 	<ul style="list-style-type: none"> Annual 	<ul style="list-style-type: none"> ICDC, National and County governments, Line Ministries, Research and Educational Institutions, NGOs and relevant agencies
EMPLOYMENT	1. Promote inclusive employment 2. Gender equity in employment	<ul style="list-style-type: none"> No. of persons employed Ratio of men to women in employment No. of persons with disability engaged in park activities. 	<ul style="list-style-type: none"> A status report 	<ul style="list-style-type: none"> Annual 	<ul style="list-style-type: none"> ICDC, National, County Government and relevant agencies
WASTE MANAGEMENT	1. Improve access to clean water and Sanitation 2. Control of unplanned settlement along riparian reserve 3. Provision of adequate sanitation facilities 4. Control of pollution	<ul style="list-style-type: none"> No. of incineration facilities in place No. of waste and effluent discharge licence issued No. of awareness programmes in place No. of cases reported and prosecuted No. of waste recycling activities in place 	<ul style="list-style-type: none"> Status and Inventory reports 	<ul style="list-style-type: none"> Annual 	<ul style="list-style-type: none"> County Government and relevant agencies
TRADE	1. To minimize solid and liquid waste generation 2. To enhance and promote exportation of fresh agricultural	<ul style="list-style-type: none"> No. of treatment plants constructed No. of licenses issued to proponents under Waste, Air and Noise Pollution Control Regulations. Types and No. of appropriate technologies in production, processing 	<ul style="list-style-type: none"> Monitoring reports 	<ul style="list-style-type: none"> Annual 	<ul style="list-style-type: none"> ICDC, NEMA, ELDOWAS, WRMA County government

	<p>products.</p> <ol style="list-style-type: none"> 3. To ensure conformity with standards 4. To minimize air and noise pollution. 5. To ensure proper environmental management by use of economic instruments 	<p>and transportation promoted</p> <ul style="list-style-type: none"> • No. of programmes initiated to promote use of economic instruments 			
INDUSTRY	<ol style="list-style-type: none"> 1. To minimize solid and liquid waste generation 2. Adoption of appropriate technology 3. To ensure compliance to OHS measures 4. Compliance to EIA/EA regulations 	<ul style="list-style-type: none"> • No. incinerators constructed • No. of trash enclosures distributed • Quantity of solid waste disposed in land fills • No. of treatment plants constructed • No. of awareness programmes on appropriate technology initiated • No. of OHS compliant certificates awarded • No. of awareness programmes on OHS initiated • No. of EIA licenses issued and EA letters of compliance. • No. of offenders prosecuted EIA/EA compliance 	<ul style="list-style-type: none"> • Records and Annual reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, NEMA, ELDOWAS, WRMA County government
PUBLIC HEALTH	<ol style="list-style-type: none"> 1. To minimize air and noise pollution. 2. To minimize liquid and solid wastes generation 3. To ensure compliance to EIA/EA regulations 	<ul style="list-style-type: none"> • No. of air quality monitoring systems set up • No. of cases reported. • Long term illnesses of Industrial Park Community • Rate of use of recreation facilities. 	<ul style="list-style-type: none"> • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC and county government
FOOD SERVICE AND	<ol style="list-style-type: none"> 1. To ensure proper management of liquid 	<ul style="list-style-type: none"> • No. of cases reported 	<ul style="list-style-type: none"> • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC and county government

WHOLESALE AND RETAIL	<ul style="list-style-type: none"> 2. To minimize air and noise pollution. 3. To ensure compliance of OHS measures 4. To ensure compliance to EIA/EA regulations 	<ul style="list-style-type: none"> • No. of air quality monitoring systems set up • Implementation of Occupational Health Act, 2007 • No of awareness programmes initiated 			
INFRASTRUCTURE MONITORING AND EVALUATION STRATEGY					
ENERGY SUPPLY	<ul style="list-style-type: none"> 1. Promote utilization of clean energy 2. Energy supply and demand assessment 	<ul style="list-style-type: none"> • Amount of energy supplied against demand • Clean energy technologies adopted 	<ul style="list-style-type: none"> • Energy supply and demand assessment Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, Kenya Power
TRANSPORT	<ul style="list-style-type: none"> 1. Promote road safety 2. Control pollution 	<ul style="list-style-type: none"> • Traffic counts • Air quality Audits • No. of Road accidents reported. 	<ul style="list-style-type: none"> • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, KURA
ICT	<ul style="list-style-type: none"> 1. To ensure safe management and disposal of E-waste 	<ul style="list-style-type: none"> • Regulations on management of E-waste. 	<ul style="list-style-type: none"> • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, CCA
GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS MONITORING AND EVALUATION STRATEGY					
GOVERNANCE	<ul style="list-style-type: none"> 1. Build capacity 2. Use of Incentives to promote compliance 3. Review sectoral laws to ensure harmony in natural resource management 4. Develop and apply economic instruments and technologies 	<ul style="list-style-type: none"> • ICDC Environmental Management Unit • No. of personnel trained • Types of incentives developed • Integrated economic valuation of environmental services and resources in national planning • Increased use of appropriate incentives and technologies 	<ul style="list-style-type: none"> • Reports 	<ul style="list-style-type: none"> • Annual 	<ul style="list-style-type: none"> • ICDC, National and County governments, Line Ministries, Research and Educational Institutions, NGOs,

CHAPTER TWELVE CONCLUSION AND RECOMMENDATIONS

12.1: Overview

The broad objective of the SEA was to systematically integrate environmental considerations into the Master Plan and support decision making processes. The specific objectives were to: i. incorporate environmental sustainability measures in the design phase of the master plan, ii. provide guidelines for sustainable management of environmental aspects of the industrial park, iii. provide guidelines for incorporation of environmental issues in the sub-projects of the master plan, iv. provide environmental quality bench marks for monitoring future environmental quality of the park, and v. recommend institutional arrangements for sustainable management of environmental aspects of the industrial park.

12.2: CONCLUSION

The SEA study for the proposed EIIP has observed that there are both positive and negative environmental and social-economic impacts from implementation of the EEIP Master Plan. However, overall, the positive impacts outweigh the negative. The positive impacts include creation of many jobs, and growing of the county economy by stimulating vibrancy in the agricultural, livestock and forestry sectors. The negative impacts on the other hand are mainly disturbance of the soil during the construction phase, air pollution from industries, increased waste generation and increased demand on utility services. However, all these have been mitigated hence the negative effects have been minimized through the SESMP and the environmental monitoring plan.

Views from consultations were incorporated in the master plan continuously, helped to shape objectives of the master plan and issues to be studied in detail. They also formed part of the recommendations.

There is a deliberate effort to integrate economic, social, technological, environmental and ecological performance in the design of the park. The principle of sustainable design has been actualized at various levels ranging from land use planning, building technology and infrastructure development. Such as promoting flows within the park through material and by-product exchange through re-use, reducing and recycling in order to minimize exploitation of natural resources. Additionally, the industrial park shall employ some of the latest ecologically sensitive designs such as sustainable waste management (by applying the 3Rs), use of green energy and green infrastructure (parks/greenery, transportation conservation, solar power use) use of green architecture such as energy efficient buildings (day lighting and natural ventilations).

To ensure that what this SEA has proposed is implemented, the study proposes creation of an environmental unit by ICDC. It should be housed at the ICDC Complex within the Industrial Park. The Unit which will work very closely with the County Environmental Committee and NEMA should have a minimum of three qualified fulltime employees to run it. This will consist of an Environmental Manager and two assistants. Their work will include ensuring that all investors have environmental policies and targets for their individual sub-projects and also ensure implementation of all the recommended

mitigation measures. This will be done in collaboration with all the relevant line agencies/sectors.

12.3: RECOMMENDATIONS

For the EIIP Master Plan to achieve its intended strategic objectives and the proposed environmental strategies, the following are recommended:

- a) The proposed Environmental and Social Management Plan should be implemented effectively ensuring that all the recommended mitigation measures are implemented.
- b) ICDC should establish an Environmental Management, Coordination and Monitoring Unit to oversee all the environmental aspects of the park.
- c) The Cherunya River management plan should be implemented effectively.
- d) The formulated Development Control guidelines for construction and infrastructure development should be followed by all investors.
- e) That NEMA should consider issuing the appropriate development licence to the proposed implementation of the ICDC Industrial Park Master Plan.

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APPENDICES

1. SEA Lead Expert NEMA Registration Certificate
2. ICDC Land Ownership Documents
3. Household Interview Questionnaire
4. Key Informant Interview Guide
5. Notice to the Public For the proposed EIIP (2 Local Dailies and Kenya Gazette)
6. SEA Study Consultations Photo Gallery
7. Development Control Manual

SEA LEAD EXPERT NEMA REGISTRATION CERTIFICATE

ICDC LAND OWNERSHIP DOCUMENTS

HOUSEHOLD INTERVIEW QUESTIONNAIRE

KEY INFORMANT INTERVIEW GUIDE

**NOTICE TO THE PUBLIC FOR THE
PROPOSED EIIP (2 LOCAL DAILIES AND
KENYA GAZETTE)**

SEA STUDY CONSULTATIONS PHOTO GALLERY

DEVELOPMENT CONTROL MANUAL
