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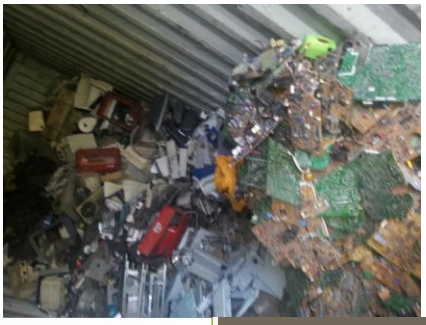
THE REPUBLIC OF KENYA

MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY (MoEST)

GPE PRIMARY EDUCATION DEVELOPMENT PROJECT



Economics

FINAL DRAFT

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

February 2015

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ACRONYMS & ABBREVIATIONS

ASAL	Arid and Semi Arid Land
BOM	Boards of Management
CEMASTEA	Centre for Mathematics, Science and Technology Education in Africa
COK	Constitution of Kenya
CPS	Country Partnership Strategy
CSO	Civil Society Organizations
DFID	Department for International Development
EAs	Environmental Assessments
EGM	Early Grade Mathematics
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMIS	Environmental Management Information System
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management Framework
ESMF	Environmental & Social Management Framework
ESMP	Environmental and Social Management Plan
FPIC	Free, prior, and informed consultation
GOK	Government of Kenya
GPE	Global Primary Education
IPPF	Indigenous Peoples Planning Framework
KCPE	Kenya Certificate of Primary Education
KNEC	Kenya National Examination Council
M&E	Monitoring and Evaluation
MOEST	Ministry of Education, Science and Technology
NESP	National Education Sector Plan
NGO	Non-Governmental Organisations
PCU	Project Coordination Unit
PIC	Public Information Center
PRIMR	Primary Research Initiative in Mathematics & Reading
SDI	Service Delivery Indicator
SIP	School Improvement Plan
TAD	Teacher Appraisal and Development
TSC	Teaching Service Commission
USAID	United States Agency for International Development
WB	World Bank

EXECUTIVE SUMMARY

Persisting inequality in education outcomes-While the growth of the private sector has potentially helped reduced the strain on public resources; it also poses the risk of increasing socio-economic stratification between schools. Kenya has already had a long streak of regional disparities in learning outcomes. Primary completion rates, along with those for enrolment, are much lower in the arid/semi-arid land areas, and other vulnerable areas in coastal regions and urban slums. National and regional assessments including National Systems for Monitoring Learning Achievements (NASMLA) and Southern Africa Consortium for Monitoring Educational Quality (SACMEQ) consistently reveal North Eastern and Western regions as underperformers over the years (KNEC 2011, 2012).

Learning Achievements-The rapid expansion of the education system is increasingly affecting Kenya's capacity to maintain and improve the quality of education. Challenges include (i) low competency levels in early grade mathematics and reading; and (ii) declining KCPE results in public schools. This is confirmed by UWEZO Kenya's 2011-2012 numeracy and literacy survey findings, which indicate that children in Kenya are not adequately learning due to various factors and that learning levels are poorest in arid and western Kenyan counties. Similarly, the Kenya National Examinations Council's (KNEC) assessment of Standard 3 learners in numeracy and literacy (National Systems for Monitoring Learning Achievements-NASMLA) in 2010 reported low attainment. Correspondingly, poor reading proficiency was reported by the Early Grade Reading Assessment (EGRA) study, which found that 14% of pupils tested in English, 19% in Kiswahili, 15% in Gikuyu and 20% in Dholuo in their last term of Standard 3 could not read a single word correctly (Piper, 2010).

Low learning achievement in Early Grade Mathematics-Kenya Vision 2030 places great emphasis on the role of mathematics education. Yet, evidence suggests that Kenyan children are not achieving minimum levels of numeracy. The Early Grade Mathematics Assessment (EGMA) study as part of the PRIMR pilot indicates low levels of competencies. For example, 30% of students at the beginning of Grade 2 cannot do simple subtraction in the 5 counties that the test was administered. In a more representative sample, UWEZO survey findings throughout 2009, 2011 and 2012 indicate that less than a third of children enrolled in grade 3 have basic grade 2 level numeracy skills.

Falling learning achievement levels in *public* schools-The influx of incoming pupils after the FPE introduces complex changes in Kenya's primary education system. Evidence suggests that the FPE successfully encouraged pupils from poorer socio-economic groups to enrol in primary schools in general. However, there was no increase in net enrolment in *public* schools. Instead, FPE has induced a large increase in demand for privateschools as richer households chose to exit the public system.[1]

[1] Based on household survey data between 1997 and 2006 (Bold, Kimenyi, Mwabu and Sandefur 2013)

Project Description

The GPE Project has four main project components. Component 1 focuses on improving early grade mathematics competencies. Component 2 supports the strengthening of school management and accountability. Component 3 aims to build capacity for evidence based policy development at national level. Component 4 covers project coordination, communication, monitoring and evaluation.

Component 1: Scaling Up Early Grade Mathematics

This will support the scaling up, across Kenya, of the early grade mathematics (EGM) methodology piloted under the Primary Research Initiative in Mathematics and Reading (PRIMR) with the support of United States Agency for International Development (USAID) and Department for International Development (DFID). The focus of the scale up is on schools located in rural areas, pockets of urban poverty and Arid and Semi Arid Lands (ASAL) Counties, which tend to be those performing poorly in mathematics. These schools estimated to comprise about 75% of all public primary schools would adopt the full EGM methodology and receive the requisite teaching/learning materials as well as training for their Grades 1 and 2 teachers and other concerned personnel. In addition, EGM materials (textbooks and teacher guides) will be made available to all 23,000 public primary schools, benefiting their students, teachers, and head teachers.

Specific activities include: (i) training of a core group of 60 master trainers (EGM champions), teachers and head teachers in EGM instructional techniques; (ii) training of TAC tutors to undertake enhanced pedagogical supervision of teachers and monitor student learning; (iii) procurement of textbooks and teacher guides developed under the PRIMR for distribution to all participating Grade 1 and 2 students and teachers; (iv) provision of tablets to TAC tutors for monitoring teacher and student performance; and (v) awareness building at the PTTCs on new instructional materials and pedagogical practices for EGM.

Component 2: Strengthened School Management

Component 2 will be a pilot to improve school performance through strengthened school management and accountability for results in the delivery of primary education. The pilot targets low performing schools (i.e. those schools whose Kenya Certificate of Primary Education (KCPE) scores in 2012 and 2013 were below the average of 242 for public primary schools), in each county and ASAL counties in particular. Based on the targeting criteria, some 6,000 schools were identified to be eligible pilot schools. From this pool, about 4,000 schools were randomly selected to be the participating or 'treatment' schools that will benefit from an integrated set of interventions whose impact can be rigorously evaluated at the end of project implementation. The interventions, to be provided under four sub components, include: (i) school specific analysis of KCPE results to inform planning at the school level; (ii) appraisal of teacher competency in knowledge, pedagogical practice and engagement; (iii) support and capacity building for school improvement planning, with enhanced participation of community stakeholders; (iv) enhanced financing to schools linked to achievement of management and accountability milestones; (v) strengthening school audit; and (vi) monitoring of pilot results.

To enable data to be directly collected from schools and reviewed to assess results of the pilot during implementation and at the end of the Project, participating schools are provided with an appropriate device (tablet/smart phone) to undertake data recording and dissemination. Key data on pupils (enrolment by gender, attendance, drop-out, transition, etc.), teachers (age, qualification, employment type, TAD profile, etc.) and school resources (financing, textbooks and learning materials, water and sanitation conditions, etc.) will be recorded and regularly updated using the tablets/smart phones. As the school grant is the same across the participating schools of varying sizes, de facto the pilot can bring evidence of optimal additional financing on top of the current unifying capitation grant. Furthermore, the choices of priorities for the school grants and the data on school characteristics will be invaluable in determining factors that improve or hinder learning achievement.

Component 3: Strengthening Data/EMIS System

Component 3 will include (i) strengthening the data/EMIS system in primary education to make data more available, reliable and integrated; (ii) enhancing the system for monitoring student learning achievement; and (iv) enhancing the capacity to develop policies on equity, efficiency and quality at the national level.

Component 1 includesprovision of electronic devises including tablets and smart phones to TAC tutors and all schools for monitoring teacher and student performance as well as for data recording and dissemination; andtriggers the environmental assessment policy (OP.4.01). This is because the procurement of these electronic devises for over 6,000 schools will introduce electronic wastes (E-Waste), which has potential adverse impacts on the environment if disposed in an unsustainable manner.E waste is the most rapidly growing problem in the waste stream due to its quantity, toxicity and carcinogenicity. Often, the toxic material is improperly disposed and thus poses a threat to human health and the environment. New and improved electronics and advanced models (e.g. cellular phone and personal computers) are coming out in the market everyday making the older models technically and technologically obsolete and less satisfying to consumers thereby contributing to potential electronic waste stream.

Environmental and Social Requirements

In order to reduce, minimise and mitigate adverse impacts and undue harm of its development projects to the environment, all bank-financed projects are guided by environmental and social policies and procedures commonly referred to as safeguards instruments. Two Banks' policies[2] have been triggered as a result of this project and they include:

1. OP 4.01(Environmental Assessment),
2. OP 4.10 (Indigenous Peoples)

[2]The World Bank Safeguard Operational Policies (OPs) are OP4.01 – Environmental Assessment; OP4.04 – Natural Habitats; OP4.09 – Pest Management; OP4.10 Indigenous Peoples; OP4.11 – Physical Cultural Resources; OP4.12 – Involuntary Resettlement; OP4.36 – Forests; OP4.37 Safety of Dams; OP7.50 – Projects on International Waterways; and OP7.60 – Projects in Disputed Areas. See www.worldbank.org/safeguards for more information.

Objective of ESMF

To address the environmental concerns that may arise as a result of the purchase of electronic devices which will be supplied to schools (electronic wastes generation) an Environmental and Social Management Framework (ESMF) has been recommended as fulfilment of the World Bank's requirement because the specific locations and scope of as well as potential environmental and social impacts are not known at this time for subprojects.

This ESMF will serve as a tool for MoEST and implementing institutions to identify and mitigate potential environmental and social impacts associated with E-waste. A management plan (E-Waste Disposal Plan) for management of the E-Waste is part of this ESMF and will be used by each school implementing or receiving electronic devices.

This ESMFclarifies environmental and social impacts/enhancements, mitigation measures to be undertaken and the institutional responsibilities for (1) implementing the E-Waste management plan (2) mitigation measures (3) monitoring the mitigation measures (4) capacity building to ensure the aforementioned responsibilities will be carried out effectively.

This ESMF has been prepared in line with the relevant World Bank (WB) safeguard policies on social and environmental management and further taken into account Government of Kenya policies, legal and institutional framework related to environmental and social assessment. The process of preparing this ESMF entailed detailed desk-top literature reviewcoupled with consultation and engagement of appropriate stakeholders.

Policy, Legal and Institutional Issues

The following legal instruments among others were reviewed and they are Government of Kenya's legislations that apply to this project as well as the bank safeguards policies.

- *Environmental Management and Coordination Act*
- *E-Waste Regulations for Kenya-Draft*
- *Constitution of Kenya*
- *Health Act*
- *World Bank safeguards policies and procedures 4.01*
- *Environmental Impact Assessment and Audit Regulations, 2003*
- *The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121*

Environmental and Social Impacts

Beneficial Impacts

The project development objectives are to improve early grade mathematics competency and to strengthen management systems at school and national levels.

Project Beneficiaries

- 6 million pupils in grade 1 and 2 who will benefit from improved early grade mathematics textbooks
- 40,000 teachers who will benefit from new methodologies of early grade mathematics instruction through improved in-service training and regular pedagogical supervision and support
- 1.3 million pupils in participating schools who will benefit from more effective and present teachers as well as improved teaching-learning inputs;
- Head teachers and Boards of Management (BoMs) who will receive guidance and support in school improvement planning and be empowered to implement plans to improve their school performance
- Parents and Communities whose aspirations will be met through greater information and enhanced voice in school management for improving quality of education.
- Education system administrators who will benefit from improved information and accountability through up to date EMIS data and school audit; and

Potential Adverse Impacts of E-Waste

The**component 1 of this GPE Project** may have significant negative impacts on the bio physical and socio-economic environment from a project specific perspective. The impacts are mainly those associated with E-waste generation, which will arise from the procurement of electronic devices like tablets and smartphones for use by all the schools in monitoring and dissemination of information.Electronic waste also known as E-waste is an informal term used to describe almost all types of Electronic and Electrical Equipment (EEE) that has entered or could enter the waste stream. It is used for almost any household or business item with circuitry or electrical components with power or battery supply that has reached its end-of-life.

The volume of electrical and electronic waste being generated is growing rapidly in developed and in developing countries. The total amount of global e-waste generated in 2005 was estimated to be 40 million tons. The latest estimates indicate that in 2012 more than 45 million tons of e-waste was generated globally. E-waste is today the fastest growing waste stream (about 4 % a year). The US Environmental Protection Agency (EPA) has even estimated a 5 to 10 % increase in the generation of e-waste each year globally. The UNU ADDRESS project documents that e-waste volume placed on the market since 1990 has grown from 19.5 million tonnes to 57.4 million tonnes in 2010 and is set to more than triple to approximately 75 million tonnes by 2015. (J Huisman 2012).

The increase of e-waste is due to exponential growth in electrical and electronic equipment production and consumption worldwide. Lower prices for many electrical goods have increased global demand for many electrical and electronic products. A generally high product obsolescence rate together with a decrease in prices and the growth in internet use are further driving factors for increasing E-waste generation. (Sources: Basel Convention, 2012, Lundgren, 2012; SBA, 2009).

Increasing quantities of E-waste and its mismanagement represent a major concern across the world due to the presence of hazardous substances such as lead, mercury, PCB, asbestos and CFC's. Uncontrolled dumping and inappropriate recycling processes generate negative impacts on the environment and pose risks to human health.

On the other hand, E-waste contains valuable materials such as gold, silver, copper, platinum, palladium, iron, aluminum, indium, gallium and rare earth metals that may be recovered thus contributing to sustainable resource management. (Sources: Basel Convention, 2012; Lundgren, 2012). The extraction of these metals from the Earth comes along with a significant environmental impact. E-waste recycling thus contributes to sustainable resource management.

E-waste can be a dangerous threat to human health and the environment including persistent, bio-accumulative and toxic substances, such as brominated flame retardants, heavy metals (e.g., lead, nickel, chromium, mercury), and persistent organic pollutants (e.g, polychlorinated biphenyls (PCBs). This threat can result from two sources. The first is from the leaching of hazardous substances, in particular lead, mercury, cadmium, and lithium into the environment from e-waste that is disposed of in landfills. The second is from improper recycling techniques, which are in particular employed in the informal recycling sector in developing countries and currently result mainly from the export of e-waste to these countries, but increasingly also from domestic disposal.

Capacity Building and Training

Capacity building and training is proposed in this ESMF in the form of awareness and sensitization workshops targeting users of electronic devices in the 6,000 schools. The sensitization and awareness will focus on imparting knowledge on users on best practises in E-waste management including emphasis to recycle or take back E-wastes to dedicated centres, environmental and health impacts of improper E-waste disposal as well as emphasising the need for the project to procure electronic devices from credible manufactures to avoid purchasing refurbished or second hand devices with a short shelf life.

Public Consultations

The ESMF has been prepared through a participatory process involving public consultation as required by the World Bank procedures. Annex**A**shows the institutions and stakeholders consulted during the preparation of this ESMF.

Project Implementation

The project implementation will be mainstreamed into the government education management system. The primary responsibility of the project management rests with the Ministry of Education, Science and Technology. The Teacher Service Commission will be responsible for the implementation of the teacher appraisal process at the school level. The KNEC will be responsible for the analysis of the KCPE results and the implementation of the national assessments of Grade 2 in mathematics and Grade 3 in

core subjects as well as the dissemination of SACMEQIV. A committee led by the MoEST Principal Secretary and consisting of the TSC and KNEC Chief Executives will be responsible for overseeing the progress and effectiveness of the project interventions.

MoEST will appoint three full-time personnel to be responsible for the day-to-day project coordination and implementation. There will be one project coordinator and two deputy coordinators. One deputy coordinator will be in charge of Component 1 and the other deputy coordinator will be in charge of Component 2 and 3.

Component 1 implementation will be coordinated with inputs from the Basic Education Directorate, Procurement/Supply team for the textbook procurement and from Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) for the training and pedagogical supervision. Component 2 will be coordinated inputs from Basic Education Directorate, KNEC and TSC and School Audit Department. Various concerned departments such as the Planning Directorate, the Policy Directorate, the Education Standards and Quality Assurance Council and the Basic Education Directorate will implement component 3.

A Project Coordination Unit (PCU) will be established to coordinate the project activities. The PCU is accountable to the Principal Secretary and will be headed by a full-time Project Coordinator and two Deputy Project Coordinators.

Safeguards instruments preparation and implementation; - This ESMF contains an E-Waste Management/Disposal Plan which is expected to be used by each school that will receive electronic devises during the project life. It will be the responsibility of each school to ensure that the disposal plan is followed and that mitigation measures proposed are adhered to. National Environment Management Authority and the PCU undertake monitoring and supervision and reporting to the Bank in respect to the implementation nd compliance with the disposal plan.

Organisation of ESMF Report

The ESMF report is organized as follows:

- *Acronyms and abbreviations*
- *Executive summary*
- *Chapter 1-Introduction Chapter and description of the proposed project*
- *Chapter 2-Study Methodology*
- *Chapter 3-Baseline information*
- *Chapter 4-Description of National and International Regulatory Framework*
- *Chapter 5-World Bank Environmental and Social Safeguards Policies*
- *Chapter 6- Determination of Potential Environmental Impacts*
- *Chapter 7- Project Coordination and Implementation Arrangements*
- *Chapter 8 - Capacity building and training requirements*
- *Chapter 9- Public Consultations and Disclosure*
- *Chapter 10 - Reference*

2 INTRODUCTION

2.1 Background and Context

Persisting inequality in education outcomes-While the growth of the private sector has potentially helped reduced the strain on public resources, it also poses the risk of increasing socio-economic stratification between schools. Kenya has already had a long streak of regional disparities in learning outcomes. Primary completion rates, along with those for enrolment, are much lower in the arid/semi-arid land areas, and other vulnerable areas in coastal regions and urban slums. National and regional assessments including National Systems for Monitoring Learning Achievements (NASMLA) and Southern Africa Consortium for Monitoring Educational Quality (SACMEQ) consistently reveal North Eastern and Western regions as underperformers over the years (KNEC 2011, 2012).

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Falling learning achievement levels in *public* schools-The influx of incoming pupils after the FPE introduces complex changes in Kenya's primary education system. Evidence suggests that the FPE successfully encouraged pupils from poorer socio-economic groups to enrol in primary schools in general. However, there was no increase

in net enrolment in *public* schools. Instead, FPE has induced a large increase in demand for privateschools as richer households chose to exit the public system.[3]

The project activities are aligned with the Government's strategic objective of providing quality basic education for Kenya's sustainable development. Vision 2030 places great emphasis on linking education and labor market. To that end the National Education Sector Plan (NESP) 2013-2018 focuses on improving the quality of primary education, through: (i) improvement of schooling outcomes and impact of sector investment; (ii) development of relevant skills; (iii) improved learning outcomes; and (iv) improved efficiency and effectiveness in use of available resources. The GPE financed project, taking on two result areas of improving early grade learning competencies and strengthening the delivery systems, responds directly to all the NESP target areas.

The project is well aligned with the GPE goals of: (i) ensuring that all children master basic literacy and numeracy by early grades; and (ii) building national systems that have capacity and integrity to deliver, support and assess education quality. The project is also in line with the GPE focus that resources be targeted to the most marginalized groups, including schools with children with disabilities, schools in rural and nomadic communities in the ASAL with low female enrolment as well as schools in urban poor settlements.

The project is aligned with the twin goals of the World Bank's strategy on poverty reduction and boosting shared prosperity. Education builds human capital that directly contributes to enhancing productivity and welfare of the population, especially the poorest strata. Investing in human potential advances many development goals, from health and gender equity to civic engagement and innovation. By unleashing the power of the human mind, education provides individuals with opportunities to improve their own quality of life and allows them to make meaningful contributions to their communities.

The proposed project is also well aligned with the World Bank's Education Strategy Learning for All, which promotes investment in education, early, smartly and for all. To achieve the Learning for All, the World Bank is working with client countries and development partners to help reform the education systems beyond inputs. While trained teachers, classrooms and textbooks are crucial, education systems deliver better results when standards, rules, responsibilities, financing and incentives are clear and aligned, and outcomes are measured and monitored.

2.2 Purpose of the ESMF

This ESMF will at a minimum (i) identify all relevant potential environmental risks and social concerns that may arise as a result of the proposed Project specifically related to E-Waste generation and associated impacts; (ii) specify appropriate roles and responsibilities of involved actors and parties; (iii) outline the necessary procedures for

[3] Based on household survey data between 1997 and 2006 (Bold, Kimenyi, Mwabu and Sandefur 2013)

managing and monitoring environmental risks and social concerns related to E-Waste; (iv) determine the training, capacity building and technical assistance needed to successfully and effectively implement the provisions of the ESMF; (v) establish the Project funding required to implement the ESMF requirements.

2.3 Rationale for the ESMF

The procurement of electronic devices (laptops, tablets and smartphones) for over 6000 schools in large quantities and replacement through out the project life will lead to the generation of a significant volumesof E-Waste. However, the actual quantities and types of the devises to be procured remains unknown at this point in time including the institutions/schools that will be the beneficiaries of these gadgets, hence the necessity for an ESMF.

This ESMF provides a general impact identification framework to assist project implementers to institute measures to address adverse environmental and social impacts associated with E-Waste. Specific information on country-wide project locations, bio-physical features etc. when known at a later stage will trigger the preparation of site specific E-Waste Disposal/Management Plans, however, a generic E-Waste disposal plan has been prepared as part of this ESMF and will be used by individual schools to prepare institution specific disposal/management plans for mitigating impacts associated with E-Waste.

2.4 Project Description

2.4.1 Objectives of the Project

New GPE funding will help Kenya to address key challenges in the primary education and rebuild the country's credibility. The project is intended to provide catalytic funding to help Kenya address areas not yet fully covered by other initiatives, drawing on the experience and lessons learnt from past projects. Specifically, the GPE project will contribute to:

- Improving early grade learning competencies by focusing on the scaling up of the Early Grade Mathematics intervention piloted under PRIMR. The decision to scale up is based on encouraging evidence from rigorous impact evaluations of the pilot. Specifically, the end line evaluation of the USAID funded intervention in 547 low performing rural and peri-urban schools finds that after one year of implementation, test scores across different mathematics subtasks improved by more than 0.2 standard deviations on average. The midterm evaluation of an on-going DFID funded intervention in another 834 rural schools finds that after only four instructional months, the effect on mathematics performance is very similar to that of the USAID intervention. Notably, assessment of different treatment packages suggests that it is critical to have all the elements of the full PRIMR intervention, including teacher training, textbooks provision, instructional support and teachers' guides, to have a meaningful impact on student performance. Even

with the full intervention, it is estimated that PRIRM is more cost-effective than many other previous pilots in Kenya (Piper and Mugenda 2014a, 2014b).

- Strengthening systems (at school and national levels) for improving primary education service delivery. At the school level, the idea stems from the notion that well-functioning school management committees (comprising the head teacher, parents and other key stakeholders) are able to mobilize and/or utilize resources effectively to improve learning conditions through notably, measures to reduce teacher and student absenteeism, thereby increasing teacher-student contact time in the classroom. Furthermore, in schools where such measures have emerged from a participatory decision making process, and accountability for the use of resources strengthened through oversight by community stakeholders (village elders, parents, and students), significant improvement in student learning has been observed.[4] In this component, schools serving vulnerable groups will deliberately be targeted for the project interventions.

2.4.2 ProjectComponents:

Component 1: Scaling Up Early Grade Mathematics

Component 1 will support the scaling up, across Kenya, of the early grade mathematics (EGM) methodology piloted under the Primary Research Initiative in Mathematics and Reading (PRIMR) with the support of USAID and DFID. The focus of the scale up is on schools located in rural areas, pockets of urban poverty and ASAL counties, which tend to be those performing poorly in mathematics. These schools estimated to comprise about 75% of all public primary schools will adopt the full EGM methodology and receive the requisite teaching/learning materials as well as training for their Grades 1 and 2 teachers and other concerned personnel. In addition, EGM materials (textbooks and teacher guides) will be made available to all 23,000 public primary schools, benefiting their students, teachers, and head teachers.

Specifically, the overall goal being to help teachers improve students' ability to master basic numeracy skills, the component will finance the implementation of a comprehensive program (the EGMA package) to increase teacher competency, provide adequate instructional materials, and strengthen classroom pedagogical support. Specific activities include: (i) training of a core group of 60 master trainers (EGM champions), teachers and head teachers in EGM instructional techniques; (ii) training of TAC tutors to undertake enhanced pedagogical supervision of teachers and monitor student learning; (iii) procurement of textbooks and teacher guides developed under the PRIMR for distribution to all participating Grade 1 and 2 students and teachers; (iv) provision of

[4] Randomized, controlled trials in the Gambia (D. Evans, et al, World Bank, 2011) and Uganda (A. Zeitlin, et al, Oxford University, 2011) show statistically significant impacts of school-based management (school management committees, school grant program, capacity building) on reducing student and teacher absenteeism.Evidence from 22 impact evaluations in developing countries ("Making Schools Work", B. Bruns, H. Patrinos, D. Filmer, World Bank, 2011) indicate that three key strategies to strengthen accountability relationships in school systems - information for accountability, school-based management, and teacher incentives - can affect school enrolment, completion, and student learning.

tablets to TAC tutors for monitoring teacher and student performance; and (v) awareness building at the PTTCs on new instructional materials and pedagogical practices for EGM.

Component 2: Strengthened School Management

Component 2 will be a pilot to improve school performance through strengthened school management and accountability for results in the delivery of primary education. The pilot targets low performing schools (i.e. those schools whose Kenya Certificate of Primary Education (KCPE) scores in 2012 and 2013 were below the average of 242 for public primary schools), in each county and ASAL counties in particular. Based on the targeting criteria, some 6,000 schools were identified to be eligible pilot schools. From this pool, about 4,000 schools were randomly selected to be the participating or 'treatment' schools that will benefit from an integrated set of interventions whose impact can be rigorously evaluated at the end of project implementation. The interventions, to be provided under four sub components, include: (i) school specific analysis of KCPE results to inform planning at the school level; (ii) appraisal of teacher competency in knowledge, pedagogical practice and engagement; (iii) support and capacity building for school improvement planning, with enhanced participation of community stakeholders; (iv) enhanced financing to schools linked to achievement of management and accountability milestones; (v) strengthening school audit; and (vi) monitoring of pilot results.

Under the first sub component, the Kenya National Examination Council (KNEC) will produce reports on school specific analysis of KCPE results for the participating schools. The report will tabulate the percentage of students with correct scores on each test item and analyze the patterns of students choosing the distracters, with the aim of revealing student knowledge level, their misconceptions and misunderstanding. A profile of student cognitive skills (Bloom taxonomy) will be compiled to inform schools on how well they are providing their students with higher order cognitive skills. Finally, the report also includes an analysis on syllabus coverage and feedback on curriculum delivery at the school level, which is crucial for schools to identify their weaknesses and select appropriate measures to improve their curriculum delivery.

Sub component two will enable participating schools to implement the Teacher Appraisal and Development (TAD) tool developed by the Teaching Service Commission. Head teachers, teachers and TAC tutors will be trained in the use of the tool, which benchmarks teachers' knowledge, pedagogical practice and engagement against professional standards, using evidence and the results of a peer-review process. This is expected to contribute useful feedback for school improvement planning in general, and to teachers specifically, for their professional development.

Under the third sub component, participating schools will be provided with the resources to develop a School Improvement Plan (SIP) to address their key student learning challenges, and thereafter carry out the priority actions under this plan. Each school will be able to hire a facilitator to assist in the planning process, particularly to ensure that the SIP is: (a) based on sound problem diagnosis (using the outputs of the first two sub

components); and (b) reflect the priorities that have been fully consulted with key stakeholders in the school community.

To enable data to be directly collected from schools and reviewed to assess results of the pilot during implementation and at the end of the Project, participating schools are provided with an appropriate device (tablet/smart phone) to undertake data recording and dissemination. Key data on pupils (enrolment by gender, attendance, drop-out, transition, etc.), teachers (age, qualification, employment type, TAD profile, etc.) and school resources (financing, textbooks and learning materials, water and sanitation conditions, etc.) will be recorded and regularly updated using the tablets/smart phones. As the school grant is the same across the participating schools of varying sizes, de facto the pilot can bring evidence of optimal additional financing on top of the current unifying capitation grant. Furthermore, the choices of priorities for the school grants and the data on school characteristics will be invaluable in determining factors that improve or hinder learning achievement.

Key results of this component include: (i) number of participating schools receiving KCPE analysis reports; (ii) percentage of teachers in participating schools completing professional competency assessment; (iii) number of participating schools submitting satisfactory SIPs; (iv) number of participating schools receiving annual school grant allocations; and (v) number of participating schools audited.

Component 3: Strengthening Data/EMIS System
Component 3 will include (i) strengthening the data/EMIS system in primary education to make data more available, reliable and integrated; (ii) enhancing the system for monitoring student learning achievement; and (iv) enhancing the capacity to develop policies on equity, efficiency and quality at the national level.

Component 4: Project Management Functions
Finally, Component 4 covers key project management functions including coordination, communication and result monitoring and evaluation.

2.4.3 Project Beneficiaries

The project development objectives are to improve early grade mathematics competency and to strengthen management systems at school and national levels.

Project Beneficiaries

- 6 million pupils in grade 1 and 2 who will benefit from improved early grade mathematics textbooks
- 40,000 teachers who will benefit from new methodologies of early grade mathematics instruction through improved in-service training and regular pedagogical supervision and support
- 1.3 million pupils in participating schools who will benefit from more effective and present teachers as well as improved teaching-learning inputs;

- Head teachers and Boards of Management (BoMs) who will receive guidance and support in school improvement planning and be empowered to implement plans to improve their school performance
- Parents and Communities whose aspirations will be met through greater information and enhanced voice in school management for improving quality of education.
- Education system administrators who will benefit from improved information and accountability through up to date EMIS data and school audit;

PDO level result indicators: the project will monitor the following indicators

- Improvement in mathematics competencies of Grade 2 students between 2015 and 2018
- Number of participating schools completing top two priorities of School Improvement Plans
- EMIS data for primary education published annually from 2016
- NASMLA conducted and disseminated in 2015 and 2018

2.4.4 *Relationship to Country Partnership Strategy (CPS)*

World Bank support to Government's program in education sector is contained in the new Country Partnership Strategy (CPS) that has recently been approved and launched. The CPS emphasizes importance of: (i) human resource development to help people of Kenya realize their full potential and to live in dignity, reduce inequality and social exclusion to develop shared prosperity; and (ii) improving skills development, notably for young people. The project has special focus on developing foundational skills in numeracy at early age to enable students to continue successfully their educational path, to be fit for jobs, to be competitive in the labor market, employed and integrated into the economy. The ultimate outcome is improved livelihood especially of the disadvantaged groups of the population. The Project has a strong emphasis on strengthening governance and management systems at the national and school levels, which align with the CPS priorities on linking social accountability with enhanced development outcomes. The CPS highlights the World Bank's support to Kenya in roll-out of basic transparency and citizen participation mechanism in planning, budgeting, and performance management.

2.5 Project Institutional and Implementation Arrangements

2.5.1 *Implementation Arrangements*

The project implementation will be mainstreamed into the government education management system. The primary responsibility of the project management rests with the Ministry of Education, Science and Technology. The Teacher Service Commission will be responsible for the implementation of the teacher appraisal process at the school level. The KNEC will be responsible for the analysis of the KCPE results and the implementation of the national assessments of Grade 2 in mathematics and Grade 3 in core subjects as well as the dissemination of SACMEQIV. A committee led by the MoEST Principal Secretary and consisting of the TSC and KNEC Chief Executives will be responsible for overseeing the progress and effectiveness of the project interventions.

MoEST will appoint three full-time personnel to be responsible for the day-to-day project coordination and implementation. There will be one project coordinator and two deputy coordinators. One deputy coordinator will be in charge of Component 1 and the other deputy coordinator will be in charge of Component 2 and 3.

Component 1 implementation will be coordinated with inputs from the Basic Education Directorate, Procurement/Supply team for the textbook procurement and from Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) for the training and pedagogical supervision. Component 2 will be coordinated inputs from Basic Education Directorate, KNEC and TSC and School Audit Department. Various departments such as the Planning Directorate, the Policy Directorate, the Education Standards and Quality Assurance Council and the Basic Education Directorate will implement component 3. A Project Coordination Unit (PCU) will be established to coordinate the project activities. The PCU is accountable to the Principal Secretary and will be headed by a full-time Project Coordinator and two Deputy Project Coordinators.

Safeguards instruments preparation and implementation; - This ESMF contains an E-Waste Management/Disposal Plan which is expected to be used by each school that will receive electronic devises during the project life. It will be the responsibility of each school to ensure that the disposal plan is followed and that mitigation measures proposed are adhered to. National Environment Management Authority and the PCU undertake monitoring and supervision and reporting to the Bank in respect to the implementation and compliance with the disposal plan.

The E-Waste Management Plan developed as part of this ESMF is generic and will be used as guidance by each school that will receive electronic devices to prepare specific management plan which may not necessarily vary from the generic management plan provided in this ESMF. These specific E-Waste Management Plans will be consolidated into one plan by County and submitted to NEMA and the World Bank for approval.

These planswill be reviewed by the World Bank and must receive a no-objection from the World Bank before the procurement can be undertaken. None of the likely schools have sufficient capacity to prepare management plans and take full responsibility for safeguards implementation. Hence, the PCU provide support by contracting a consultant to prepare the documents. The schools will also receive training on safe handling and disposal of the E-Wastes generated in accordance with the plans.

3 METHODOLOGY AND CONSULTATION

3.1 Detailed & In-depth Literature Review

Review on the existing baseline information and literature material was undertaken and helped in gaining a further and deeper understanding of the proposed project. A desk review of Kenya's legal framework and policies related to electronic wastes was also conducted in order to the relevant legislations and policy documents that should be considered during project implementation. Among the documents that were reviewed in order to familiarise and further understand the project included:

World Bank Related Documents

- *Aide Memoire*
- *World Bank Safeguards Policies*
- *Project Concept Note*
- *Project Appraisal Document*

Kenya's Legislative Documents

- *Environmental Management and Coordination Act*
- *E-Waste Management Regulations for Kenya -Draft*
- *Constitution of Government of Kenya*
- *Health Act*
- *Environmental Impact Assessment and Audit Regulations, 2003*
- *The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121*

3.2 Interactive Discussions

Stakeholder consultation formed part of the methodology in preparing this ESMF where stakeholders who could be identified at this early stage were consulted.Stakeholders mainly included representatives from Ministry Education, Science and Technology, County Education Offices in Nakuru, West Pokot and Baringo Counties; as well as with Head teachers and Boards of Management (BoMs) in Nakuru, West Pokot and Baringo Counties.

3.3 Preparation of ESMF

Preparation of the ESMF included the following stages:

- *Collation of baseline data on the environmental conditions of the country in general;*
- *Identification of positive and negative environmental and social impacts electronic waste;*
- *Identification of environmental and social mitigation measures for electronic waste (Disposal Plan);*
- *Formulation of environmental and social monitoring plans.*

4 BASELINE DATA

This section describes the overall baseline condition of Kenya in terms of biophysical environment, as well as the socio-economic.

4.1 Location and Size

Kenya (***Figure 1***) is located in the eastern part of the African continent approximately between latitudes $4^0$21' N and 4^o 28' S and between longitudes 34^o and 42^o E. Kenya is bordered by Uganda to the west, Ethiopia and South Sudan to the north, Tanzania to the south and Somalia and the Indian Ocean to the east. Kenya covers an area of approx. 587,000 km2, of which 11,000 km^2 consists of water bodies.

Kenya's landscape is grouped into geographical zones including; the Savannah Lands covering most of the arid and semi- arid areas, the Coastal Margin, the Rift Valley, the Highlands and the Lake Victoria Basin.

Kenya sits on the Equator in East Africa. It is bordered by the Indian Ocean to the east, Somalia and Ethiopia to the north, South Sudan to the Northwest, Tanzania to the South, and in the West, by Uganda. Kenya is Africa's tenth most populated country and ranks 22^{nd} in terms of its size (Source: Survey of Kenya 2003)

Kenya lies along the equator in East Africa. Most of the country consists of high plateau areas and mountain ranges that rise up to 3,000 m and more. The plateau area is dissected by the Eastern Rift Valley, which is 40-50 km wide and up to 1,000 m lower than the flanking plateau. The narrow coastal strip along the Indian Ocean is backed by a zone of thorn bush-land. Some areas in central Kenya, at the flanks of the Rift Valley, and in western Kenya, close to Lake Victoria, are very densely populated.

The land stretches from the sea level (Indian Ocean) in the east through a diversity of landforms. From the coast, the altitude changes gradually through the coastal belt and plains (below 152Metres above sea level), the dry intermediate low belt to what is known as the Kenya Highlands (over 900 Metres above sea level). The country is split by the Great Rift Valley into the Western part, which slopes into Lake Victoria from the Mau ranges and Mount Elgon (4,300m) and the Eastern part dominated by Mt. Kenya and the Aberdare Ranges, which rise to 5,200m and 4,000m respectively.

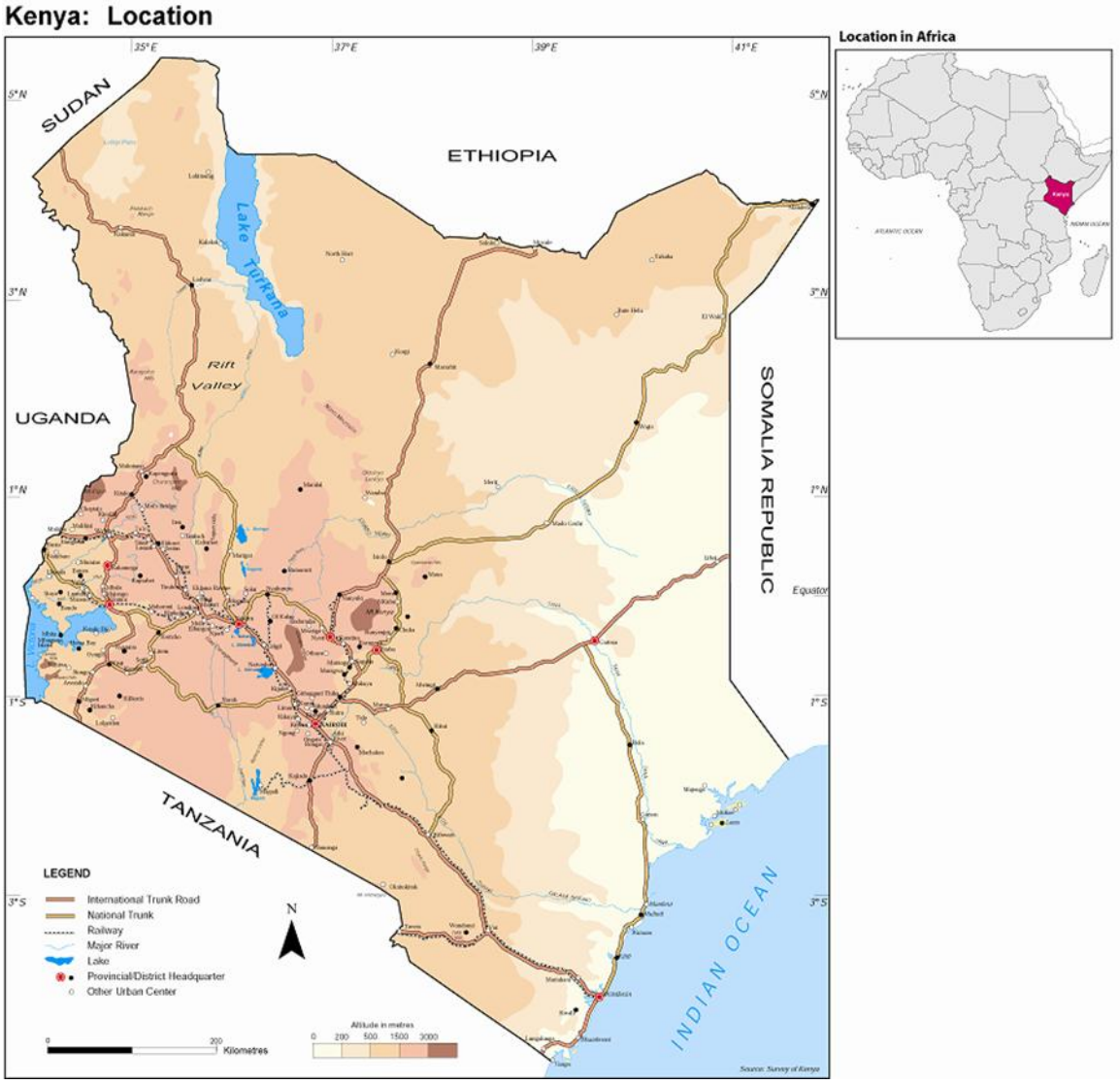

Figure 1: Map of Kenya

4.2 Physical Environment

4.2.1 Climate

Kenya enjoys a tropical climate. It is hot and humid at the coast, temperate inland and very dry in the north and northeast parts of the country. The average annual temperature for the coastal town of Mombasa (altitude 17 Metres) is 30.30 Celsius maximum and 22.40 Celsius minimum, the capital city, Nairobi (altitude 1,661 Metres) 25.20 Celsius maximum and 13.60 Celsius minimum, Eldoret (altitude 3,085) 23.60 Celsius maximum and 9.50 Celsius minimum, Lodwar (altitude) 506 Metres) and the drier north plain lands 34.80 Celsius maximum and 23.70 Celsius minimum.

The long rains occur from April to June and short rains from October to December. The rainfall is sometimes heavy and when it does come it often falls in the afternoons and evenings. The hottest period is from February to March and coldest in July to August.

4.3 Topography and Drainage

The Republic of Kenya has an area of approximately 582,646 sq. km. comprising of 97.8% land and 2.2% water surface. Only 20% of the land area can be classified as medium to high potential agricultural land and the rest of the land is mainly arid or semiarid. Forests, woodlands and national reserves and game parks account for ten percent (10%) of the land area, i.e. 58,264 sq. km.

Kenya's total land surface comprises of 13,396 km^2 of water surface. This water surface comprise of a number of small lakes with fluctuating limits as well as part of Lake Victoria and most of Lake Turkana. Only 3,831 km^2 of Lake Victoria is in Kenya while most of Lake Turkana lies in Kenya. Kenya's coastal line extends approximately 402 km along the Indian Ocean.

Topographically, the country may be divided into 4 distinct geographical and ecological regions or zones with different patterns of land use, namely; the coastal plain, the arid low plateau, the highlands, and the Lake Victoria basin. The rainfall patterns are extremely varied but generally follow those regions, with the Lake Victoria basin receiving the heaviest and most consistent rainfall.

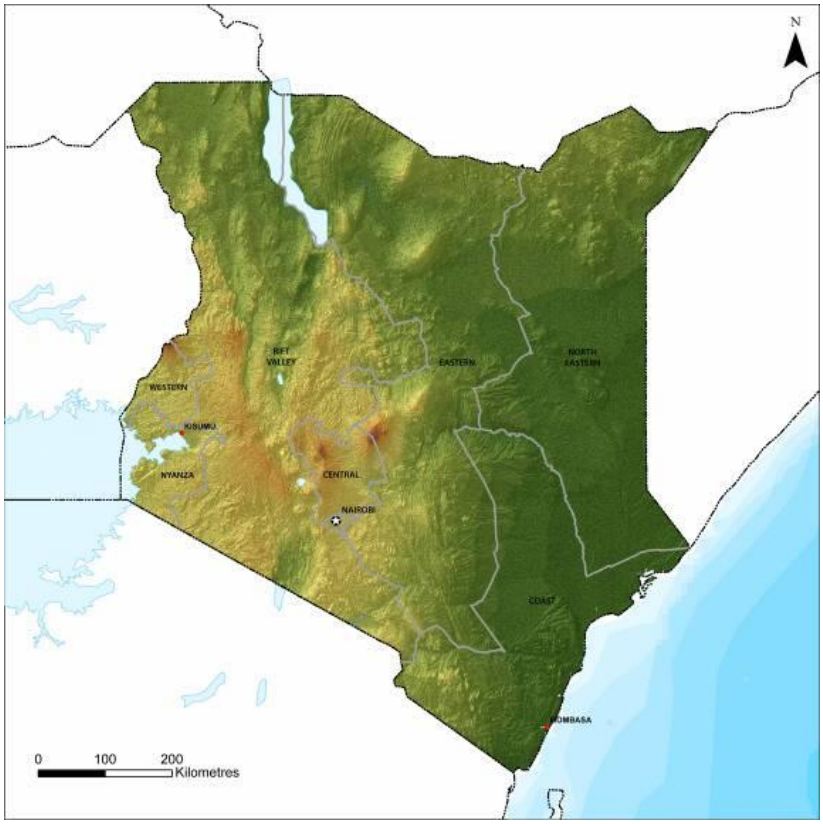

Figure 2: Topography and Drainage of Kenya

Kenya's relief can be roughly divided into six major regions: the lowlands of the coastal belt and plains; the Buruma Wajir Low land belt; the Foreland Plateau; the Highlands

(East and West);the Nyanza Low Plateau(partof the Lake Victoria Basin);and the Northern Plain lands(Survey of Kenya2003).

A small percentage of the water surface area is covered by surface drainage. This drainage is determined primarily by the Rift Valley, which roughly bisects the highland zone from North to South. Within the Rift Valley, drainage is into a chain of lakes, which have no surface outlet west of the Rift Valley rivers drain into Lake Victoria. To the East, rivers follow a southeasterly course into the Indian Ocean.

In some areas, topography and rainfall - runoff regime have created many semi-closed, poorly drained or overflow areas that retain a substantial amounts of runoff which originate on the sloped areas. On groundwater, the country is divided into three broad areas. These are volcanic rocks, Precambrian metamorphic basement rocks and Precambrian intrusive rocks and sedimentary rocks. The volcanic rocks cover 26% of the country, more commonly in the western half of Kenya. The Precambrian rocks cover an area which is approximately 17% of the country and are widely distributed in the central, western and north western parts of Kenya. Water in these areas occurs in deep horizons of faults, and fractures. Aquifers are generally unconfined and yields and water levels vary within rocks. The sedimentary rocks cover 55% of the country, predominantly in the eastern parts. These areas have loose and permeable sediments. The aquifers are shallow and unconfined and most of them are generally saline. The salinity results from accumulation of solute evaporite minerals within the sediments. Groundwater sources occur in old land surfaces, which are weathered zones between successive lava flows that signify periods of quiescence. Fractures, faults, fissures and joints are also useful.Water is mainly of bicarbonate type with low total dissolved solids. Local pockets of high fluoride are believed to be of volcanic and fumarolic origin.

4.3.1 Hydrology

Kenya's four largest inland water bodies (Lake Victoria, Lake Turkana, Lake Naivasha, and Lake Baringo) account for about 1.9 per cent of the land area. The majority of Kenya's lakes, including both saline and freshwater, and closed and open basin systems, are located within the Great East African Rift Valley. Kenya's major permanent rivers originate in the highlands. The Nzoia, Yala, SonduMiriu, and Migori rivers drain into Lake Victoria. The EwasoNgiro River is found in the northeastern part of the country and the Tana and Athi rivers flow in the southeastern part. The rivers draining into Lake Victoria (covering over 8 per cent of Kenya's land area) provide about65 per cent of Kenya's internal renewable surface water supply. The Athi River drainage area (11per cent of Kenya's land area) provides 7 per cent, the lowest share among Kenya's major drainage areas (Survey of Kenya 2008 and MOWI).

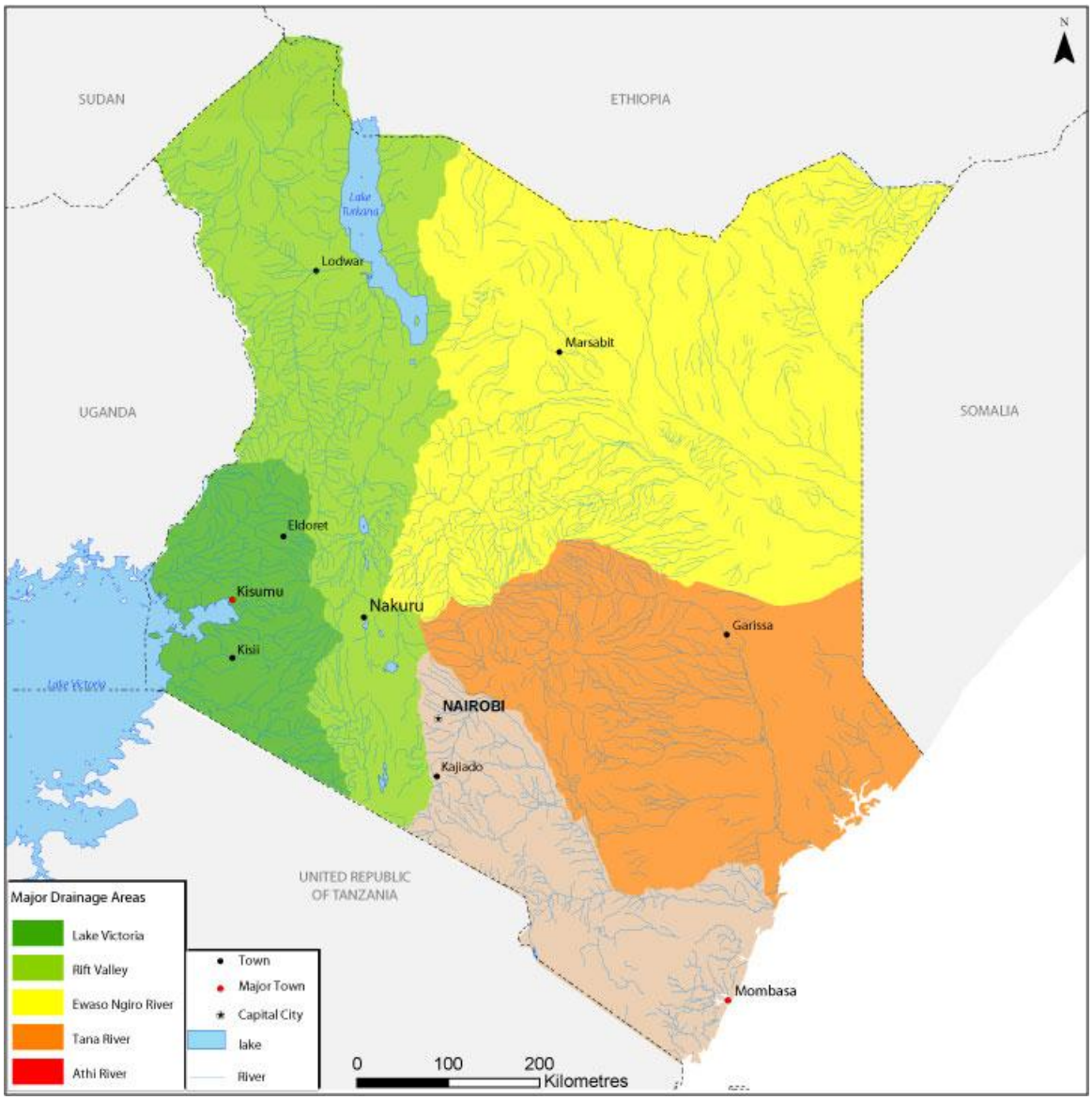

Figure 3: hydrological Map of Kenya

4.3.2 Soils and Geology

The geology of Kenya is characterized by Archean granite/greenstone terrain in western Kenya along Lake Victoria, the Neoproterozoic 'Pan-African' Mozambique Belt, which underlies thecentral part of the country and Mesozoic to Recent sediments underlying the eastern coastal areas. The Eastern Rift Valley crosses Kenya from north to south and the volcanics associated with rift formation largely obliterate the generally north-south striking Neoproterozoic Mozambique Belt (Schlueter 1997). Rift Valley volcanogenic sediments and lacustrine and alluvial sediments cover large parts of the Eastern Rift.

About 59 per cent of Kenya's soils have moderate to high fertility, meaning they are theoretically suitable for growing crops. Fertility levels, however, depend on the amount of rainfall. Given the distribution and variability of rainfall in Kenya, only about 17 per

cent of the land area has medium to high potential for crops, while the remaining 83 per cent is classified as arid and semi-arid and so of low crop growing potential (Survey of Kenya 2003). Dry lands, however, provide essential habitat for about half the country's livestock and 70 per cent of Kenya's wildlife (UNCCD 2002).

4.4 Biological Environment

Kenya's land is covered by different types of vegetation according to the climate, topography, and other physical factors. The major categories are grassland, forests, semi-deserts, and mountains. Human impacts on the land continue to alter the distribution, amount, and health of these ecosystems (Survey of Kenya 2003).

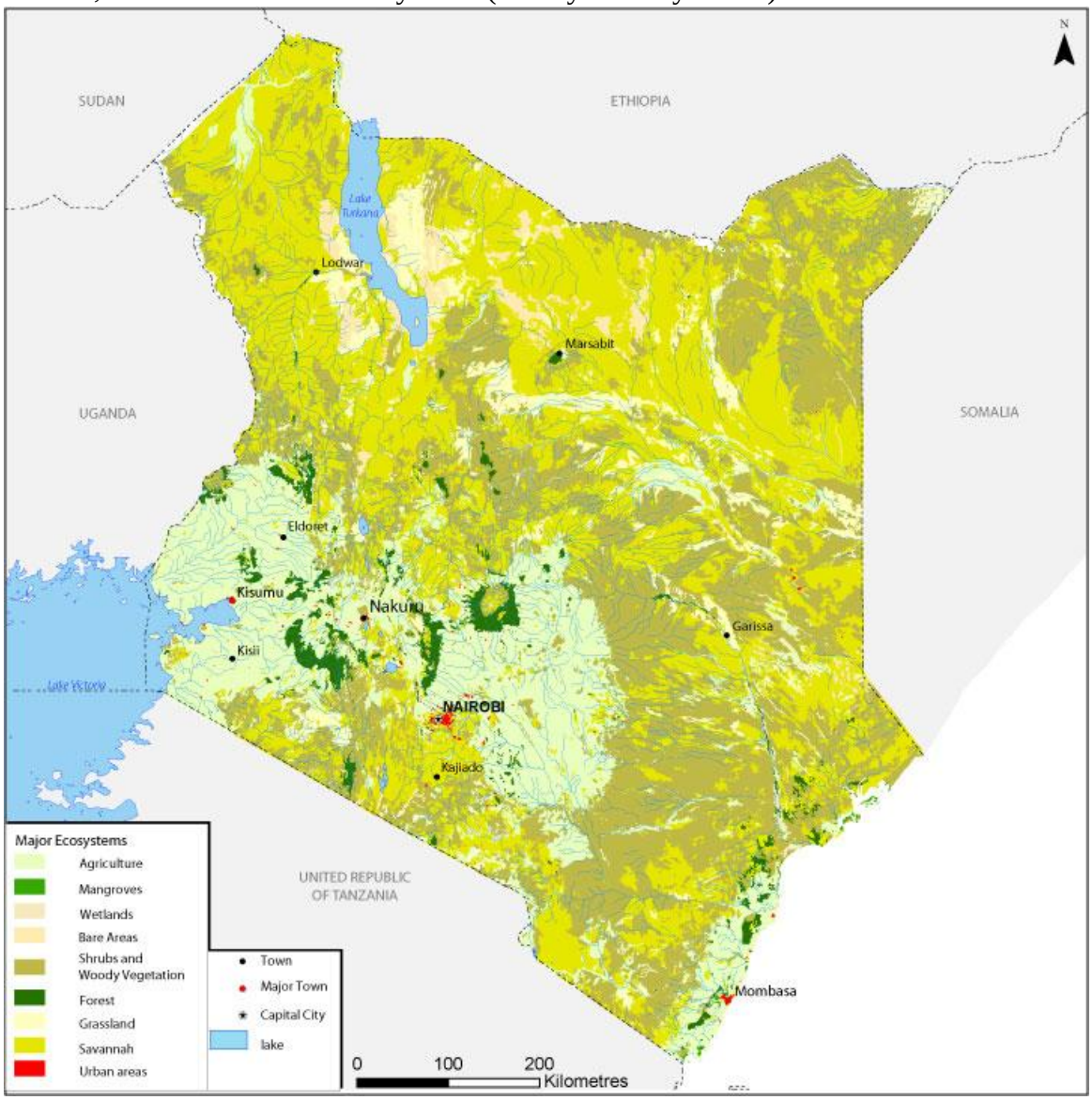

Figure 4: Major ecosystems in Kenya

4.4.1 *Forests and Woodlands*

Forests cover 2.9 per cent of Kenya's land area (KFMP 1995). The main forest types are moist highland forest, dry forest, tropical rain forest, coastal forest, and riverine and mangrove forests (Survey of Kenya 2003). Although they are not extensive land cover, Kenya's forests provide significant goods and services, including numerous non-timber forest products that provide local people with food, fibres, medicines, and shelter. The closed canopy forests are habitat for a disproportionately large percentage of the country's wildlife and other biodiversity. It is estimated that they harbor 40 per cent of large mammals, 30 per cent of birds and 35 per cent of the nation's butterflies. About half of Kenya's threatened mammals and birds are found in its forests (Survey of Kenya 2003).

4.4.2 *Freshwaters and Wetlands*

Kenya's wetlands occur in both fresh and salt waters. They include coral reefs, mangroves, deltas, creeks, lakeshores, rivers, marshes, ponds, impoundments, and mountain bogs. They are a source of water, provide numerous ecosystem services, and have a high diversity of characteristic biota or living organisms (Ramsar Convention 2001).

Kenya's wetlands cover about 14 000 km2 (2-3 per cent of the country's surface area) and are found along the major rivers. In addition, many seasonal and temporary wetlands occur all over the country, including rock pools and springs in the southern part of Nairobi, west of Ngong Hills, and at Limuru. Wetlands have also been created by damming water for hydroelectricity and water supplies, and some wetlands have been built to treat wastewater (Macharia 2004).

Wetlands are a source of social-cultural and economic potential providing people with food, medicinal products, firewood, and materials for building and handicrafts. Rapid population growth, agricultural operations, and encroachment of development pose a serious threat to wetlands. Expanding industries and urban centers discharge their waste water into them and the polluted waters are unhealthy for human and livestock use, destroy aquatic life, and restrict recreation opportunities (Ramsar Convention 2001).

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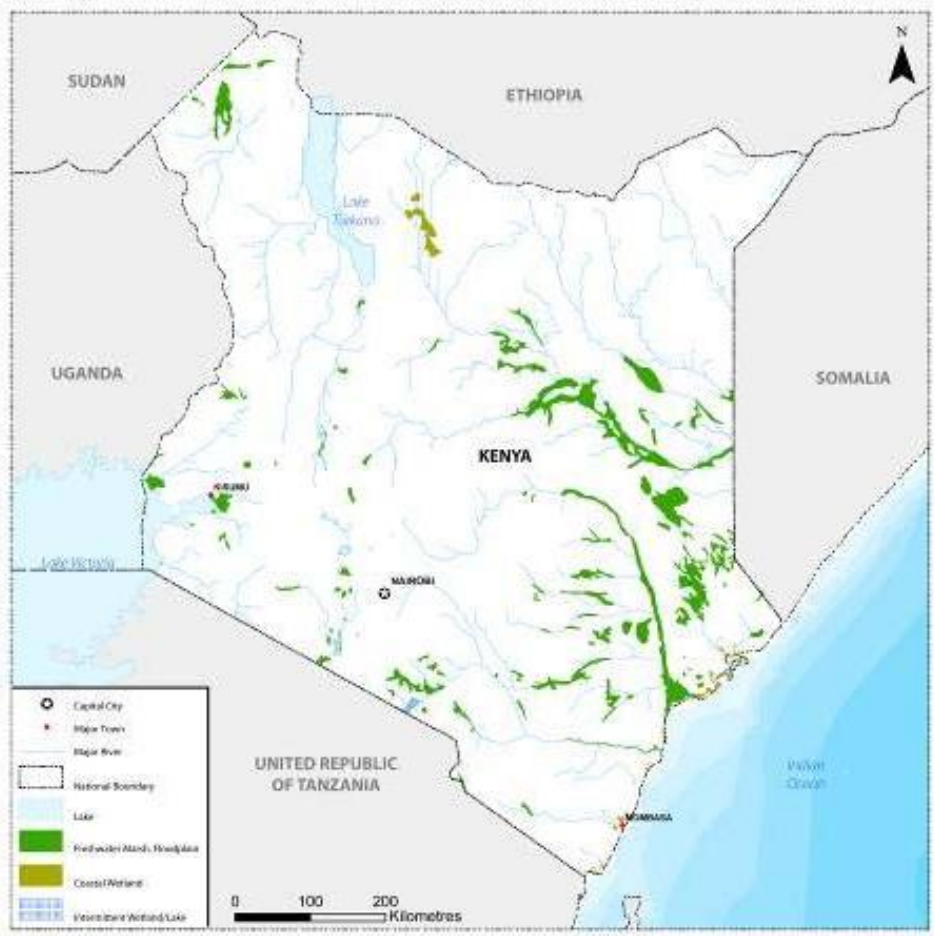

Figure 5: Kenya's Largest Wetlands

They include the shallow lakes Nakuru, Naivasha, Magadi, Kanyaboli, Jipe, Chala, Elmentaita, Baringo, Ol'Bolossat, Amboseli and Kamnarok; the edges of Lake Victoria and Lorian, Saiwa, Yala, Shompole swamps; Lotigipi swamp (Lotagipi) and Kano plains; Kisii valley bottoms and Tana Delta; and coastal wetlands **(**Source: WWF 2005).

4.4.6 Marine and Coastal Areas

Kenya's marine and coastal environments include the Indian Ocean's territorial waters and the immediate areas that border the ocean. The Kenyan coast stretches 550 kilometers from the Somalian border in the north in a south-westerly direction to the border with Tanzania. The fringing coral reef (comprised of about 140 species of hard and soft corals) runs between 0.5.kmand 2km off-shore with occasional gaps at the mouths of rivers and isolated areas facing creeks. Beaches, cliffs, or mangrove forests dominate the shoreline in most areas. The coral-reef system, mangrove swamps, and hinterland provide unique natural landscapes and a wide range of biodiversity resources of special conservation concern.

4.4.7 Wildlife

Kenya's game parks and spectacular wildlife attract nearly two million tourists each year (UNWater2006)and generate important domestic revenues. Wildlife conservation is thus a high priority. Formed in 1946, Nairobi National Park, just outside the city, was the country's first protected area. By 2008, about 75 237.9 km2 (WCPA 2007) of the nation's land area had been set-aside as national parks and game reserves. Wildlife is also protected by bans on game hunting, killing animals even when they attack, and the trade in ivory and skins. Nevertheless, poaching is a significant threat to many species including leopards, cheetahs, lions, elephants, and rhinoceroses. Efforts are being made to restore populations of the endangered African elephant and black rhino, and an aggressive campaign is being been waged against poachers. Moreover, increased pressure on marine resources has led the Kenyan government to establish a system of protected areas managed by the Kenya Wildlife Service (KWS) to conserve and manage the most important ecosystems along the coast. In total, Kenya has five Marine Protected Areas (MPA's).

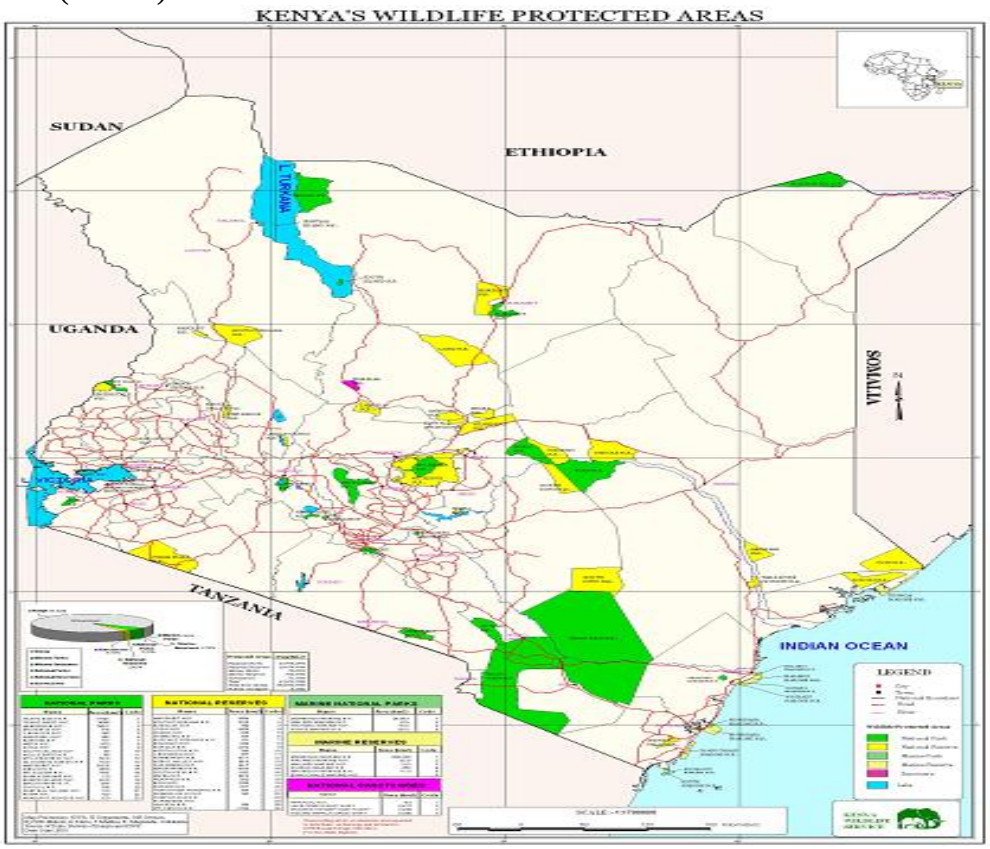

Figure 6: Protected Areas in Kenya

Examples of endangered species include theSokokescops owl (*Otusireneae);* Taita blue-banded papilio *(Papiliodesmonditeita);* the highly endangeredTana River*mangabey (Cercocebusgaleritus)* and the Tana River red colobus *(Piliocolobusrufomitratus);* the green sea turtle *(Cheloniamydas)* and the critically *endangered hawksbill turtle (Eretmochelysimbricata).*

In addition to threats to species biodiversity, a number of types of ecosystems are disappearing or are in dangerous decline due to human activities. These include the slopes of Mount Kenya and coastal forests as well as the Horn of Africa Acacia Savannas, a major centre of endemism for dry land plants.

4.5 Socio-Economic Background

4.5.1 Population

Kenya's population increases by an estimated one million a year. The Government revised population based on the 2009 census is 39.8 million, an increase of over 35 percent in the past decade. The population report shows the distribution of the population across the country, with Rift Valley Province being the most populous with 10.1 million people. Nairobi, the capital, has 3.1 million people, according to the report released by the Ministry of Planning and National Development. Demographic trends show that more people are moving to urban areas and the Bank estimates that half of Kenya's population will live in cities by 2050. Better macro-economic conditions in the past decade helped improve the welfare of Kenyans, but the poor remain vulnerability to drought and other crises induced by climate change.

Rural and urban poverty remain a challenge. Recent analysis of the data from the 2005 to 2006 Kenya Integrated Household Budget Survey (KIHBS) indicates that national absolute poverty declined from 52.3 percent in 1997 to 46.1 percent in 2005 to 2006. While this decline in poverty compares well with other Sub Saharan African countries, it can still be considered high in comparison to neighboring countries such as Tanzania (about 36 percent) and Uganda (about 31 percent). In rural areas, overall poverty declined from 52.9 percent to 49.1 percent, while in urban areas, poverty declined from 49.2 percent in 1997 to 38.8 percent over the same period.

The Kenyan poverty profile also reveals strong regional disparities in the distribution of poverty. According to the 2005 to 2006 survey, the lowest incidence of rural poverty was in Central province (30.3 percent), followed by Nyanza (47.9 percent), Rift Valley (49.7 percent), Eastern (51.1 percent), Western (53.2 percent), Coast (69.7 percent), and North Easter province (74.0 percent). Inequality in Kenya remains high. The distribution of income, measured by the Gini coefficient (a measure of inequality of income distribution—the higher the percentage the higher the level of inequality) was estimated at 39 percent in rural areas and 49 percent for urban areas (pre-crisis). Income disparities in the rural areas have gone down since 1997, while the disparities in the urban areas have increased slightly. The Commission on Revenue Allocation is using the development and poverty data to develop a model for more equitable distribution of public resources.

There has been additional progress with respect to other dimensions of social development over the past years. For example, net primary education enrolment was only 80 percent in 2003, but has since increased to about 90 percent in 2008 (with an equal enrolment ratio between boys and girls). In 2004, only about 60 percent of primary students completed their education compared with about 80 percent in 2008. The

transition from primary to secondary and later to tertiary and university education has also improved in recent years due to increased public and private investment in the education sector.

4.5.2 Economic Growth & Setting

Kenya's economy recorded high growth rates of real Gross Domestic Product (GDP) averaging 6.6% per annum during the immediate post-independence years (1964-1973) and towards the end of that decade. Deceleration of this growth which started in late 1970s, continued until 2002 when the economy registered a record negative growth rate of 0.2%. During the years 1997-2002 economic growth declined steadily with GDP recording an average annual growth rate of only 0.9%, against a population growth rate of 2.9% per annum.

Among the key factors contributing to the economic decline were poor infrastructure, particularly bad roads, inadequate energy supply, inadequate water supply, a weak institutional framework, weak performance of the major sectors of the economy namely; agricultural and manufacturing sectors, and poor macro-economic management. More recently, about 46.6 % of Kenya's population of 35.5 million people in 2005/061 was estimated to be living below the country's poverty line in both rural and urban areas.

Agriculture has performed average despite the moderate drought. Agriculture production grew by 3.5 percent in the second first half of the year as rains normalized, especially in Kenya's "bread basket", the Rift Valley, and production held up again. The drought mostly affected Kenya's livestock production in Northern and Eastern regions. It is estimated that the drought shaved off 0.2 percentage points from GDP growth, mainly as a result of livestock mortality. Beyond these arid regions, low rainfall and high temperatures affected tea production. In addition, the crises in North Africa and Europe adversely affected the demand for Kenya's cash crops, mainly horticulture, coffee and tea.

5 DESCRIPTION OF THE ADMINISTRATIVE, POLICY AND REGULATORY FRAMEWORK

5.1 The Legal, Regulatory and Policy Framework

5.1.1 Constitution of Kenya

Kenya has a new Supreme law in form of the New Constitution which was promulgated on the 27th of August 2010 and which takes supremacy over all aspects of life and activity in the New Republic. The Constitution is the supreme law of the Republic and binds all persons and all State organs at all levels of government. The Constitution of Kenya, 2010 provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.

In relation to the environment, article 42 of chapter four, *The Bill Of Rights*, confers to every person 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 legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the document provides the main pillars on which the 77 environmental statutes are hinged. Part 1 of the chapter dwells on land, outlining the principles informing land policy, land classification as well as land use and property. Of core importance is the definition of private land as land within the project area is largely privately owned, and would be acquired for irrigation purposes. The second part of this chapter directs focus on the environment and natural resources. It provides a clear outline of the state's obligation with respect to the environment, thus; *"The state shall-*

- *Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;*
- *Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;*
- *Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;*
- *Encourage public participation in the management, protection and conservation of the environment;*
- *Protect genetic resources and biological diversity;*
- *Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;*
- *Eliminate processes and activities that are likely to endanger the environment; and*
- *Utilise the environment and natural resources for the benefit of the people of Kenya."*

There are further provisions on enforcement of environmental rights as well as establishment of legislation relating to the environment in accordance to the guidelines provided in this chapter.

In conformity with the Constitution of Kenya, 2010, every activity or project undertaken within the republic must be in tandem with the state's vision for the national environment as well as adherence to the right of every individual to a clean and healthy environment.

Section 69 (2) every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources

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, particularly those contemplated in Article69; and*
b) *To have obligations relating to the environment fulfilled under Article 70*

Section 69 (2) every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.Section 70 provides for enforcement of environmental rights thus:

(1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

(2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate—
a) To prevent, stop or discontinue any act or omission that is harmful to the environment; b) To compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or c) To provide compensation for any victim of a violation of the right to a clean and healthy environment.

(3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

Essentially, the new Constitution has embraced and provided further anchorage to the spirit and letter of EMCA 1999 whose requirements for environmental protection and management have largely informed Sections 69 through to 71 of this document. In Section 72 however, the new constitution allows for enactment of laws towards enforcement of any new provisions of the Supreme Law.

5.1.2 Environmental Management and Coordination Act, 1999

The Environmental Management and Coordination Act of 1999 (EMCA) is anact of Parliament that provides for the establishment of an appropriate legal and institutional framework for the management of the environment. The act allows the cabinet secretary in charge of environment to gazette standards, regulations and guidelines for the proper management, conservation and protection of the environment.

EMCA, 1999 has a general definition of hazardous waste in the Fifth Schedule which describes E-wastes as having five distinct characteristics i.e. explosivity, flammability, oxidizivity, toxicity and corrositivity. The E-waste contains compounds of metals classified as hazardous wastes by virtue of its constituents. Section 5 of the E-waste Management Guidelines requires the E-waste generator to minimize E-waste and eliminate E-waste altogether as well as identifying and eliminating potential negative impacts of the product, enabling the recovery and reuse of the product, reclamation and recycling and incorporating environmental concerns in the design and disposal of a product. Sections 17-23 require the generators of hazardous waste to conduct an EIA and labelled clearly the "hazardous waste". The Designated National Authority uses Basel Convention guidelines, and NEMA over sees the entire transport of such materials.

The EMCA has introduced what is in effect is a parallel system for managing hazardous chemicals and hazardous waste. Section 91 provides the characteristics of hazard. The Act provides that hazardous waste and substances and chemicals shall not be imported into Kenya or exported from Kenya or transported through Kenya without a valid permit issued by the authority (NEMA). Where the E-wastes are being exported from Kenya the written consent of the receiving country must also be obtained. This is a requirement under the Basel Convention on the transboundary movement of hazardous waste, it is a 1989 convention and it imposes a system, which is known as prior informed consent requirement.

The requirement is a requirement that the importing country must give its prior consent before the import is undertaken. The catch is that the consent must be informed and for the consent to be informed the exporting country must disclose the nature of the substance being exported. (Kenya has not ratified the Basel Convention) only 10 African Countries ratified this convention this is because African countries took the view that they will never get informed consent from the developed world and what they give will not be free consent, and even if informed consent is given, it will be too technical they will not understand it. Africans went ahead and signed the Bamako convention, which says that hazardous material cannot be imported into African but they say it can be moved as between the African countries.

Under Section 93 the Act prohibits the discharge of hazardous substances or chemicals into any waters or other segments of the environment. A person who is responsible for the discharge shall pay the cost of removing the substance or chemicals including the cost incurred by the government in restoring the environment which has been damaged.

This is an Act of Parliament providing for the establishment of an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. This Act is divided into 13 Parts, covering main areas of environmental concern as follows: Preliminary (I); General principles (II); Administration (III); Environmental planning (IV); Protection and Conservation of the Environment (V), Environmental impact assessments (EIA), audits and monitoring (VI); Environmental audit and monitoring (VII); Environmental quality standards (VIII); Environmental Restoration orders, Environmental Easements (IX); Inspection, analysis and records (IX); Inspection Analysis and Records (X); International Treaties, Conventions and Agreements (XI) National Environment Tribunal (XII); Environmental Offences (XIII).

Part II of the Environment Management & Coordination Act, 1999 states that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. In order to partly ensure this is achieved, Part VI of the Act directs that any new programme, activity or operation should undergo environmental impact assessment and a report prepared for submission to the National Environmental Management Authority (NEMA), who in turn may issue a license as appropriate. The Act provides for the setting up of the various ESIA Regulations and Guidelines, which are discussed below:

5.1.3 Environmental Impact Assessment and Audit Regulations, 2003.

This regulation provides guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance on the fundamental aspects on which emphasis must be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. The legislation further explains the legal consequences of partial or non-compliance to the provisions of the Act.

5.1.4 The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121

The regulation provides that a waste generator shall use cleaner production methods, segregate waste generated and the waste transporter should be licensed. The notice further states no person shall engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by the National Environment Management Authority. The Environmental Management and Co-ordination (Waste Management) Regulations 2006, is the government's legal instrumentthatdeals with waste management in Kenya. Although there is no direct provision for E-waste, the E-Waste Management Regulations 2006 apply to electronic waste by virtue of their composition, which includes several of the substances listed as hazardous waste.

The Environment Management and Coordination (Controlled Substances) Regulations 2007, deals with management and control of substances thatdeplete the Ozone. However, the regulations provide a list of hazardous substances but do not detail how they should be handled in relation to E-waste management.

5.1.5 *Electronic Waste Management Regulations-Draft*

Kenya has prepared guidelines for E-waste management and in 2013 further completed the development of draft E-waste regulations, which are yet to come into force. Further, the Environmental Management and Coordination (Waste Management Regulations) regulations 2006, may apply to electronic waste where they can be classified as hazardous waste. In 2013, Kenya completed the development of E-waste regulations, which are still considered draft pending official gazzetted before enactment into law. Key highlights of the regulations include among others:

Responsibilities of Generators

The generator shall ensure E-waste is segregated from other forms of waste and is taken to licenced refurbishers, collection centers or recyclers. The project will generate E-Wastes and therefore will be expected to take all the wastes to licenced refurbishers or recyclers.

5.2 Institutional Framework

5.2.1 *Ministry of Environment, Water and Natural Resources*

The Ministry of Environment, Water and Natural Resources (MEWNR) is responsiblefor the environmentat policy level. One of its key functions is the fullimplementation of the Environmental Management Coordination Act (EMCA) 1999 which defines hazardous waste, pollutants and pollution. To achieve this objective, the Ministry's role is to create an enabling environment through policy, legal and regulatory reforms for environmental and natural resources management.

The mandate of the ministry is to monitor, protect, conserve and manage the environment and natural resources through sustainable exploitation for socio-economic development aimed at eradication of poverty, improving living standards and ensuring that a clean environment is sustained now and in the future. The ministry comprises of various divisions at the headquarters and the following parastatals and departments including the National Environment Management Authority.

5.2.2 *National Environment Management Authority-NEMA*

The National Environment Management Authority (NEMA) is the principal instrument of Government in the implementation of all policies relating to the environment. In the NEMA strategic plan 2010-12, key objectives include universal compliance and enforcement of environmental regulations, developing guidelines and standards and the prosecution of offenders failing to meet the provisions of the EMCA1999. The lead agencies that are also pertinent to E-waste management include the Ministry of Information and Communication, Communications Commission of Kenya (CCK), Kenya Bureau of Standards (KEBS), Kenya Revenue Authority (KRA), Ministry of Education.

NEMA is established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment.

Roles and Functions in relation to E-waste

1. Coordinating the various environmental management activities being undertaken by the lead agencies including those related to E-waste management

2. Promote the integration of environmental considerations into development policies, plans, programmes and projects, 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 Kenya. In the context of E-waste, NEMA has the role of ensuring that policies, plans and programs that entail increased uptake of electronics e.g. ICT policies, consider the environmental implication of electronics specifically as a waste after end of life.

3. Carry out surveys, which will assist in the proper management and conservation of the environment. In the context of E-waste, NEMA plays a role of conducting surveys on E-waste including quantities, impacts, challenges, management efforts etc. with a view of assisting in proper management and conservation of the environment

4. Advise Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements. NEMA's role in regard to E-waste and this function is related to the international conventions touching on E-waste namely: Basel and Bamako.

5. Advise the Government on regional and international conventions, treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements.

6. Undertake and coordinate research, investigation and surveys, collect, collate and disseminate information on the findings of such research, investigations or surveys. In the context of E-waste, NEMA has the responsibility of spearheading and coordinating all research, investigations and surveys related to E-waste including dissemination of the findings.

7. Identify projects and programmes for which environmental audit or environmental monitoring must be conducted under this Act.

8. Undertake, in cooperation with relevant lead agencies, programmes intended to enhance environmental education and public awareness, about the need for sound environmental management, as well as for enlisting public support and encouraging the effort made by other entities in that regard.

9. Publish and disseminate manual codes or guidelines relating to environmental management and prevention or abatement of environmental degradation. In the context of E-waste, NEMA has the role of publishing and disseminating the existing E-waste guidelines.

10. Render advice and technical support, where possible, to entities engaged in

natural resources management and environmental protection, so as to enable them to carry out their responsibilities satisfactorily.

11. Prepare and issue an annual report on the State of Environment in Kenya and in this regard, may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency.

5.2.3 Ministry of Health

The Ministry formulates policies that govern waste management in regard to minimizing health impacts. According to the Health Act, waste is a nuisance. It gives guidelines to the County governments on ways and means of dealing with waste. The act also gives County governments the power to prosecute offenders.

5.2.4 Ministry of Information, Communications and Technology

ThemandateoftheMinistryistoformulatepolicyonICTinbroad terms. Under the ministry, there are autonomous bodies such as Communications Commission of Kenya (CCK), which is a regulator in the communications sector, and the Kenya ICT Board, which is tasked with promoting Kenya as an ICT hub, as well as availing cheaper internet bandwidth to the Government, universities and the business process outsourcing sector.

The Ministry of Information, Communication and Technology (MICT) has recognized the potential challenge posed by E-waste and has included a clause in its 2006 policy document that specifically addresses the issue.

The ICT policy promulgated by the then Ministry of Information and Communication and Technology (MICT) in 2006 is cognizant of E-waste and state that " As a prerequisite for grant or renewal of licences, applicants must demonstrate their readiness to minimize the effects of their infrastructure on the environment. This should include provision of appropriate recycling/disposal facilities for waste that may contain toxic substances." While the intention has not been incorporated in ICT regulations to make it binding, the Universal Licensing Framework to be implemented by the CCK from July 1st, 2008 takes a step towards enforcing this statement of intent.

5.2.5 Kenya Bureau of Standards

TheKenyaBureauofStandards (KBS) is an autonomous body under the MTI. It runs the pre-export verification of conformity programme (PVoC). The aim is to minimise the risk to Kenya of unsafe and sub standard goods from entering Kenya through the execution of conformity assessment activities in the country of export. The Bureau is expected to do pre-shipment inspection of second- hand computers to ensure that they are usable. PVoC is a conformity assessment programme based on Article 5 of WTO-TBT agreement, administered by Kenya Bureau of Standards on behalf of the Government, carried out by the appointed KEBS Verification partners on regulated goods in the country of supply. Basis of conformity Assessment To ensure equal national treatment, in line with WTO, all Conformity assessments shall be based on Kenyan technical regulations (i.e. Kenya Standard) where they exist. However, in the absence of Kenyan technical regulations, International Standard or technical regulations applicable in the

country of supply shall apply. Three (3) inspection companies (PVoC Agents) namely; Messrs Bureau Veritas, Intertek International and SociétéGénérale de Surveillance (SGS) have been contracted by KEBS to undertake PVoC activities in the new contract effective from 18th Jan. 2012. The overall objective is to minimize the risk of unsafe and substandard goods entering Kenyan market, thus ensuring health, safety and environmental protection for Kenyans.

5.2.6 Kenya Revenue Authority

Customs and Excise Department implements bilateral, regional and international trade arrangements, and supports global enforcement efforts against smuggling, the illegal importation and exportation of arms, drugs of abuse, etc. as mandated through various international legal instruments.

The Customs and Excise Department, as the agency of government entrusted with the responsibility to monitor and control imports and exports, is responsible for the implementation of the 'trade and customs'clauses of the regional trade agreements. For example, Kenya allows used computers into Kenya but has imposed excise duty at the rate of 25%, and Import Declaration Fees of 25% of cost, (CIF). KRA also through the Customs and Excise Department is responsible for ensuring that E-waste does not get into Kenya from countries other than those that are signatories to the Bamako Convention.

There is need however, for the KRA to play a significant and added role other than checking on E-waste alone since other electronic equipment enter the borders as second hand pieces which may have a very short lifespan and hence in a way are basically E-waste in disguise.KRA, has a critical role of providing accurate statistics and data on electronic equipment imported in the country and in actual fact should be included in any initiative aimed at building a system for reliable data capture on importation of electronic equipment. KRA however lacks adequate capacity to undertake testing at the border posts in order to ascertain and distinguish between E-waste and second hand electronic equipment or new equipment further complicating the issue of E-waste in Kenya.

KRA requires increased capacity building, awareness creation, new regulations and emphasis on green procurement as a strategy to address the E-waste problem in regard to importation of electronic equipment because they have a significant role in regulating imports including stopping the entry of E-wastes from other countries, other than the Bamako countries.

5.3 E-Waste Challenges in Kenya

The Kenyan government has rolled out an e-government programme to promote use of information and communication technology (ICT) in all sectors. The resultant waste from their usage has over the years accumulated, and now poses a threat to the environment.

Kenya lacks an up to date national inventory of E-waste quantities and this presents a general challenge in terms of tackling the management of the same. The determination of and availability of E-waste quantities is a significant step in the overall management of E-waste including investing in E-waste as a sector.

5.4 Sources of E-wastes in Kenya

In Kenya, the sources of E-waste are numerous and highlighted in the **Table 1** below.

Table 1. Sources of E-waste

Sources of Electronic Waste
Government Institutions including the Military Institutions, Ministries and departments, parastatals among others
Private Sector Institutions/Civil Society Organizations (CSOs) including NGOs, CBO, Cooperatives, Banking Sector
General Public
Educational Institutions including public and private universities, colleges, polytechnics,
Health Care Facilities (Public and Private)

5.5 Types of E-wastes in Kenya

The draft Kenya E-waste regulations (2013) has categorized electronic products under the following categories, which in essence lead to generation of E-wastes namely;

Table 2. Electronic Product E-waste Categories

Large Household Appliances
Refrigerators
Freezers
Largecooling appliances
Other large appliancesused forrefrigeration,conservation andstorageoffood
Washing machines
Clothesdryers
Dishwashingmachines
ElectricalCooking equipment
Electricstoves
Electrichotplates
Microwaves
Other large appliancesused forcookingandotherprocessingoffood
Electricheating appliances
Electric radiators
Air conditioner appliance
Other fanning, exhaust ventilation and conditioning equipment
Small Household Appliances
Vacuumcleaners
Carpetsweepers
Scales
Appliancesusedforsewing,knitting,weaving andotherprocessingfortextiles Ironing,mangling andotherclothingappliances.

Otherelectricalappliancesfor cleaning
Toasters
Fryers
Grinders,coffee machines andequipmentfor opening orsealingcontainersor packages
Electricknives
Appliancesforhair-cutting,hair drying,toothbrushing,shaving,massageandotherbodycare appliances
Clocks,watchesandequipmentforthepurposeof measuring,indicatingorregisteringtime
IT and TelecommunicationsEquipment
Centralized data processing: Mainframes; Minicomputers; Servers
Printerunits
PersonalComputing ▪ Personalcomputers(CPU,mouse,screenandkeyboardincluded) ▪ Laptopcomputers(CPU,mouse,screenandkeyboardincluded) ▪ Notebookcomputers ▪ Notepadcomputers
Copying Equipment ▪ Electricalandelectronictypewriters ▪ Pocketanddesk calculatorsandotherproductsandequipmentforthecollection,storage,processing,presentation or communicationof informationbyelectronic means
UserTerminalsand Systems ▪ Facsimile ▪ Telex ▪ Telephones ▪ Paytelephones ▪ Cordlesstelephones ▪ Cellulartelephones ▪ Answering systemsandotherproducts ▪ Broadcasting equipmentfortransmittingsound,images or otherinformationby telecommunications ▪ Andotherproductsor equipmentforthepurpose of recording orreproducing soundorimages,including signalsorothertechnologiesforthedistribution of soundandimagethanbytelecommunications
Consumer Equipment ▪ Radio sets; ▪ Televisionsets; ▪ Video cameras; ▪ Video recorders; ▪ Hi-firecorders; ▪ Audio amplifiers; Musicalinstruments
Lighting Equipment ▪ Luminariesforfluorescentlamps.Straightfluorescentlamps ▪ Compactfluorescentlamps ▪ High intensitydischargelamps,includingpressuresodiumlampsandmetalhalidelamps ▪ Lowpressuresodium lamps ▪ Otherlighting orequipmentforthepurposeof spreading orcontrollinglight
Electrical andElectronic Tools ▪ Drills ▪ Saws

▪ Sewingmachines ▪ Equipmentforturning,milling,sanding,grinding,sawing,cutting,shearing,drilling,making holes, punching,folding,bending orsimilarprocessing ofwood,metaland othermaterials ▪ Toolsforriveting,nailingor screwing or removing rivets,nails,screwsorsimilaruses ▪ Toolsforwelding,soldering or similaruse ▪ Equipmentforspraying,spreading,dispersingorothertreatmentofliquid or gaseoussubstancesbyother means ▪ Toolsformowing or othergardeningactivities
Toys, leisure and sports equipment ▪ Electrictrainsorcarracing sets ▪ Hand-heldvideo gameconsoles ▪ Video games ▪ Computersforbiking,diving,running,rowing,andothersimilargadgets. ▪ Sportsequipmentwith electricorelectroniccomponents ▪ Coin slotmachines
Medical devices (with the exceptionofall implanted and infectedproducts) ▪ Radiotherapyequipment ▪ Cardiology ▪ Dialysis ▪ Pulmonaryventilators ▪ Nuclearmedicine ▪ Laboratoryequipmentfor in-vitrodiagnosis ▪ Analysers ▪ Freezers ▪ Otherappliancesfordetecting,preventing,monitoring,treating,alleviating illness,injuryor disability
Monitoring andcontrol instruments ▪ Smokedetector ▪ Heating regulators ▪ Thermostats ▪ Measuring,weighingor adjusting appliancesfor householdoraslaboratoryequipment ▪ Othermonitoring andcontrolinstrumentsused in industrialinstallations
Automatic dispensers ▪ Automaticdispensersfor hotdrinks ▪ Automaticdispensersfor hotor coldbottlesorcans ▪ Automaticdispensersforsolidproducts ▪ Automaticdispensersfor money
Security and Military Equipment
Florescenttubes
Batteries

Source: Draft E-waste regulations, 2013

According to a study conducted by UNEP in 2009, it was estimated that the current E-waste generated annually in Kenya was 11,400 tonnes from refrigerators, 2,800 tonnes from TVs, 2,500 tonnes from personal computers, 500 tonnes from printers and 150 tonnes from mobile phones (UNEP & UNU, 2009). This is old data and it is envisaged

that the quantities of E-wastes has increased since this time therefore making a case for and justification to conduct a new inventory.

A mass flow study carried out in 2007 by Kenya ICT Action Network showed that: 1,513 tons of electronics entered the Kenya market. The consumer in addition to receiving 1,489.4 tons from the formal market,also received 151.3 tons from the second hand market. Other sources also indicate that Kenya has reached a mobile penetration rate of more than 63% and an internet penetration of more than 18.6%. The number of internet users in (2007) was estimated at 10.2 million.

The number of ICT companies along the sector increased to more than 4000 companies. Moreover, many shops and kiosks also resell ICT related services; especially services and products relating to the mobile phone. ICT is being extensively used in the education, health, industrial, trade and communication sectors. Private sector has been installing heavy computing equipment and data centers, mainly mobile operators, banks, and Manufacturing sector companies. From statistics, the consumers are likely to:

- Dispose of 1,210.4 tons in the second-hand market;
- Dispose of 18.6 tons to collectors or to be refurbished;
- Dispose of 18.6 tons directly to recyclers.

According to National Environment Management Authority, each year the country generates 3,000 tons of electronic waste. This number raises doubts on the accuracy of and prediction or estimation of E-waste due to the fact that if 3,000 tons are generated annually, it follows that an almost similar amount of E-waste should be disposed. This anomaly points to the critical need to undertake an accurate inventory of E-waste to date in Kenya and further design methodologies for estimating or ascertaining E-wastes generated and disposed on an annual basis.

6 DESCRIPTION OF WORLD BANK ENVIRONMENTAL & SOCIAL SAFEGUARDS POLICIES AND TRIGGERS

Table 3 below shows the Banks safeguards policies in general and highlights the specific safeguards that are triggered as a result of the proposedproject.

Table 3: Summary of World Bank's Safeguards Policies objectives including when they are triggered

Policy	Objective	Trigger for the Policy
OP/BP 4.01 Environmental Assessment	The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts on its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and transboundary and global environment concerns.	Depending on the project, and nature of impacts a range of instruments can be used: EIA, environmental audit, hazard or risk assessment and environmental management plan (EMP) when a project is likely to have sectoral or regional impacts, sectoral or regional EA is required. The Borrower is responsible for carrying out the ESIA. The GPE Project will not require preparation of ESIA instead an E-Waste Management/Disposal Plan will be prepared for management of E-Wastes generated from electronic gadgets provided to schools.
OP/BP 4.10 Indigenous Peoples	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate and gender and inter-generationally inclusive social and economic benefits. The policy requires free, prior and informed consultation with indigenous peoples.	The policy is triggered when the project affects the indigenous peoples (with characteristics described in OP 4.10 para 4) in the project area. The GPE Project triggers this policy because of the fact that in certain locations where the project will be implemented are known to have communities categorized as vulnerable and marginalized.

6.1.1 Environmental Assessment (OP4.01)

This policy requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision-making. The EA is a process whose breadth, depth, and type of analysis will depend on the nature, scale, and potential environmental impact of the proposed projects under the GPE.

The adverse environmental and social impacts under GPE will come from procurement of electronic devices specifically tablets and smartphones for use in schools. However, since the exact location of most of these investments have not be identified, the Banks' EA policy calls for the GOK to prepare an Environmental and Social Management Framework (ESMF) in accordance with its' procedures.

OP4.01 is triggered because the GPE will finance purchase of devices that are likely to have adverse environmental and social impacts and in effect GPE is a **category B partial** project. This ESMF establishes a mechanism to determine and assess future potential environmental and social impacts during implementation of project activities, and sets out mitigation, monitoring and institutional measures to be taken during operations of these activities, to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

In regard to disclosure of the ESMF report, World Bank requires that the report be disclosed as a separate document as a condition for Bank appraisal. This report will be disclosed to the general public to meet this requirement as well as the Infoshop of the World Bank and the date of disclosure will precede the date for appraisal of the program.

The extent and type of environmental and social assessment required by the World Bank is a function of the project's environmental impact and hence, its environmental screening category. The World Bank undertakes environmental and social screening of each proposed subproject to determine the appropriate extent and type of environmental and social assessment. The World Bank classifies projects into one of three categories (A, B and C), depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

Table 4. World Bank EA Screening Categories

Category "A"	An EIA is always required for projects that are in this category. Impacts are expected to be 'adverse, sensitive, irreversible and diverse with attributes such as pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbance of the site or surroundings; extraction, consumption or conversion of substantial amounts of forests and other natural resources; measurable modification of hydrological cycles; use of hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances.
Category B	When the subproject's adverse environmental impacts on human populations or environmentally important areas (including wetlands, forests, grasslands, and other natural habitats) are less adverse than those of Category A subprojects. Impacts are site – specific; few, if any, of the impacts are irreversible; and in most cases, mitigation measures can be designed more readily than for Category A subprojects. The scope of environmental assessment for a Category B subproject may vary from sub-project to sub-project, but it is narrower than that of a Category A sub-project. It examines the subproject's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
Category C	If the subproject is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C sub-project.

6.2 Requirements for Public Consultation and Disclosure

As part of the preparation of this ESMF, a series of consultations were held with different stakeholders relevant to the project. Consultations were held with officials from the Ministry of Education, Science and Technology, Kenya National Examination Council, Teachers Service Comission as well as with head teachers and teachers as well as parents of children from schools in Kajiado, Narok Nakuru, Njoro and West Pokot Counties. In general, those consulted were happy with the project and did not see any adverse impacts that the project would have on the environment. The results of the consultations were incorporated in the final ESMF document. The list of those consulted, the minutes and photographs are included as an annex in this document.

This ESMF will be disclosed in country through posting on the websites of Ministry of Education, Science and Technology (MoEST) as well as in the Bank's infoshop. Other means of disclosure include providing hard copies of the ESMF in all the Counties that will be affected by the project as well as Sub County offices specifically to ensure that those with no access to internet connectivity can get this document.

7 DETERMINATION OF POTENTIAL ENVIRONMENT AND SOCIAL IMPACTS

This chapter analyses the potential positive (beneficial) and negative (adverse) environmental consequences of the project.

7.1 Positive Impacts

- 6 million pupils in grade 1 and 2 who will benefit from improved early grade mathematics textbooks
- 40,000 teachers will benefit from new methodologies of early grade mathematics instruction through improved in-service training and regular pedagogical supervision and support
- 1.3 million pupils in participating schools will benefit from more effective and present teachers as well as improved teaching-learning inputs;
- Head teachers and Boards of Management (BoMs) who will receive guidance and support in school improvement planning and be empowered to implement plans to improve their school performance
- Parents and communities' aspirations will be met through greater information and enhanced voice in school management for improving quality of education.
- Education system administrators will benefit from improved information and accountability through up to date EMIS data and school audit; and

The project has special focus on developing foundational skills in numeracy at early age to enable students to continue successfully their educational path, to be fit for jobs, to be competitive in the labor market, employed and integrated into the economy. The ultimate outcome is improved livelihood especially of the disadvantaged groups of the population. The Project has a strong emphasis on strengthening governance and management systems at the national and school levels, which align with the CPS priorities on linking social accountability with enhanced development outcomes. The CPS highlights the World Bank's support to Kenya in roll-out of basic transparency and citizen participation mechanism in planning, budgeting, and performance management.

7.2 Potential Adverse Impacts

The potential adverse environmental and social impacts of poor handling of E-Waste are highlighted below.

7.3 Adverse Environmental Impacts

7.3.1 AirPollution

The improper disposal of E-waste through incineration is likely to lead to atmospheric pollution through the release of toxic and noxious gases in the atmosphere. The informal sector's recycling practices magnify health risks. For example, primary and secondary

exposure to toxic metals, such as lead, results mainly from open-air burning used to retrieve valuable components such as gold. Combustion from burning e-waste creates fine particulate matter, which is linked to pulmonary and cardiovascular disease.

7.3.2 *Wastemanagementproblemofnon-biodegradableequipment*

Most of the components of electronic devices are not biodegradable and hence provides a challenge in terms of disposal. Non-biodegradable equipment often remain in the environment for years and end up becoming a menace, eye sore as well as a landscape and visual intrusion problem.

7.3.3 *ToxicityandradioactivenatureofE-wastetothehuman,water,soilandanimals*

Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully. While some naturally occurring substances are harmless in nature, their use in the manufacture of electronic equipment often results in compounds, which are hazardous (e.g. chromium becomes chromium VI). Lead, mercury, cadmium, and polybrominated flame retardants are found in electronic equipment and are all persistent, bio-accumulative toxins (PBTs). They can create environmental and health risks when computers aremanufactured, incinerated, landfilled or melted during recycling.PBTs, in particular are a dangerous class of chemicals that linger inthe environment and accumulate in living tissues.And because they increase in concentration as they move up thefood chain, PBTs can reach dangerous levels in living organisms,even when released in minute quantities.PBTs are harmful to human health and the environment and havebeen associated with cancer, nerve damage and reproductivedisorders.The following list gives a selection of the mostly found toxic substances in E-waste.

Table 5. Toxic Substances in E-waste

Substance	Occurrence in E-waste
Halogenated compounds	
PCB (polychlorinated biphenyls)	Condensers, Transformers
TBBA (tetrabromo-bisphenol-A) PBB (polybrominated biphenyls) PBDE (polybrominateddiphenyl ethers)	Fire retardants for plastics (thermoplastic components, cable insulation) TBBA is presently the most widely used flame retardant in printed
Chlorofluorocarbon (CFC)	Cooling unit, Insulation foam
PVC (polyvinyl chloride)	Cable insulation
Heavy metals and other metals:	
Arsenic	Small quantities in the form of gallium arsenide within light emitting diodes
Barium	Getters in CRT
Beryllium	Power supply boxes which contain silicon controlled rectifiers and x-ray lenses
Cadmium	Rechargeable NiCd-batteries, fluorescent layer (CRT screens), printer inks and toners, photocopying-machines (printer drums)
Chromium VI	Data tapes, floppy-disks
Lead	CRT screens, batteries, printed wiring boards
Lithium	Li-batteries
Mercury	Fluorescent lamps that provide backlighting in LCDs, in some alkaline batteries and mercury wetted switches

Nickel	Rechargeable NiCd-batteries or NiMH-batteries, electron gun in CRT
Rare Earth elements (Yttrium, Europium)	Fluorescent layer (CRT-screen)
Selenium	Older photocopying-machines (photo drums)
Zinc sulphide	Interior of CRT screens, mixed with rare earth metals

Arsenic

Arsenic is a poisonous metallic element, which is present in dust and soluble substances. Chronic exposure to arsenic can lead to various diseases of the skin and decrease nerve conduction velocity. Chronic exposure to arsenic can also cause lung cancer and canoften be fatal.

Barium

Barium is a metallic element that is used in sparkplugs, fluorescent lamps and "getters" in vacuum tubes. Being highly unstable in the pure form, it forms poisonous oxides when in contact with air. Short-term exposure to barium could lead to brain swelling, muscle weakness, damage to the heart, liver and spleen. Animal studies reveal increased blood pressure and changes in the heart from ingesting barium over a long period of time. The long-term effects of chronic barium exposure to human beings are still not known due to lack of data on the effects.

Beryllium

Beryllium has recently been classified as a human carcinogen because exposure to it can cause lung cancer. The primary health concern is inhalation of beryllium dust, fume or mist. Workers who are constantly exposed to beryllium, even in small amounts, and who become sensitized to it can develop what is known as Chronic Beryllium Disease (beryllicosis), a disease that primarily affects the lungs. Exposure to beryllium also causes a form of skin disease that is characterized by poor wound healing and wart-like bumps. Studies have shown that people can still develop beryllium diseases even many years following the last exposure.

Brominated flame retardants (BFRs)

The 3 main types of BFRS used in electronic and electrical appliances are Polybrominated biphenyl (PBB), Polybrominateddiphenyl ether (PBDE) and Tetrabromobisphenol - A (TBBPA).Flame-retardants make materials, especially plastics and textiles, more flame resistant. They have been found in indoor dust and air through migration and evaporation from plastics. Combustion of halogenated case material and printed wiring boards at lower temperatures releases toxic emissions including dioxins, which can lead to severe hormonal disorders. Major electronic manufacturers have begun to phase out brominated flame-retardants because of their toxicity.

Cadmium

Cadmium components may have serious impacts on the kidneys. Cadmium is adsorbed through respiration but is also taken up with food. Due to the long half-life in the body, cadmium can easily be accumulated in amounts that cause symptoms of poisoning. Cadmium shows a danger of cumulative effects in the environment due to its acute and

chronic toxicity. Acute exposure to cadmium fumes causes flu-like symptoms of weakness, fever, headache, chills, and sweating and muscular pain. The primary health risks of long-term exposure are lung cancer and kidney damage. Cadmium also is believed to cause pulmonary emphysema and bone disease (osteomalacia and osteoporosis).

CFCs (Chlorofluorocarbons)

Chlorofluorocarbons are compounds composed of carbon, fluorine, chlorine, and sometimes hydrogen. Used mainly in cooling units and insulation foam, they have been phased out because when released into the atmosphere, they accumulate in the stratosphere and have a deleterious effect on the ozone layer. This results in increased incidence of skin cancer in humans and in genetic damage in many organisms.

Chromium

Chromium and its oxides are widely used because of their high conductivity and anti corrosive properties. While some forms of chromium are non toxic, Chromium (VI) is easily absorbed in the human body and can produce various toxic effects within cells. Most chromium (VI) compounds are irritating to eyes, skin and mucous membranes. Chronic exposure to chromium (VI) compounds can cause permanent eye injury, unless properly treated. Chromium VI may also cause DNA damage.

Dioxins

Dioxins and furans are a family of chemicals comprising 75 different types of dioxin compounds and 135 related compounds known as furans. Dioxins□ is taken to mean the family of compounds comprising polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Dioxins have never been intentionally manufactured, but form as unwanted by-products in the manufacture of substances like some pesticides as well as during combustion. Dioxins are known to be highly toxic to animals and humans because they bio-accumulate in the body and can lead to malformations of the foetus, decreased reproduction and growth rates and cause impairment of the immune system among other things. The best-known and most toxic dioxin is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).

Lead

Lead is the fifth most widely used metal after iron, aluminium, copper and zinc. It is commonly used in the electrical and electronics industry in solder, lead-acid batteries, electronic components, cable sheathing, in the glass of CRTs etc. Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma or even death. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys. It is particularly dangerous for young children because it can damage nervous connections and cause blood and brain disorders.

Mercury

Mercury is one of the most toxic yet widely used metals in the production of electrical

and electronic applications. It is a toxic heavy metal that bio-accumulates causing brain and liver damage if ingested or inhaled. In electronics and electrical appliances, mercury is highly concentrated in batteries, some switches and thermostats, and fluorescent lamps.

Polychlorinated biphenyls (PCBs)
Polychlorinated biphenyls (PCBs) are a class of organic compounds use in a variety of applications, including dielectric fluids for capacitors and transformers, heat transferfluids and as additives in adhesives and plastics. PCBs have been shown to cause cancer in animals. PCBs have also been shown to cause a number of serious non-cancer health effects in animals, including effects on the immune system, reproductive system, nervous system, endocrine system and other health effects. PCBs are persistent contaminants in the environment. Due to the high lipid solubility and slow metabolism rate of these chemicals, PCBs accumulate in the fat-rich tissues of almost all organisms (bioaccumulation).

Polyvinyl chloride (PVC)
Polyvinyl chloride (PVC) is the most widely used plastic, used in everyday electronics and appliances, household items, pipes, upholstery etc. PVC is hazardous because contains up to 56 percent chlorine which when burned produces large quantities of hydrogen chloride gas, which combines with water to form hydrochloric acid and is dangerous because when inhaled, leads to respiratory problems.

Selenium
Exposure to high concentrations of selenium compounds cause selenosis. The major signs of selenosis are hair loss; nail brittleness, and neurological abnormalities (such as numbness and other odd sensations in the extremities).

7.4 Adverse Social Impacts

7.4.1 E-wasteaffectspeople'shealth(e.g.leadpoisoningandcancerousmercury).

Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully. While some naturally occurring substances are harmless in nature, their use in the manufacture of electronic equipment often results in compounds, which are hazardous (e.g. chromium becomes chromium VI). **See Section 7.3.3**

7.4.2 Growthofinformalwastedisposalcentresintheneighbourhood

Improper and indiscriminate disposal of E-waste is likely to lead to the mushrooming of informal waste disposal centers in neighbourhoods which further exacerbates the problem of E-waste where informal E-waste handlers, refurbishers or recyclers are exposed to the adverse health impacts of E-wastes as a result of lack of personal protective equipment and skills to dismantle the wastes.

7.4.3 InformaltradeandManagementofE-waste

Poor E-waste management leads to the establishment of informal trade and management of E-waste and hence presents the overall objective of E-waste management, which

requires a formal and structures system to mitigate associate environmental and health risks.

7.5 E-Waste Mitigation Measure and Management/Disposal Plan

This ESMF contains potential mitigation measures through which the adverse impacts associated with E-Waste emanating from this project can be managed.The mitigation measures or guidelines have been designed in order to avoid, minimize and reduce negative environmental and social impacts at the project level. The mitigation measures are presented in the following tables in a descriptive format.

7.5.1 Procurement of Electronic Gadgets from Credible Manufacturers

The project will as a mitigation measure ensure that all electronic devices are procured from manufacturers that are credible and that all devices will have a clear date of manufacture and warranty. This will avoid procurement of refurbished or used second hand electronic devises with a shorter shelf life a common problem that leads to generation of E-waste as a result of obsoleteness.

7.5.2 Awareness and Sensitization

Awareness and sensitization of teachers who will use the electronic devices on the proper disposal of once they become obsolete. The schools should include in the sensitization the usefulness and significance of E-waste recycling, and the need for returning back all obsolete electronic devices procured by the project to the collection centre that will be established in each school.

7.5.3 Take Back Scheme

All schools benefiting from the electronic devices over the life of the project will be required to establish a collection centre where all the E-wastes are deposited before they are transferred to Nairobi for recycling. All those provided with the devices will not be provided with a replacement of a new device until the obsolete devices are returned back.

7.5.4 Recycling

All the E-wastes generated from will be taken to Nairobi where there is a facility that recycles E-waste at no cost. The East African Compliant Recycling Company is operating Kenya's first E-waste recycling facility, operating to international health, safety and environmental standards and establishing a local, sustainable IT E-waste recycling industry.

The East Africa Compliant Recycling was designed as a scalable model for E-waste recycling. It was established in Mombasa in October 2011 as a pilot project with funding from HP. The EACR is the first facility of its kind in East Africa to test a practical approach to E-waste recycling. The objectives behind its establishment were to:

- Analyze and measure volumes of E-waste returned
- Establish the process to safely separate the products into parts
- Identify facilities and markets to process all the resulting dismantled materials

Since beginning official operations, the EACR remains the only recycling facility in Kenya to accept, dismantle and separate all E-waste components and not just the valuable resources. Plastics, glass, batteries - everything - are all disposed in accordance with the highest international criteria while generating local income and employment opportunities. Until now, the facility receives end-of-life IT from business and public sector customers, as well as from the informal sector for recycling.EACR facility offers its workers advice on handling E-waste containing hazardous materials such as lead and cadmium.

7.6 Monitoring Plans and Indicators

7.6.1 Monitoring of Environmental and Social Indicators

The goal of monitoring is to measure the success rate of the project, determine whether interventions have resulted in dealing with negative impacts, whether further interventions are needed or monitoring is to be extended in some areas. Monitoring indicators will be very much dependent on specific project contexts.

Monitoring

The Ministry of Environmentthrough National Environment Management Authority (NEMA) and the other relevant government agencies implementing this project will be responsible for overall monitoring and evaluation.

The results of the monitoring reportswill be submitted to the Bank. In appreciation of the fact that it would be impossible to visit or monitor all project investments to be financedunder the project, "spot checks" may be undertaken by external consultants but no investment will be ignored in this high level monitoring.

Bank's Monitoring Support

The Bank will provide second line of monitoring compliance and commitments made in the E-Waste Management Plans through supervision. The bank will further undertake monitoring during its scheduled project supervision missions.

Specifically, for each year that the agreement is in effect, MoESTwill be required to submit all the monitoring reports to the Bank as part of its reporting and the Bank supervision missions will review these reports and provide feedback.

7.7 Issues Related to Vulnerable and Marginalized Groups,

The GPE Project triggers one other safeguard policy, alongside OP. 4.01 and this is the OP. 4.10 and the required safeguard instrument (VMGF)has been prepared.

7.8 Monitoring Roles and Responsibilities

7.8.1 Ministry ofEducation, Science and Technology

The Ministry of Planning and Development will provide overall responsibility for the GOK cooperation on this program and remain the World Bank's principal client for the delivery of the program.

7.8.2 Project Steering Committee

MoESTwill establish a Project Implementation Unit (PIU) to provide overall strategic guidance for the program. The mandate, membership and roles and responsibilities of the PIU will be agreed with the MoEST. In addition inter-agency mechanisms will be put in place to ensure effective government coordination on the different program components. Part of its role will be to prepare periodic (monthly, quarterly and annual) monitoring reports for submission to the MoEST, which will submit the reports to the Bank.

7.8.3 Schools

The schools that will be provided electronic gadgets will be responsible for ensuring that the mitigation measures outlined in E-waste management plans are followed and will provide quarterly reports to the PIU on the status of implementation of the plans.

7.8.4 National EnvironmentManagement Authority

The National Environment Management Authority is charged with the responsibility of protecting Kenya's environment including enforcement and monitoring. In this program, through the County Environmental Offices, NEMA staff will monitor and ensure that the E-waste disposal and management plans for schools engaged in this project is followed.

Table 6. E-Waste Management/Disposal Plan

Issue: Procurement and provision of Electronic Devices (laptops, smartphones and tablets to 6,000 schools)				
Impact	**Mitigation**	**Monitoring**	**Responsibility**	**Budget (USD)**
Air Pollution through improper disposal which leads to release of toxic, hazardous and carcinogenic gaseous	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Establish E-Waste Collection Centres in all schools; including collection bins/receptacles; Transport all E-	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Number of	MoEST, Individual Schools and NEMA	30,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.

	wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	awareness and training conducted for users of electronic devices on E-waste Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the GPE program have been successfully disposed		
Human Health Impacts due to poor disposal. Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Establish E-Waste Collection Centres in all schools; including collection bins/receptacles; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Number of awareness and training conducted for users of electronic devices on E-waste Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the GPE program have been successfully disposed	MoEST, Individual Schools and NEMA	30,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.
Pollutionof land resources including landfills Electrical and electronic equipment contain different hazardous materials,	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with	Warranty for Electronic Devices purchased Credibility of	MoEST, Individual Schools and NEMA	30,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.

which are harmful to human health and the environment if not disposed of carefully.	a short shelf life or already categorised as E-Waste Recycle all E-waste; Establish E-Waste Collection Centres in all schools; including collection bins/receptacles; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Number of awareness and training conducted for users of electronic devices on E-waste Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the GPE program have been successfully disposed		
Pollutionof water bodies Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Establish E-Waste Collection Centres in all schools; including collection bins/receptacles; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Number of awareness and training conducted for users of electronic devices on E-waste Certificate of disposal of E-wastes given by the East African Compliant	MoEST, Individual Schools and NEMA	30,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.

	they engage in best practise for E-waste management.	Recycling Company attesting that E-waste from the GPE program have been successfully disposed		
Growth of informal E-waste disposal centres. Improper and indiscriminate disposal of E-waste is likely to lead to the mushrooming of informal waste disposal centers in neighbourhoods which further exacerbates the problem of E-waste	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Establish E-Waste Collection Centres in all schools; including collection bins/receptacles; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Number of awareness and training conducted for users of electronic devices on E-waste Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the GPE program have been successfully disposed	MoEST, Individual Schools and NEMA	40,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.

8 CAPACITY BUILDING, TRAINING & TECHNICAL ASSISTANCE

8.1 Implementation/Management Capacity for Developing E-Waste Disposal/Management Plans

8.1.1 Management Capacity for Safeguards-MoEST/Schools

ThisESMF noted the limited capacity of MoEST and the schools that will receive the electronic devices to prepare management plans for addressing the E-waste problem. However, the ESMF includes a generic management plan, which can be adopted and implemented by schools without detailed variation. Unless otherwise and in special cases, this ESMF does not foresee the need for contracting environmental experts to prepare specific management plans.

However, the schools will be required to implement the management plan specifically the activities outlined and for that reason, the ESMF proposes awareness and sensitization through a workshop targeting all those who will be involved in the project in regard to handling the electronic devices so that they can be made aware of the best practises on E-waste management.

8.1.2 National Environment Management Authority

NEMA Kenya has adequate capacity to handle E-waste and has been in the forefront in spearheading the development of E-waste regulations. The regulations have not come into force and this is a challenge in terms of implementation and monitoring capacity. NEMA also lacks adequate staff to monitor all projects in a County due to budgetary constraints that hinder recruitment.

8.1.3 ESMF Disclosure

Bank procedures require the disclosure of this ESMF reports to project affected groups, local NGOs, and the public at large. MoEST will make available copies of the ESMF and E-waste management plans on their website and offices.

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ANNEX A. List of Participants-Provided as Separate Annex

ANNEX B. Stakeholders Consulted

Minutes of Stakeholder consultation meeting at Marioshoni Primary School Elburgon on 13TH August 2014

Present:

1.	John Tuiya	Teacher
2.	Stephen Njala	Member – SMC
3.	Pastor Samuel Serbei	Chairman – SMC
4.	Stephen Kerepei	Member – SMC
5.	Nancy Rono	Member – SMC
6.	Daniel Kipkones	Teacher
7.	Samuel Sitienei	Teacher
8.	Irene Chepkorir	Staff Member
9.	Rose Kipsigei	Head Teacher
10.	Ronald Ndolo	Njoro Quality Assurance Officer
11.	Tito Kodiaga	World Bank Consultant

Introduction

The above meeting was held at the staffroom of Marioshoni Primary school in Elburgon in Njoro sub – county. The meeting began by a word of prayer led by the chairman of the school management committee, Pastor Samuel Serbei. Teacher John Tuiya on behalf of the Head Teacher then requested those present to introduce themselves to the consultant and the quality assurance officer from the District Education Office (D.E.O). The officer from the district office then introduced himself and before inviting the consultant to do the same.

Objective of meeting

The consultant informed the gathered stakeholders of the MOEST and World Bank's planned Mathematics improvement programme in primary schools in the country. He informed them of the genesis of the programme and why the bank and MOEST were intending to implement the programme.

The bank had requested this stakeholder consultative meeting in order to gather views of those present as per its safeguards policies. The meeting was meant to specifically get views from the participants on what impacts if any the intended programme would have on the culture and traditions of the beneficiary community.

The meeting generated diverse views and comments from those gathered a summary of which is on the table below;

COMMENTS/ VIEWS	RESPONSE
Will it benefit the girl-child? We hope it will help in eradicating negative practices affecting the girl child e.g. early marriages and pregnancies and female genital mutilation?	The community and school leadership is best placed to work on eradicating such negative practices.
Apart from Mathematics, can the programme focus on other subjects or component e.g. athletics?	The programme as envisaged now will only concentrate on the Mathematics subject.

Who will fund the teachers and materials expected to come with the roll out of the programme.	The bank will fund the programme.
Where are the teachers expected going to come from?	It is expected that the teachers to augment the staff at present will come from within the members of the community. They will include untrained teachers.
How many schools have been selected for the programme and is Marioshoni Primary one of them?	Slightly over 1000 schools from 14 counties have been selected and yes Marioshoni Primary is one of them.
Will the bank hire the teachers?	No, the school management committee and the DEO are the bodies to interview and hire teachers. The bank will only fund the exercise.
The programme will benefit the community, but can the bank assist in constructing boarding facilities and other amenities? Materials and teachers may be there but our families are at times too poor to even afford food.	This genuine expression is noted and will be relayed to the bank.
Our school is prone to losing girls at an alarming rate. They drop out due to early marriages and pregnancies. Can the programme set aside funds to assist in constructing dormitories for girls especially in class 6 & 7?	The concern and request is noted and will be relayed to the bank.
The programme will benefit the community and will instill better culture in the community.	Noted

Conclusion

The meeting ended with all present agreeing that the programme as set forth would only be of benefit to the community. All who spoke requested the bank to help the school construct boarding facilities in the school. This would reduce cases of defilement of pupils, keep them warm during cold weather as well as reduce FGM practices. The meeting ended with a prayer at 3:30 pm.

Minutes of the GPE stakeholder consultation meeting at Kapkoris Primary School West Pokot County on 15th August 2014

Present;

1) Alexander Okutoyi	Head Teacher
2) Musumba James	Teacher
3) Joseph P. Yaran	Teacher
4) Josephine Kangerep	Teacher
5) Mary C. Kamaina	Teacher
6) Musa Kotong	Teacher
7) Charles K. Lomukee	Teacher
8) Daniel Wakacha	Teacher
9) Samuel M. Krop	B O M
10) Korii William	B O M
11) Hellen Cherotich	B O M
12) William Siatukei Chorian	B O M
13) John Lokiatar	B O M
14) Mary Chemelei	B O M
15) Jackson Korikwang	B O M
16) Amos Riongopus	B O M
17) Gladys Joel	B O M
18) Stephen Dite Loywopa	Deputy Head Teacher
19) Eunice Riamangiro	B O M
20) Matontei K. Meli	Education Officer – Kapenguria
21) Tito Kodiaga	World Bank Consultant

Introduction

The school head teacher as host opened the meeting by requesting Hellen Cherotich to lead the participants in prayer. Thereafter, those present introduced themselves and their designations in the school.

Objective of meeting

The Head Teacher then requested the education officer Mr. Meli to enlighten the stakeholders as to the purpose of calling the meeting. The education officer proceeded to give an over view of the agenda for the meeting before inviting the consultant from the bank to address the participants. The consultant briefed the stakeholders on the programme that the bank through the MOEST was intending to implement. The program's objective was to enhance the skills of lower primary pupils (classes 1 & 2) in the subject of mathematics. The bank intended to provide funding for the program to enable for the hiring of mathematics teaching staff as well as provide instructional materials for the same.

The meeting was convened to get the views of the stakeholders on the effect the programme would have on the community. The main focus of the expected comments and views was to find out if the project would negatively affect the customs and traditions .i.e. the culture of the people of West Pokot. The consultation process is part of the World Bank safeguards policies.

Views and comments

Subsequent to this briefing by the consultant, the participants then had the opportunity to air their views. The table below details the said comments/views;

COMMENTS/ VIEWS	RESPONSE
The Pokot has been a marginalized community; they value education and wish to use this programme as a stage in developing more.	Noted
It would be better if the program was implemented through the entire primary school system, not just class 1 & 2.	Comment was noted and would be relayed to the Bank.
The teacher – pupil ratio in the lower classes is low, there are only 2 teachers in class 1 teaching 102 pupils. More teachers would be appreciated.	The program will fund the hiring of more teachers.
There is need to retrain maths teachers on a regular basis to impact more skills on them, especially when curriculum changes.	Noted
Corruption may result in mediocre teachers during recruitment, can the program curtail this corruption?	Interviews and recruitment will be handled by the DEO and school Board of Management (B O M). It is hoped that these procedures would be above board,
Remuneration to teachers is perceived as poor, will the program enhance this as a motivating factor?	The consultant would relay this concern to the bank.
The rate of poverty is high in the community. Pupils go hungry at times resulting in poor concentration. Could the bank start a school feeding program to complement this?	Recommendation would be made to the bank in regard to this.
Could the program assist in building dormitories and boarding facilities at the school especially for girls? They are disturbed at home, care for the family, have to work, are susceptible to FGM and early marriages and pregnancies. Due to all these the girls can hardly concentrate.	Recommendations would be made to the bank in favour of these concerns.
Motivate girls by for example giving the best performer in national exams from the county a scholarship e.g. to study Mathematics in the U.S.A.	Noted.

Conclusion

The meeting ended with the head teacher informing the education officer that a library was being built hence storage of instructional materials would be taken good care of. A

vote of thanks was made by the deputy head teacher. The participants dispersed after a word of prayer at 12:40 pm.

Meeting held at Kosulol Primary School on 15/8/2014

Present;

▪ Rusina Chepkanan	Head Teacher
▪ Elizabeth Chepchumba	B O M
▪ Stellah Choge	Teacher
▪ Viola Jepchumba	Teacher
▪ Joseph Arumonyang	B O M
▪ Ruth C. Simatwa	Teacher
▪ Beatrice Chebor	Teacher
▪ Samson Korchome	Cook
▪ Benson Moikez	B O M
▪ Philip Loyatum	B O M
▪ Isaya Arumonyang	Teacher
▪ John Longaritom	Teacher
▪ Rose Arile	Teacher
▪ Grace Loyatum	Senior Teacher
▪ William Doywan	Teacher
▪ Benson Loitangura	Parent
▪ Samson Pkiror	Senior Village Elder
▪ Wilson Lokoret	Parent
▪ Francisca Wakoli	Teacher
▪ Polyne C Alisoreng	B O M
▪ Monica Longarkupowi	B O M
▪ Longolereng Lomuria	Parent
▪ Loriono Tukei	Parent
▪ Wilson Longortum	B O M
▪ Miriam Arupe	Teacher
▪ Veronica Lingareng	B O M
▪ Mnangat Philip	Deputy Head Teacher
▪ John Kasotot	B O M Chair person
▪ Sarah Loyatum	B O M Sponsor
▪ Daniel Lokukai	Chief Lokukai
▪ Priscillah Chelimo	B O M

Introduction

The above meeting was held at the staffroom of Kosulol Primary school in Chepareria in West Pokot County. The meeting began at 2:00 PM by a word of prayer led by the Head Mistress of the school Madame Rusina Chepkanan. The participants were then requested to introduce themselves to the consultant and the officer from the District Education Office (D.E.O). The officer from the district office then introduced himself and before inviting the consultant to do the same.

Objective of meeting

The consultant informed the gathered stakeholders of the MOEST and World Bank's planned Mathematics improvement programme in primary schools in the country. He

informed them of the genesis of the programme and why the bank and MOEST were intending to implement the programme.
The bank had requested this stakeholder consultative meeting in order to gather views of those present as per its safeguards policies. The meeting was meant to specifically get views from the participants on what impacts if any the intended programme would have on the culture and traditions of the beneficiary community.
The meeting generated diverse views and comments from those gathered a summary of which is on the table below;

COMMENTS/VIEWS	RESPONSE
HIV/AIDS is affecting the community leading to a rise in child-headed families. This affects the quality of education. Can the bank assist in raising awareness?	The consultant will recommend this suggestion to the bank.
Child abuse is rife in the area due to parental neglect. This has also affected the standards of education.	Parents should be mindful of their children's welfare.
FGM is still being practiced widely in the community; this leads to early marriages and thus drop – out from school. Will the programme assist in curbing this?	It is the community and administrators duty to curb this culture.
Why not start the programme from nursery/pre unit and up to class 3? It would give a much firmer foundation.	Suggestion is noted and will be relayed to the bank and MOEST.
There is a shortage of teachers leading to compromise in teaching standards. The program's initiative to fund the hiring of teachers is most welcome. We support it wholly.	The appreciation is noted.
We would request that mathematics teachers undergo regular trainings to enhance their capacity.	Noted, will relay this recommendation.
Can the programme also include English and Kiswahili since these languages are the ones used for teaching?	Suggestion is noted and will be relayed to the bank and MOEST.
Initiative is good and highly supported, but can a school feeding program be added also? Poverty is rife leading to hunger which makes concentration in class difficult.	Suggestion is noted and will be relayed to the bank.
The school has a library and adequate space to store instructional material.	Noted.

Conclusion

All the stakeholders present expressed the strong opinion that the program as intended would be of positive benefit to the community. The stakeholders were unanimous that the program would not negatively impact on their cultures and traditions in any way. The

participants resolved to support the program wholly once it is rolled out. The meeting concluded with a vote of thanks by the school board of management chairperson and a closing prayer from Madame Sarah Loyatum. The stakeholders then dispersed at 3:45 pm.

Minutes of the Stakeholder consultation held at Neswit Primary School in Njoro on 13TH August 2014.

Present.

▪ Julius L. Sangogo	Head Teacher
▪ Veronicah Maiywa	Deputy Head Teacher
▪ Christopher Kipkones	Chairman – SMC
▪ Nixon Miangari	Member – SMC
▪ William Tororei	Member – SMC
▪ Jane Rotich	Teacher
▪ Roselyn Mose	Member – SMC
▪ John Sayaya	Member – SMC
▪ Joseph Serseri	Member – SMC
▪ Ronald Mbogo	Njoro Sub-County Quality Assurance Officer
▪ Tito Kodiaga	World Bank Consultant

Introduction

The commenced at 11:30 pm with a prayer led by the deputy Head Mistress of the school. There then followed a moment of self – introduction which allowed all stakeholders present to be familiar with each other.

Purpose

The Njoro sub-county Quality Assurance Officer then introduced the Consultant and requested him to state the purpose of convening the gathering. This, the consultant did by giving an overview of the World Bank.

He stated that the bank was in the process of extending a grant to the Ministry of Education, Science and Technology. This grant was intended to be used for the purpose of improving the standards of Mathematics in Primary schools in Kenya. The programme would specifically target the lower primary classes i.e. Classes 1 and 2 before being extended to upper primary. It has been noted that being a foundation stage of the learning process, emphasis should be put to ensure that pupils received sufficient input.

The Bank intends to enhance the teaching of Mathematics by supplying instructional materials e.g. books and charts as well as improve teacher – pupil ratio by funding the employment of Mathematics teachers in the schools where they are few.

The participants were informed that the programme will focus on 14 counties in the country with slightly over 1000 schools to benefit.

The bank as per its safeguards policies has commissioned the stakeholder consultation to get the views on what impacts the programme may have on the potential beneficiary communities. The bank wished to find out whether the programme as envisaged would have any impacts on the cultures of the beneficiary communities; would the programme erode the language, social interactions of the communities or in any way affect the indigenous lifestyles negatively?

The stakeholders gave their views and comments as below;

COMMENTS	RESPONSE
Education is key to life. The Head Teacher appreciated that his school was being considered for the programme. He noted that without education, he would not be a school head now. He felt the programme as intended would not affect the culture and tradition of the Ogiek community of which he belongs negatively.	The remarks were duly noted.
The school management committee (SMC) noted that some of the existing traditions are archaic, citing Female Genital Mutilation (FGM). He expressed hope that with proper education, such traditions could be eradicated.	These remarks were well noted.
The consultant inquired as to whether the programme would affect the indigenous Ogiek language?	The stakeholders were unanimous in the opinion that the project would not affect their indigenous language. Pupils were taught using English and Swahili language at school only since teachers and the pupils are also from diverse communities. At home they use their mother-tongue so there was no fear of loss of indigenous language.
Are there other potential benefits?	The project may bring in new skills that would help the community enhance their bee-keeping abilities as well as conservation of forests.
The school is short of teachers, would the programme assist in bringing more?	The programme as envisaged hopes to get teachers for Mathematics at lower primary. The consultant will relay the message and recommend the bank to assist in hiring teachers for other subjects.

The Head Teacher requests the bank to assist in the building of a library in the school.	The request will be relayed to the bank by the consultant.
Will the teachers expected to be brought by the program be full time or will they be there for a short time only?	The programme intends to fund the teachers on a full time basis.

The school management committee requests that the bank assist in rehabilitating existing staff houses and build new ones to motivate the teaching staff.	This request will be relayed to the bank.
The pupils can at times abscond from school for over a month. The committee requests the bank to assist in building a new dormitory. This will help in confining the pupils in the school.	Request is noted and will be relayed to the bank.

Conclusion

The stakeholder consultation ended at 1:00pm. The participants gave support to the proposed programme and reiterated that it would not negatively impact on their culture and social norms. They felt that it would instill in the community a new positive and beneficial culture and assist in eradicating old archaic ones; these being Female Genital Mutilation, early marriages and the like. The deputy head teacher closed with a vote of thanks and a prayer.