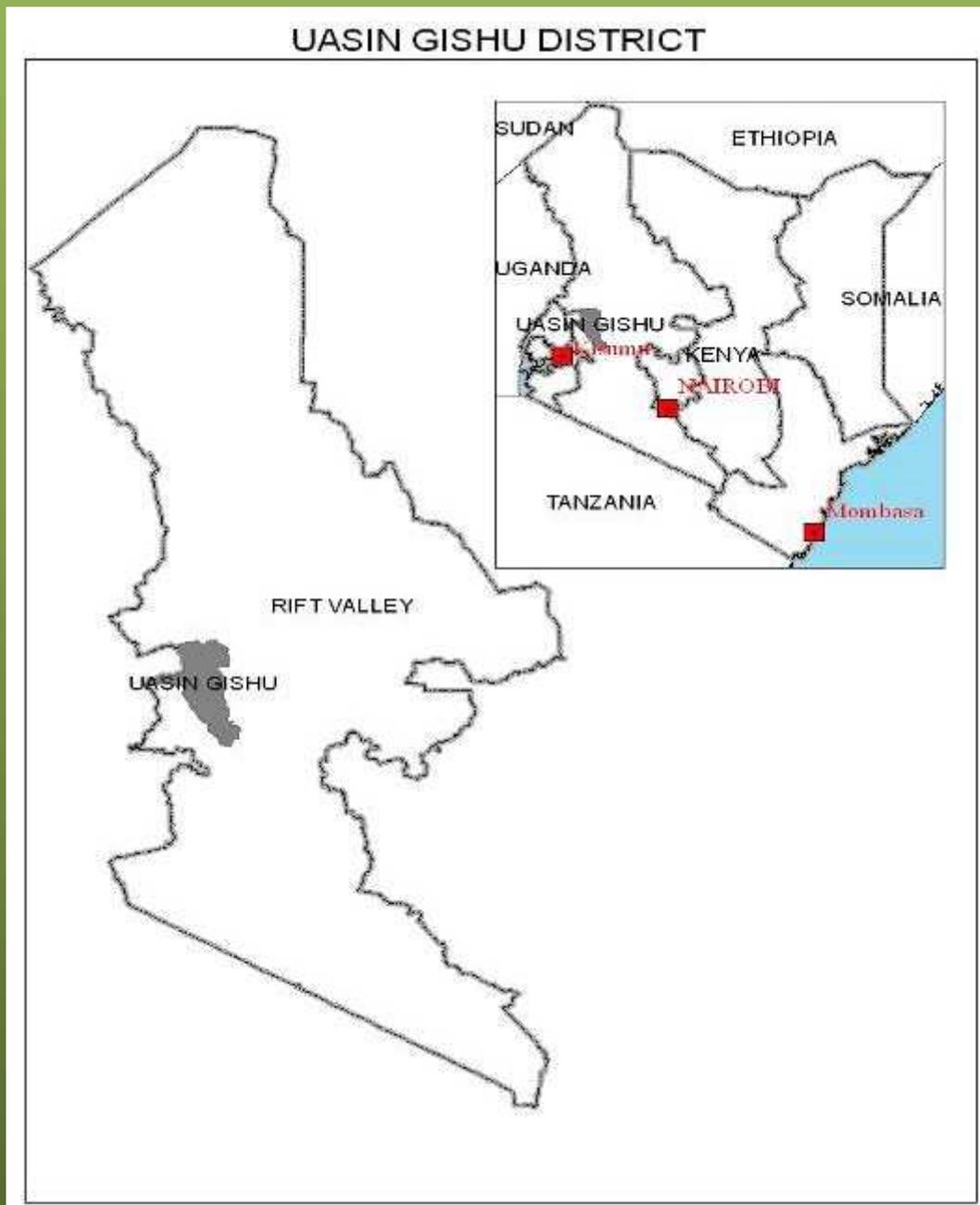




REPUBLIC OF KENYA
MINISTRY OF ENVIRONMENT AND MINERAL RESOURCES
NATIONAL ENVIRONMENT MANAGEMENT

AUTHORITY



UASIN GISHU DISTRICT
ENVIRONMENT ACTION PLAN
2009-2013

EXECUTIVE SUMMARY

Economic growth and environment are closely intertwined in Kenya's development. Environmental Action Planning is a tool that aims at enhancing the integration of environment into development planning. UasinGishu District faces many environmental challenges with some being unique to the District.

Poverty has led to the over-use and destruction of environment. Continued reliance on trees for fuel and wetlands for farming and its resources has led to deforestation and wetland encroachment. Annual flooding continues to destroy property and frustrate farming.

The DEAP highlights priority themes and activities for the District towards achieving sustainable development. The report is divided into eight chapters. Chapter one gives the challenges of sustainable development and also describes the rationale for and preparatory process of the DEAP. The chapter introduces the district's main profile covering the physical features, demographic, agro-ecological zones, and main environmental issues.

Chapter two describes the District's Environment and Natural resources of Land, Water, Biodiversity (forest, wildlife, and Dry lands biodiversity), wetlands and agriculture, livestock and fisheries. For each resource, major environmental issues, challenges and proposed interventions are identified.

Chapter three discusses the Human settlements and infrastructure in UasinGishu District covering situation analysis, challenges and proposed interventions. Environmental challenges addressed include; waste management, sanitation, pollution, diseases, land use, demand for water, energy, materials for construction, land and wetlands degradation, policy and legislation, biodiversity loss and land tenure.

Chapter four addresses environmental aspects in tourism, trade, industry and services sectors. The key issues under this chapter are high pollution levels from industrial activities and weak enforcement of relevant legislations.

Chapter five discusses environmental hazards and disasters. The major hazards covered include; drought and floods.

Environmental information, networking and technology are discussed in chapter six. It emerges that environmental information and networking technology have continued to receive scanty attention.

Governance, Policy and Legal Framework as well as Institutional arrangements are set in chapter Seven. The key issues addressed include; harmonization of environmental legislations and institutional mandates, incorporation of indigenous knowledge in environmental management. Chapter eight is the implementation Matrix.

FOREWORD

The 1992 Earth Summit held in Rio de Janeiro came up with various recommendations, among them Agenda 21, a Global Environmental Action Plan. The theme of the Summit focused on how nations could attain sustainable development. The Government of Kenya embraced this idea by developing the first National Environment Action Plan (NEAP) in 1994.

Since independence, Kenya has continued to demonstrate her commitment to environmental management through various initiatives, among them the National Development Plans of 1974 and the National Environment Action Plan of 1994. Further, there have been a number of sectoral policies on environment in fields such as Agriculture, Livestock, Water, Energy, Food, Land, Wildlife, Forest, Industry, Trade, Arid Lands, Disaster Management and the Draft Sessional Paper No. 6 of 1999 on Environment and Development.

The Environmental Management and Coordination Act (EMCA, 1999) provides for the integration of environmental concerns in national policies, plans, programmes and projects. In this regard, EMCA 1999 provides for the formulation of National, Provincial and District Environment Action Plans every five years.

Environmental Action Planning is a tool that aims at integrating environmental concerns into development planning. The process followed in preparing this DEAP was participatory, involving various stakeholders from institutions and sectors, including the public, private, NGOs and local communities at District and Divisional levels. These consultative meetings provided the basis also for formulation of the PEAP and finally the National Environment Action Plan.

The DEAP addresses environmental issues from various sectors in an integrated manner and discusses their significance in development planning. It proposes a strategy for achieving sustainable development in line with Kenya's quest to meet the Millennium Development Goals (MDGs) Vision 2030 and Medium Term Plan (MTP2008-2012). The Plan has brought out a number of proposed interventions, legal and institutional framework to be incorporated into sectoral development plans and programmes. Its implementation will be monitored by the DEC and will be reflected in the State of the Environment Reports.

The preparation of the DEAPs for UasinGishu owes much to the technical and financial assistance provided by the NEMA This support, which included innovative community and civil society consultations, facilitation of DEC meetings, as well as final publication costs, is gratefully acknowledged

I wish to underscore that the 2009-2013 DEAP report is a broad-based strategy that will enable the District attain sustainable development as envisaged in Vision 2030

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ACKNOWLEDGEMENT

Environment Action Planning is a multi disciplinary, multi stakeholder and multi-sectoral participatory process. In this connection, many institutions and individuals have contributed immensely to the preparation of this District Environment Action Plan. I take this opportunity therefore, to acknowledge all those who contributed to its preparation.

I particularly acknowledge with appreciation the participation of the District technical Committee charged with the responsibility formulating this action plan for their valuable input, participation and tireless effort to accomplish this task. I further thank the different departments NGOs, CBOs, Research institutions and individual who provided information and data that was the building blocks for this plan.

I also acknowledge the support of NEMA headquarters and the board for facilitating the entire process through provision of appropriate guidance and finances respectively to complete the exercise. Together I am grateful to the Provincial Director of Environment - Eastern Province and the District Environment Officer UasinGishu for the inputs and commitment to the entire process of preparation of this document.

It is my belief that this plan will be implemented for the betterment of our environment in UasinGishu District, the province and the country at large.

Dr. Kennedy I. Ondimu

DIRECTOR, ENVIRONMENTAL PLANNING

& RESEARCH CO-ORDINATION

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LIST OF ACRONYMS

ASALs	Arid and Semi Arid Lands
CBOs	Community Based Organizations
CDM	Clean Development Mechanism
DDOs	District Development Officers
DDPs	District Development Plans
DEAPs	District Environment Action Plans
DDC	District Environment Committee
DEOs	District Environment Officers
EMCA	Environment Management Coordination Act
EMS	Environmental Management System
ERSW&EC	Economic Recovery Strategy for Wealth and Employment Creation
GDP	Gross Domestic Product
GIS	Geographical Information System
IK	Indigenous knowledge
MDGs	Millennium Development Goals
MEAS	Multilateral Environmental Agreements
MENR	Ministry of Environment and Natural Resources
MOH	Ministry of Health
NDPs	National Development Plans
NEAP	National Environment Action Plan
NEAPC	National Environmental Action Plan Committee
NEMA	National Environmental Management Authority
NEPAD	New partnership for Africa Development
NGOs	Non-Governmental Organizations
PDEs	Provincial Directors of Environment
PEAP	Provincial Environment Action Plans
PEC	Provincial Environment Committee
PPO	Provincial Planning Officer
PRSP	Poverty Reduction Strategy Paper
SEAs	Strategic Environment Assessments
TAC	Technical Advisory Committee

UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Development Programme
WC	Water Closet
WHO	World Health Organization
WSSD	World Summit on Sustainable Development

CHAPTER ONE

1.0 INTRODUCTION

1.1 Preamble

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992 had a double mandate of finding ways to protect the global environment while ensuring that economic and social concerns are integrated into development planning. The Conference underscored the need to developing modalities for integrating environmental concerns into development policies, plans, programmes and 'projects. It agreed on the guiding principles and a global plan of action for sustainable development commonly called Agenda 21

The World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, reaffirmed the commitments of the international community to the principles of sustainable development contained in Agenda 21 and the Millennium Development Goals (MDGs) of 2000.

Sustainable development is commonly defined as *"development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs"*. Development is also sustainable if it meets ecological, economic and social needs. This calls for the integration of environmental considerations at all levels of decision making in development planning and implementation of programmes and projects.

The Government of Kenya is committed to the achievement of sustainable development stated in Agenda 21, the Millennium Development Goals, Vision 2030 and the Johannesburg Plan of Implementation. This commitment to environmental protection and sustainable use of natural resources is well articulated in various Government policy documents including the Sessional Paper No.6 of 1999 on Environment and Development, the Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) and the National Development Plan (2002-2008). These policies and plans recognize integration of environmental concerns into national planning and management processes and provide guidelines for achieving sustainable national development.

The 9th National Development Plan (2002-2008) states that *"The full integration of environmental concerns in development planning process at all levels of decision making remains a challenge to the country, the need to integrate environmental concerns in development activities should be given high priority"*. The Environmental Management and Coordination Act (EMCA) of

1999 provides for the integration of environmental concerns into the national development process. The National Environment Management Authority (NEMA) is mandated to implement the Act and in particular coordinate the preparation of Environmental Action Plans (EAPs) at the District, Provincial and National level.

Poverty is a major challenge to the Goals of the sustainable development. Sound environmental and natural resources management should contribute to poverty reduction, food security and sustainable livelihoods, enhanced environmental quality and health, promotion of sustainable energy production, minimization of pollution and waste, improvement of shelter and habitats, promotion of eco-tourism and improved standards of living.

1.2 Challenges of Environmental Management

Kenya's economy primarily depends on natural resources where over 68% of the population live in rural areas and derive their livelihoods mainly from these resources. Economic activities derived from, the natural resources include agriculture, industry, tourism, energy, water, trade, and mining. The environment and natural resources have in the recent years been under, threat due to increased dependence on natural resources to meet basic needs. The situation is aggravated by the rising poverty levels from 42% in 1994 to 56% in 2002 and is currently estimated to be over 62%. The situation is even worse within the rural population. The population growth rate has over time become higher than the economic growth rate hence the pressure on these resources. This has also led to increased in-migration and over-utilization of fragile ecosystems. The immigration into marginal areas from high potential areas has contributed to unsustainable land use practices often resulting in resource use conflicts especially water and pasture.

Poverty often leads to over-use and destruction of the environment where short-term development goals and practices are pursued at the expense of long-term environmental sustainability. Once the resource base is degraded, poverty is aggravated because the capacity of the resource base to support the same population even with unchanged demand will have diminished. Therefore, there exist a close link between poverty and environment.

Rapid urbanization coupled with increased slum settlements due to rural-urban

migration have resulted in urban decay, loss of environmental quality and health deterioration, water pollution, loss of biodiversity and encroachment of fragile ecosystems. In both rural and urban areas, access to safe drinking water and basic sanitation is a critical environmental and health concern. The widespread accumulation of solid wastes and poor disposal of effluents in urban areas is also an environmental hazard culminating in air and water pollution and increased incidences of respiratory and water borne diseases.

About 88% of Kenya's land areas are classified as arid and semi arid lands (ASALs) which supports over 50% of livestock, about 30% of the population and most wildlife. Climatic variability has reduced the capacity of ASALs to support existing and emerging livelihoods thus further aggravating environmental degradation. This is evidenced by increased soil erosion, reduction in pasture and vegetation cover, food insecurity, increased conflicts and insecurity - all contributing to increased poverty

Prior to the enactment of EMCA 1999, environment management in Kenya mainly focused on administrative boundaries with little regard to trans-boundary and shared resource issues. Consequently, management of these resources has not been adequately addressed, including watersheds, wildlife and mountain ecosystems among others. The challenge is to develop integrated management plans for inter- and intra-districts, provinces, regional, national and international boundaries.

Indigenous management systems that are sustainable have largely been disregarded in the recent past leading to environmental deterioration. Sectoral regulatory instruments, which have been used to manage the environment before enactment of EMCA 1999, did not achieve the desired outcomes. This is largely attributed to lack of linkages, sectoral conflicts/overlaps, resource limitations, inadequate stakeholder involvement hence weak compliance and enforcement.

The challenge of managing environmental resources sustainably calls for the development of integrated management plans and, their implementation. Integrated planning enables harmonization of sectoral priorities, stakeholder involvement and participation, proper programming and budgeting system.

Section 38 of EMCA provides for the preparation of District, Provincial and National Environment Action plans every five years.

1.3 Provisions of EMCA on Environmental Planning

Part IV of the Environmental Management and Coordination Act (EMCA), 1999 deals with environmental planning at the national, Provincial and district level. Section 40 specifically deals with environmental planning at the district level and states in part:

Every District Environmental committee, shall every five, years prepare a district environment action plan in respect of the district for which it is appointed and shall submit such plan to the chairman of the provincial environment action plan committee for incorporation into the provincial environment action plan proposed under section 39.

1.4 Objectives of District Environment Action Plan

- To determine the major environmental issues and challenges facing the country;
- To identify environmental management opportunities;
- To create synergy and harmony in environmental planning;
- To integrate environmental concerns into social, economic planning and development; and
- To formulate appropriate environmental management strategies.

1.5 The environmental action planning process

DEAP METHODOLOGY

The process started by holding regional workshops, which the DEAP Secretariat was appointed by the Director General in 2004. That comprised of a District Water Officer, District Development Officer (DDO) and District Environment Officer (DEO) to attend an induction course on the DEAP methodology. The District Environment Committee (DEC) members gazetted in 2003 were further requested to form a District Environment Action Planning Committee (Technical Committee comprising lead agencies and representatives from other stakeholders), chaired by the DDO and the DEO is the secretary. Once the draft DEAP is prepared, the DEC approves and submits to the Provincial Environment Committee for inclusion in the Provincial Environment Action Plan.

The District Environment Action Planning Committee spearheaded the preparation of the UasinGishu DEAP. The committee requested for sectoral environment reports from the lead agencies and compiled the DEAP. The UasinGishu District Environment Action Plan was further enriched through participatory planning

approach in which consultation workshops at the district

The preparation of the UasinGishu DEAP has been realigned with Vision 2030, Mid-Term Plan 2008-2012 as directed by the government. The current DEAP covers the period of 2009-2013 and as per EMCA shall be revised after every five years. The DEAP will be monitored by the annual preparation of the State of Environment Reports. The environmental indicators that have been developed in the implementation matrix will be monitored by the respective lead agencies on an annual basis and incorporated in the annual State of Environment Report. The National Steering Committee and the National Environment Action Planning Committee have approved the indicators.

1.6 District profile

1.6.1 Geographical Location, Size and Administrative Units

Uasin Gishu is one of the districts in the Rift Valley province of Kenya. It lies between longitudes 34° 50' and 35° 37' E' and latitudes 0.03° and 0.55°. It has, as its neighbours, Trans Nzoia to the North, Marakwet and Keiyo to the East, Uasingishuto to the South East, Kericho to the South, North and South Nandi to the west and Kakamega and Lugari to the North West.

The district covers a total area of 3327.8 km²

Administrative Units

Uasin Gishu is made up of 6 (six) divisions as shown in the table below.

Table 1 : Administrative Units by area and number

Division	Area (km ²)	No. of Locations	No. of sublocations
Soy	766.8	10	19
Moiben	778.2	10	23
Ainabkoi	472.5	10	22
Kesses	692.1	10	17
Kapsaret	297	4	6
Turbo	321.2	7	10
Total	3218	51	96

Source: DDP; 2002 - 2005

The district has three constituencies namely Eldoret East, Eldoret North and Eldoret South. There are three local Authorities namely Wareng County Council, covering the widest area with 21 wards, Eldoret Municipal council with 15 wards and Burnt Forest Town Council with 6 wards.

1.7 Climate and physical features

The district is a highland plateau ranging from 2700m above sea level at Timboroa and 1500m above sea level at Kipkaren. Eldoret lies at an altitude of 2085m above sea level.

The rivers in the district drain into Lake Victoria. These rivers are dotted with many dams and wetlands which help regulate river flows. The higher forested areas in the south act as part of the catchment for the rivers. The forests are Timboroa, Cengalo, Nabkoi, Lorenge, Kipkurere and Kapsaret.

1.7.1 Geology and Soils

The Geology is mainly composed of basalt rock outcrops of Pre-Cambrian formations. The top layer of soil is mainly red loam soils and underlying is a layer of murrum. The rocks are hard and their extraction requires blasting and heavy machinery. The main soil types are red loam, red clay brown clay and brown loam soils.

1.7.2 Agro ecological zones

LH₃ – Low highland which occupies the largest part of the district and covers Moiben, Kesses, Soy and Kapsaret. Maize and wheat are the major crops.

UH₄ – Upper midland covering Turbo (Tapsangoi and Sugoi areas) and is a maize zone.

UH₂ – Upper midland covering Timboroa. Wheat and pyrethrum are the main crops. Much forest is found here.

LH₄ – Lower highland covering Moiben, Soy, Kesses, and Kapsaret. Cattle, sheep are reared, and crops grown include wheat and barely.

1.7.3 Vegetation

Uasin Gishu is mainly agricultural. The common vegetation is grassland with scattered bushes and trees. Forests cover an area of about 29801.92ha with 56% being indigenous and the rest being exotic plantations.

1.7.4 Drainage

Uasin Gishu is well drained with many perennial rivers, streams and springs and numerous wetlands. The permanent rivers include Moiben, Little Nzoia, Sergoit, Ellengerine, Endorota, Sosiani and Kipkaren rivers. The district drains its waters into Lake Victoria.

1.7.4 Climate

Uasin Gishu has high, reliable rainfall averaging between 900mm and 1200 mm. The rainfall is experienced in March to September, with two peaks in May and August. The wettest areas are Ainabkoi, Kesses and Kapsaret divisions. Turbo receives average rainfall while Moiben and Soy relatively low rainfall. November to March is dry months.

The mean temperature is 18⁰C, with an average maximum of 23.4⁰C and a minimum of 9.8⁰C. and 26.1 degrees centigrade.

1.8 Population size and distribution

Uasin Gishu District has a population size of 622,705 people. Of these, 315,932 are males while 306,773 are females (1999 census). The growth rate is 3.35% per annum. The urban population is estimated at 32% of the total district population. The high population growth rate can be attributed to natural factors (birth and death). Industrial growth of Eldoret town and other urban centres and land for settlement since the district has been seen as a settlement area.

Population distribution is as shown in the tables below:

Table 2: Population Distribution in terms of male, Female and Density per Division

Division	AreaKm ²	Male(No)	Female(No)	Total(No)	Density(Persons/km ²)
Moiben	778.2	47084	45630	92717	119
Soy	766.8	83068	82059	165127	215
Kesses	692.1	42693	42201	84894	123
Ainabkoi	472.1	38590	38707	77297	164
Turbo	321.2	55778	53730	109508	341
Kapsaret	297	46716	44446	93162	314
Total	3327.8	315932	306733	622705	-

Table 3: Urban Population of major towns/centres in Uasin Gishu

Town/centre	Population(No)
Eldoret	197449
Burnt Forest	30166
Moi's Bridge	21844
Matunda	11214
Kipkaren	145
Turbo	2701
Timboroa	3038

Table 4: Population distribution by Gender for Uasin Gishu District

Year/Gender	1962	1969	1979	1989	1999	2005(est.)
Male (Adult)	26, 377	50, 819	65, 189	95, 412	139, 917	162, 277
Female (Adult)	23, 455	43, 855	57, 829	91, 163	132,416	166,530
Total	49, 328	94, 704	123, 017	186, 575	272, 333	328, 907
Children (Male)	25, 835	49, 015	89, 434	131, 678	172, 111	209, 934
Children (Female)	24, 966	47, 317	89, 941	131, 836	172, 091	205, 335
Total	50,831	96, 332	179, 375	263, 514	344, 202	415, 269
Grand Total	100,663	191, 036	302, 392	450, 089	616, 535	744, 176

Table 5: No. of Urban Centres by actual Population – 1999 Census

Name of Centre	Status	Male	Female	Total	Sex Ratio
>100, 000 Eldoret	Municipality	103, 402	94, 047	197, 449	110
20,000 – 99,999 Burnt Forest	Town Council	14, 831	15, 335	30, 166	97
*Moi's Bridge	Other towns	10, 677	11, 167	21, 844	96
10,000-19,999 *Matunda	Other towns	5, 411	5, 803	12, 214	93
1,000-9,999 Turbo	Other towns	1, 326	1, 375	2, 701	90
100 – 999 **Kipkaren	Other towns	78	67	145	116

* Shared between Uasin Gishu and Lugari

** Shared among Uasin Gishu, Lugari and Nandi North

Population of municipalities, Town Councils and other urban centres (1999)

Source: Statistical abstract 2002 (CBS)

Uasin Gishu has not experienced the impact of refugees. Would be refugees from neighboring Marakwet District have settled on land that they purchased. Immigrants come to the district either for business or settlement on plots or agricultural land.

Rural urban migration has been noted among the youth who tend to seek employment or business opportunities in urban areas, especially Eldoret town. There is also temporary migration from rural to urban centers during and immediately after harvesting maize and wheat in October and November. This affects the older but still active age bracket. Emigration is not common. A good number of people moved out of their farms during the 1992 – 1994, and 1997 ethnic clashes to towns and even out of the district. However, most of these people have since come back. There is no tangible data on migration.

1.9 Social, cultural and economic characteristics

A good number of people in the district can be termed as poor. The poor are defined as those members of society that are unable to afford minimum basic needs – food, shelter and clothing. Poverty can be classified as:

- i. Material poverty
- ii. Relative poverty

It can also be classified as:

- i. Food poverty
- ii. Overall poverty

Classification of the poor includes lack of land and education. Categories of the poor include small-scale farmers, agricultural laborers, unskilled and semi skilled workers, female-headed households, physically handicapped, HIV/AIDs orphans and street children.

The overall poverty in Uasin Gishu is estimated at 42.22%, poverty gap (depth of poverty) at 12.4% and severity of poverty at 5.04 % (1994 welfare Monitoring Survey, WMS). Food poverty was estimated at 46.62%.

Levels of Income are dependent upon economic activities undertaken, and this in turn determines the poverty levels. As income levels decline, people tend to undertake any form of economic activities regardless of their impact on the environment. In Uasin Gishu, high levels of unemployment, high living costs and low incomes have resulted to such activities as deforestation, cultivation along river banks, encroachment into wetlands and cultivation of steep slopes, of which are land degrading activities. Low incomes are also resulting to more slum dwellers in Eldoret town. These are areas with low cost housing facilities like Langas, Kamukunji and some parts of Huruma estates. These estates are poorly served with infrastructure due to poor planning and inaccessibility. The areas experience poor waste disposal, use poor quality construction materials like polythene, mud, wood and wetland products. These areas experience high insecurity. Generally, poor people use cheap sources of energy like fuel wood, and in turn they deplete forest resources.

On the other hand, the large-scale farms offer high income, either from direct sale of farm produce or from employment, both direct and indirect. Good income has a positive impact on the environment, enabling people live in well planned housing estates with

good infrastructure including proper sewage disposal. High-income people also tend to use energy sources that are less harmful to the environment, like electricity and gas.

High income classes also have their negative impacts. Refrigerators may use Ozone depleting methyl bromide, while motor vehicles contribute to air pollution, especially the poorly maintained. High vehicle population demands more fuel, hence more petrol stations with their potential negative impacts if not well maintained. Car wash cause a lot of water pollution. Eldoret town is a victim of this negative impact by high income earners. River Sosiani receives much of the car wash effluent. Most petrol stations do not have proper waste disposal systems, especially for used oil and car wash. These pollutants end up in the river.

CHAPTER TWO

2.0 ENVIRONMENT AND NATURAL RESOURCES

2.1 Land use and soils

This chapter gives a description of the soils and land use patterns in Uasin Gishu District. It focuses on the types, extent, status and trends of soils and land use. The district is well endowed with a fairly flat land and fertile soils, which support agriculture, livestock and forestry. An accurate understanding of the soil types and land use situations calls for the need to examine the geology of the area because the soils are formed from the parent rocks.

Geology

The geology of Uasin Gishu district is dominated by Tertiary volcanic's consisting mainly of alkalines, basalts, and phonolites among others. The district has no commercially exploitable minerals.

Soils

There are four main soil types in the district.

1. **Red loam soils** – Occur mainly in the northern part of the district in Turbo, Moi's Bridge and Lower Moiben areas. The soils are derived from the basement complex rocks e.g. granites and laterites, and mainly support maize sunflower and cattle. Vegetation comprises of scattered tree grassland (low tree – high grass).
2. **Red clay soils** occur around Soy Upper Moiben and Nandi border areas. These are derived from phonolites. In some cases murrum is of good depth. They support wheat and maize growing. Vegetation is similar to (1) above.
3. **Brown clay soils** – These are centered mainly around Plateau station and cover most of the Upper Lessos/plateau Location. These are mainly shallow with murrum close to the surface and poorly drained. The soils are good for rearing beef livestock.
4. **Brown Loam Soils** – Occur in high altitude areas of the district, mainly in Ainabkoi and Kaptagat locations. They are derived from both volcanic and basement complex rocks. They are deep soils. Vegetation is natural highland forest and derived grassland (mainly kikuyu grass) and bush land. The soils are good for forestry, dairying and wheat, pyrethrum, potatoes, oats and barley farming.

Regulatory and institutional arrangements Governing soil Administration

Under Chapter 318 of the Laws of Kenya, The Ministry of Agriculture is mandated to provide technical advice on the use of soils as a resource. The extension officers at the divisional level sensitize farmers on the best practices for soil conservation.

Key environmental issues

The key environmental concerns in the soils sector in Uasin Gishu District include;

- Poor soils/low fertility
- Soil erosion
- Water logging
- Soil excavations for brick making and sand harvesting
- Pollution of soils arising from dumping of wastes and agro-chemicals

Proposed Interventions

It is suggested that the soil-based environmental issues be isolated and addressed as follows;-

1. Poor soils/low fertility of soils can be improved by use of the environmentally friendly fertilizers such as compost manure. Crop rotation will be encouraged as a strategy for improving the fertility of soils.
2. Soils erosion can be curbed through enforcement of the existing agricultural regulations requiring that terraces be created and contour farming be adhered to in areas with hilly topography.
3. Water-logging is a common problem in areas covered by clay soils. This situation can be improved by provision of open drains to re-direct the water to the primary drainage systems.
4. The problem of excavation of soils for brick making and sand harvesting is rapidly expanding in Uasin Gishu District. This leaves the land surface bare and disfigured. The excavation of soils activities should be regulated and the derelict land be rehabilitated and be planted with trees to enhance the aesthetic qualities of the affected areas.
5. On soil pollution occasioned by dumping of wastes in the urban areas and use of agro-chemicals in the farms, proper methods of waste disposal should be encouraged whereas the use of environmentally friendly agro-chemicals should be used in the farming sector.

2.2 Land and land use changes

The entire 3,784 sq. Km. of Uasin Gishu is arable land. It is estimated that about 2,354 Km² of the land area is considered to be high potential whereas about 1430 Km² is medium potential. There is neither marginal nor irrigated land in the district.

In terms of the Land Area and category of land use, it is estimated that out of the 235,400 hectares of high potential land in Uasin Gishu nearly three fourths of it is in Timboroa, Kaptagat and Turbo locations. Most of the medium – potential land is to be found in Moiben and Lessos/Plateau locations.

Forest reserves occupy around 6100 hectares. Some 37,260 hectares had been parceled into conventional settlement schemes by 1983. The existing forests in the district are mainly the Kapsaret and Timboroa forests.

The main farming characteristic in Uasin Gishu is mixed type; maize, dairying, wheat and beef cattle rearing form the dominant enterprises. The production combinations are generally cattle/maize/wheat in any sequence. In the warmer parts of the district in areas around Turbo Division, sunflower and beans feature prominently in the basic pattern, while in the southern parts of the district bordering the forest zone, pyrethrum and potatoes are grown.

2.2.1 Impacts of land use changes

The impacts of land use changes include: -

- Over utilization of land
- Intense subdivision of land
- Encroachment of fragile environments e.g. rivers, wetlands and forest
- Competing land uses e.g. wheat verses maize farming
- Encroachment of fertile agricultural land by expansion of towns
- Environmental degradation

2.2.2 Regulatory and institutional arrangements governing land administration

There are many land laws and institutions governing land use, ownership and land transactions in Kenya. Land in Uasin Gishu District is held under freehold, trust and the leasehold. The local authorities are agents of the Commissioner of Lands and are responsible for all land transactions relating to leasehold land. Some leases in the district were granted for a term of 999 years and the same are being converted through purchase

of freehold instruments from the Commissioner of Lands. The Departments of Survey, Physical Planning, Lands and Settlement are responsible for implementation of land use policies and transactions on the ground in consultation with other Government Departments and stakeholders.

Other collaborative institutions that play some roles in processing and approving land transactions include land disputes tribunal, land control Boards, Physical Planning Liaison Committees and land Adjudication and Settlement Committees. They are responsible for ensuring that land is managed in the accustomed ways and means.

2.2.3 Prioritization of key Environmental issues;

The environmental issues can be ranked as follows;

- Over utilization/infertility of soils
- Intensive land subdivision
- Encroachment of wetlands, river riparian
- Excavation of soils for brick making and sand harvesting
- Pollution, dumping of wastes on soils
- Soil erosion.

2.3 Agriculture

Agriculture still remains one of the most important sectors in the Kenyan economy. It directly contributes 26% of the Gross Domestic Product (GDP) and a further 27% indirectly through linkages with manufacturing, distribution, and the service related sector. In addition, about 80% of the population lives in the rural areas and depend mainly on agriculture for livelihood. 87% of all poor households live in rural areas where their main economic activity is agriculture.

In Uasin Gishu, the main agricultural production system is small-scale mixed farming where farmers grow various crops and keep livestock, mainly cattle on the same land parcel. However, there are a few large scale farmers. Over the years, most farmers have been involved mainly in three commercial enterprises i.e. wheat and maize production, and dairy farming, with the other crops being grown only for domestic use. However, in the last few years, farmers have been involved in diversification of their commercial agricultural enterprises, mainly in the area of horticulture. Many farmers continue to take

up production of various vegetables and fruits for both local and export market. A few farmers in the district have also taken up sun flower production.

Maize production is the main crop enterprise in the district. The area under this crop has increased in the recent years, reaching 65,758ha in the year 2005. Total production has equally increased over the same period and reached about 2.8million bags in 2005, valued at slightly over 3.4 billion. It is important to mention here that this crop is not only a food crop but an important cash crop in the district.

The increase in production can be attributed to improving producer prices, which reached Kshs. 1300.00 per 90 kg bag in 2005, good weather conditions, timely field operations and adoption of new high yielding varieties such as H6210, H6213, H628, H629, and Pan 699. There was also opening up of new land from former EATEC owned land.

2.3.1 Regulatory and Management Arrangements

The Ministry of Agriculture is charged with the responsibility of regulating and managing agricultural production in this country and its current vision is ‘To be the leading agent of agricultural transformation in Kenya.’

To enable the ministry achieve its objectives, the sector is governed by about 130 pieces of legislation. There are various statutory boards, institutions and farmer organizations all charged with the responsibility of regulating this sector. However, according to the Strategy for Revitalizing Agriculture (SRA), currently in the implementation phase, many of the pieces of legislation have been found to be obsolete, unenforceable, or inconsistent with the changes taking place in the sector. The Laws will be reviewed with the objective of:

- i. Amalgamation of existing legislation to have fewer and broad based acts to suit prevailing circumstances.
- ii. Encourage self-regulation by facilitating capacity building for stakeholder organizations.
- iii. Encourage collaboration and private sector participation.

Institutions such as research organizations, extension services, supply of inputs and animal health and plant protection services are also in the process of being reformed.

Table 6: Crop Production Statistics

Crop	Extent (Ha)	Current Production Level kg/ha	Potential Production Level kg/ha
Maize	65758	43	60
Wheat	37500	33	40
Millet	1080	9	15
Sorghum	183	9	15
Beans	27842	5	15
I/potatoes	2960	90	120
Kales	460	70000	100000
Cabbages	450	40000	80000
Tomatoes	355	50000	100000
Passion fruits	295	15000	20000
Carrots	400	20000	30000
Bananas	4400	20000	30000
Avocados	1050		
Onions	170	17000	20000

2.3.2 Key Environmental Issues

- i. Encroachment into water resources and forests
- ii. Soil degradation and loss of fertility
- iii. Pollution through fertilizers, chemicals, agricultural wastes
- iv. Destruction of natural habitats
- v. Pesticide residues in agricultural products
- vi. Food safety
- vii. Workers safety

The farmer/organization should identify environmental aspects that emanate from the activities at every stage of agricultural production. The following are types of pollutants and wastes that emanate from agricultural production activities.

Table 7: Types of pollutants emanating from agricultural activities

Process/Activity	Environmental Aspects
Transport	Old machines, oil, tubes, old tyres
Personnel	Human wastes, clothes, effluent water, food remnants,
Seed	Seed packaging
Land preparation	Smoke from tractor, dust, soil erosion, soil compaction, plant materials
Spraying	Expired chemicals, chemical containers, chemical spillage, chemical left over, excess spray mixtures
Weeding	Weeds
Irrigation	Excess irrigation, use of salty water
Fertilizer use	Excess fertilizer, plastic containers, inappropriate application/use
Harvesting	Harvesting containers, harvesting wastes
Park house	Rejected wastes, washing effluents, used preservatives, package rejects
Cooling	Compressor gas
Storage wastes	Fertilizer spillage, chemical spillage, contaminated water
Testing laboratory	Contaminated water

2.3.3 Proposed Interventions

- i. Training of farmers and other stake holders on all environmental aspects of their activities
- ii. Carry out environmental impact assessment s
- iii. Set rules and regulations for the organizations/farmers to comply with, to ensure environmentally safe agricultural activities e.g. EUREPGAP, K-GAP, e.t.c.
- iv. Auditing farmers activities against set standards
- v. Training farmers/organizations on sustainable agriculture which minimizes environmental pollution
- vi. Train farmers on good agricultural practices and use of appropriate technology; e.g. soil and water conservation, soil fertility management, use of organic matter, integrated pest/disease managements as opposed to indiscriminate use of chemical pesticides
- vii. Partnership, collaboration, and participation of all the stakeholders to ensure safe environment

viii. Awareness creation to the farming community.

2.4 Livestock production

2.4.1 Types of Production Systems

Most farmers in the District practice free range grazing whereby livestock is subjected to mixing up. Some farmers have their own bulls reserved for breeding purposes and mating may occur indiscriminately. AI services are offered but farmers in remote areas may not have adequate access to the service. Indigenous herds of cattle are almost phased out.

Zero grazing is rare and where found, it is for dairy cows. Sheep and goats are herded together with cattle. Livestock feed is used to supplement the diet. Fodder crops are grown on limited farms. Bee keeping is coming up and the use of modern hives like langstroth and Kenya Top Bar Hives is on the rise.

Poultry in the real sense is not practiced by many farmers. Pig rearing is practiced in urban areas where they are left to wander. Farmers Choice has one breeding and rearing farm in the former EATEC farm along Nairobi road.

2.4.2 Area Coverage (Ha)

Livestock keeping is done throughout the district with a higher concentration in the drier areas of Moiben Division and cooler areas of Ainabkoi Division. It is normally integrated with crop production. Trends in fodder and pasture development are as follows:

Table 8: Fodder and Pasture development

Type (ha)	2003	2004	2005	Remarks
Fodders	8189	8859	9350	All fodder types included
Legumes	87.5	89.5	113	Seeds readily available at Kenya Seed and KARI
Fodder Trees	41155	40938	42435	
Improved Pasture	41026	43665	46832	
Natural Pastures	47852	47069	49793	Most common forage

2.4.3 Production Patterns, Status and Trends

a) Dairy cattle

Table 9: Dairy cattle production trends

Year	2003	2004	2005
Population	345219	325200	345672

Dairy cattle population trends

Table2-5: Table 10: Breeding: Artificial Insemination Trends

Year	1 st Insemination	Repeat	Total
2003	148	51	199
2004	99	32	131
2005	117	58	175

Breeding is constrained by poor timing of heat detection which causes repeat, breeding diseases, poor road network, lack of roadside AI crushes, nutritional disorders and poor feeding which causes poor conception rates.

b) Bees

Table 11: Hive population and production trends

Year	KTBH	Log Hive	Langstroth	Honey (kg)	Wax (kg)
2001	8347	11392	107	238068	23806
2002	8380	11315	345	172292	14070
2003	8401	11452	448	219806	20810
2004	8330	11312	654	232900	21742
2005	8580	12820	1238	218599	23753

Bee keeping is coming up. It is constrained by the following:

- i. Inadequate staff trained on bee keeping
- ii. Inadequate funding to carry out bee keeping
- iii. Expensive bee keeping equipment
- iv. Lack of organized market for honey and wax.

Bee keeping is normally done by groups of farmers.

c) Sheep

Sheep production is second to dairy production. There is high potential for hair and wool production. Hair sheep are widespread and supply red meat. Wool sheep are confined to Kesses and Ainabkoi Divisions. The sheep population trends are shown below.

Table 12: sheep population trends

Type of sheep	2003	2004	2005
Wool sheep	17821	22391	22492
Hair sheep	23179	23228	27843
Crosses	76250	84796	91205
Total	118248	130415	141540

Wool sheep are likely to increase due to current ready market at RUPA mills.

Constraints in sheep production include:

- i. Inferior breeds with light body weights and slow growth rates
- ii. Poor breeding programs that encourage inbreeding
- iii. Poor husbandry practices of lack of worm control hoof trimming, and proper feeding.
- iv. Poor housing resulting to diseases e.g. foot rot and pneumonia.
- v. Expensive and scarce superior breeding stock.

Possible Solutions

- i. Encourage farmers to upgrade their local stock using superior breeds e.g. Dorper
- ii. Train farmers on good husbandry practices
- iii. Educate farmers to develop good breeding programs, procure superior rams and exchange amongst themselves.
- iv. Train farmers on the importance of good housing for sheep. Construct improved houses as demonstration models using standard plans.
- v. The DLPO office to assist farmers source breeding stock and encourage local multiplication of high quality sheep within farms.

d) Goats

Goats provide red meat and skin. Large herds are found in lower Moiben and Soy Divisions. There are few dairy goats kept due to their unavailability. The trend for goat population is as follows:

Table 13: Population trends of Goats

Breed of Goats	2003	2004	2005
Meat	76772	75492	76549
Dairy	278	267	283
Total	77050	75759	76832

Major constraints include:

- i. Lack of dairy goat breeding stock
- ii. Poor husbandry practices
- iii. Inbreeding
- iv. Poor housing
- v. Worm infestation

Possible Solutions

- i. Encourage dairy goat multiplication within the district through individual farmers or organized groups. The DLPO to identify reputable sources within and outside the district.
- ii. Educate the farmers on good husbandry practices (focus on housing, disease control, hoof trimming and feeding).
- iii. Train the farmers on proper breeding programmes.

e) Poultry

Commercial poultry has been practiced in urban areas but it is now spreading to the rural areas. The population trends are as follows:

Table 14: Poultry population trends

Type of poultry	2003	2004	2005
Indigenous	512326	449346	494281
Layers	33789	30695	55768
Broilers	21175	48075	52883
Turkeys	2430	1720	1892
Geese	919	2026	2229
Ducks	4008	2219	2441

Challenges/Constraints

- i. High input cost
- ii. Unpredictable and disorganized market
- iii. Disease and outbreaks
- iv. Inadequate adoption of technologies leading to poor management practices
- v. Acute shortage of day old chicks

Recommendations and opportunities

- i. Continuous touring and demonstrations on proper husbandry
- ii. Formation of poultry lobby groups
- iii. Strengthen collaboration among all relevant stakeholders
- iv. Train farmers to formulate feeds
- v. Encourage investors to establish a hatchery locally.

f) Pigs

Breeds include large white, landrace and their crosses. Free range is practiced within the municipality despite efforts by the municipal council to control it. There is better management in the rural areas. The pig population trends are as follows:

Table 15: Pig population trends

Division	2003	2004	2005
Ainabkoi	1033	1060	953
Kapsaret	3274	3380	2638
Kesses	617	617	370
Moiben	1560	1515	915
Soy	631	414	396
Turbo	875	472	503
Farmers Choice	2060	2295	3100
Total	10050	9753	8875

Major Constraints	Possible solutions
Poor marketing and low prices	<ul style="list-style-type: none"> • Farmers to make contracts with Farmers Choice, Chefs and Alpha Foods. • Form cooperative • Expand local butcheries • Sensitize farmers on marketing outlets • Promote pork eating
Diseases	<ul style="list-style-type: none"> • Train farmers on disease control and hygiene
Lack of superior breeding stock	<ul style="list-style-type: none"> • Farmers to be advised to get breeding stock from farmers choice
High feed prices	<ul style="list-style-type: none"> • Train farmers to formulate feeds • Form lobby groups
Lack of initial capital	<ul style="list-style-type: none"> • Farmers to be educated to source credit fro AFC, e.t.c.
Social cultural and	<ul style="list-style-type: none"> • Continuous sensitization and promotion of pork through

Major Constraints	Possible solutions
religious beliefs	<p>demonstrations in collaboration with the home economics division.</p> <ul style="list-style-type: none"> • Expose farmers through tours and field days.

g) Donkeys

These are kept as beasts of burden for farm produce and water mainly in Kesses, Moiben, Soy and Ainabkoi divisions. The trends are as follows:

Table 16: Donkeys population

Year	2003	2004	2005
Total	2312	2735	3007

Constraints

- i. Lack of proper handling equipment
- ii. Inadequate feeding
- iii. Poor breeding programs
- iv. Poor husbandry practices

Possible Solutions

- i. Educate farmers on the recommended equipment
- ii. Encourage farmers on proper feeding
- iii. Educate farmers on breeding programs

2.4.4 Regulatory and Institutional Arrangements

Livestock rearing is governed by the Agriculture Act this part of the law is implemented by the livestock production and training department. Extension officers man the location and sublocations who bring services down to the communities. There are many stakeholders and supporters of this sector including KARI, Etang Kenya, LVEMP, World Vision, ACK, KENFAP, Empowering Live International, Farming Systems of Kenya/Action Aid, poverty reduction projects and NALEP.

Key Environmental Issues

Overstocking, especially in cattle, sheep and goat rearing leads to environmental degradation. Disease outbreaks sometimes affect people through eating meat.

Proposed Interventions

- i. Education of farmers on the importance of carrying capacity
- ii. Demonstrations during ASK shows and field days
- iii. Quarantine for disease spread control
- iv. Vaccinations and treatment of livestock

Table 17: Types and status of livestock production systems

Type	Location	Livestock Products	Status Current production level	Potential production level	Challenges	Proposed interventions
Dairy	Whole district	Milk	126.4(MT)	High	Poor roads, market and feeds	
Beef	Moiben, Soy	Meat	-	High	Poor feed	Feed supplements Grow fodder crops
Poultry	Whole district	Eggs, Chicken	-	High	Diseases, poor chick management, high cost of inputs, labour intensive, chick availability	Educate farmers on management practices Local feed formulation Establish local hatchery Collaboration and group formation
Sheep	Whole district, higher pop. In Ainabkoi and Kesses divisions	Mutton Wool Hair Slans	66467520/ - 10304kg - 76249kg	High with good incentives	Poor market, Low prices, low wool quality, poor disease control, poor housing,	Organized groups for market purposes Form cooperatives Educate farmers on

Type	Location	Livestock Products	Status Current production level	Potential production level	Challenges	Proposed interventions
					inbreeding,	management Introduce high quality breeding stock Re-open stalled textile industry
Goats	“	Meat Milk Slans	22842000/ = - 45321kg	High	poor breeding stock,diseases, poor management	Improve breeding stocks Education on management practices
Donkey	Mainly in Moiben, Ainabkoi and Soy Divisions	Labour	-	-	Management handling equipment	Education
Bees	Scattered in the disstrict	Honey Wax	218599kg 23753kg	High	Adverse weather, high demand Extraction and processing	Supplement feed e.g water with sugar Plant more flower trees and other plants Education on extraction and processing
Pigs	Whole district, highest population in Kapsaret	Pork	18381600	High	Breeding stock, full range grazing	Get breeding stock from farmers choice, Education on management

Type	Location	Livestock Products	Status Current production level	Potential production level	Challenges	Proposed interventions
						, Law enforcement

Table 18: Summary: Estimated animal population Figures per division

Division	Dairy Cattle	Bef Cattle	Hair sheep	Wool sheep	Meat goats	Dairy goats	Local chickens	Exotic chickens	Pigs	Rabbits	Donkeys	Loghivies	KT BH	Langstroth
Ainabkoi	119 525	119 52	465 0	504 0	340 7	230	411 56	175 26	95 3	244 7	643	200 0	268 0	40
Kapsaret	289 95	289 6	282 8	161 3	304 3	15	663 24	331 19	57 38	623	36	159 0	162 0	40
Kesses	427 81	427 8	264 0	147 60	340 0	0	852 63	154 75	37 0	-	707	258 0	126 0	32
Moiben	723 99	724 0	394 8	144 8	459 42	18	102 31	122 86	91 5	538	1020	204 0	159 0	70
Soy	447 11	446 8	347 2	181 7	166 76	0	883 20	148 60	39 6	392	567	304 0	960	726
Turbo	373 00	373 3	630 5	814	436 4	20	110 897	153 88	50 3	409	34	158 0	670	330
Total	345 677	345 67	238 43	254 92	768 32	283	494 281	108 65	88 75	481 5	3007	128 30	858 0	1238

Table 19: Livestock Population trends

Year	Dairy Cattle	Beef Cattle	Hair sheep	Wool sheep	Meat goat	Dairy goat	Local chickens	Exotic chickens	pigs	rabbits	Donkeys	Log hives	KT BH	Lan gstr oth
2003	325200	81300	98750	18317	78750	274	512326	74367	10055	4680	2312	11452	8401	448
2004	342636	34278	10802	22391	75759	278	449546	78740	9753	5141	2735	11312	8330	654
2005	345672	34567	11604	25492	76549	283	494281	86648	8875	4815	3007	12830	8580	1238

2.4.5 Pollution and Wastes in Livestock Production

Table 20: Sources of Pollutants

Pollutant/Waste	Source
Animal droppings	Animal sheds, slaughter houses, grazing areas
Acaricides	Dips, home spraying
Carcasses	Animal death
Plant remains	Feeding troughs

Animal droppings form manure used on farms for crop production. The same applies for plant remains, which are normally left to decompose on farms or in compost heaps. Carcasses are normally buried. The main pollution from livestock comes from acaricides. Dips are strategically placed near sources of water. When they are drained, the effluent is normally channeled to a sock pit designed by a livestock officer. Underground water pollution cannot be ruled out.

Key environmental issues are water and air pollution caused by acaricides. Proposed interventions include education in handling the chemicals and using facemasks when spraying. Draining dip effluent into the soak pit allows for natural filtration before getting into ground water system.

2.5 Fisheries resources

There are two types of production systems in the district

- Ponds
- Dams

2.5.1 Status of Fisheries Development and Trends in Ponds

No. of fish farmers – 143

No. of fish ponds - 277

Area of operational ponds – 5170m²

Annual average production – 8000kg/year

Dams

No. of dams – 100

Average annual production-3000kg/yr

Table 21: Fisheries Production Patterns

YEAR	PRODUCTION SYSTEM	TOTAL PRODUCTION(KG)
2001	Ponds	2000
	Dams	500
2002	Ponds	3500
	Dams	1500
2003	Ponds	3100
	Dams	1500
2004	Ponds	4600
	Dams	2200
2005	Ponds	8000
	Dams	3000

2.5.2 Regulatory and Institutional Arrangement

Fisheries resources are regulated by the Department of Fisheries.

Table 22: Types and Status of Fisheries Production Systems

Type Of Production System	Location	Status-Current Production	Potential Production Level	Challenges	Proposed Interventions
POND	Throughout the district	8000kg/yr	20,000kg/yr	Low level of management	Training of fish farmers on intensive level of management Intensive extension services
DAMS	Throughout the district	2300kg/yr	2000tons	Lack of awareness Need for stocking	Stocking of dams

Key Environmental Issues and Interventions

Prioritized Issues/Challenges	Current Intervention	Proposed Intervention In The Plan Period	Responsible Institution	Remarks
Development of aquaculture	Extension services Training of fish farmers Recruitment of new fish farmers	Development of seed production center Development of model fish farm for training purposes	Fisheries Department	Subject to availability of funds
Optimum	Training of the	Re	Fisheries	

Prioritized Issues/Challenges	Current Intervention	Proposed Intervention In The Plan Period	Responsible Institution	Remarks
exploitation of dams	community	connaissance survey Stocking of dams Management of Dams	Department	
Development of ornamental fish culture for export	Training of fish farmers	Establishing a marketing system	Fisheries Department	

2.6 Water resources

2. 6.1 Water Sources

1. There are about 250 boreholes in the district, of which 170 are registered.
2. There are eight (8) permanent rivers with numerous streams and springs.
3. The no. of shallow wells is equaled to no. of homes in the district because in every home there is a shallow well.
4. There is only one (1) wetland which is on trust land but numerous wetlands are found on private lands.
5. The main water towers in the district are kaptagat, Timboroa and Kapchemutwa forests.
6. The district is drained by rivers Moiben, Sosiani, and |Sergoit river all of which drain to river Nzoia and lastly to Lake Victoria.
7. The water resources of the district are highly depleted due to deforestation and over abstraction.
8. WRMA is in the process of restoring catchment areas by afforestation and also it is the process of regulating usage of water to avoid abuse.

2.6.2 Main Water Uses

1. A bigger percentage of water use in Uasin Gishu is for domestic purposes. Floriculture and horticulture are picking up and use a significant amount of water because they are mainly grown in green houses.
2. Various industries are found in Eldoret or are coming up due to its abundant supply of water.

2. 6.3 Status and Trends of Water Resources

Due to increase in population growth, there is a great demand for fertile agricultural land. This has led to encroachment of river banks causing depletion and pollution of the water resources.

2.6.4 Access to safe Drinking/Portable Water

Percentage of population in this area who have access to pure drinking/portable water is 42%but about 90% of the population have access to water resource within a 2km radius.

2.6.5 Impact of Water Use and Demand on the Environment and Natural Resources

Due to unreliable rainfall pattern, the population have encroached on rivers banks, wetlands, catchment areas, e.t.c. which has degraded the environment and natural resources. These have resulted to siltation of our dams (reservoirs), the depletion of our water resources and hence pollution of the same.

Environmental Issues in Management and Utilization of Water Resources

There are conflicts over sourcing and use of water from the following sources.

1. Moiben catchment – Chebara dam
2. Usalama dam
3. Kipkaren Dam
4. Osorongai dam
5. Kerita dam between school and community.

Proposed Interventions

The Water Resource Management Authority is in the process of legalizing all abstraction to avoid abuse which leads to conflicts due to over abstraction. The authority is also assisting communities to form water resource user associations, which will be dealing with conflicts and management of catchments.

2.6.8 Regulatory and Management Arrangements

Eldoret water and Sanitation Company within Eldoret Municipal Council is charged with the responsibility of supplying water within the municipality. The company also takes charge of sewerage treatment.

Before the restructuring of the water ministry, the ministry was responsible for water supply outside the municipality. A number of intakes are in place. On restructuring, there is provision for the formation of associations as water providers. This is yet to be adopted in the district since it is still a new idea. The department is also to enter into partnerships for the restoration and conservation of catchment areas.

2.7 Forestry

2.7.1 Types of Forests

There are two types of forests in Uasin Gishu District: plantation and natural forests (indigenous).

Plantation forests are dominated by exotic tree species like *cupressus lucitanica*, Eucalyptus and pines on a large scale while others are used for ornamental, fodder and conservation purposes.

Natural forests are dominated by drier highland species like *Juniperus procera*, *Olea africana*, and *podocarpus gracillior*. *Acacia meansii* (black wattle) is a cash crop in Kapsaret and Soy regions(former EATEC farms). *Grevillea robusta*, *Markhamia platycalyx*, *spathodea nilotica*, *Teclea nobilis* and *Olea hochstetteri* are dominant in Soy region.The Timboroa region, which is cool and wet and with frequent frosts is dominated by mountain type tree species of *bamboos* and *podocarpus* forests.

Table 23: Area under Forest Cover (gazetted)

Name of Forest	Area (Ha)		
	Plantation	Natural	Total
Nabkoi	2,979.50	4,618.79	7,598.29

Timboroa	2,655.00	3,209.13	5,874.13
Lorenge	1,622.32	2,483.46	4,105.78
Kipkurere	2,914.52	2,938.85	5,853.37
Cengalo	2,034.00	2,987.50	5,021.50
Kapsaret	9,68.00	318.5	1,349.50
Total	13,183.34	16,619.23	29,802.57

2.7.2 Status and trends of Forest Resources

Status:

Forests in the district are classified into two major categories, namely

- i. Government (central) forests. These include Nabkoi, Timboroa, Cengalo, Lorenge, Kipkurere, and Kapsaret Forests.
- ii. Private forests. These include farm woodlots and portions of the forest cover of the remaining former EATEC farms.

Trends

Forest resources are diminishing at a high rate due to the following factors:-

- i. Population pressure that has led to a high demand of the forest resources e.g. construction, wood, fuel wood, e.t.c.
- ii. Forest excisions by the government for settlement e.g.in the year 1993, the government settled about 355 families in an area of 740 ha in Cengalo Forest(Cheboror Farn LR No. 24644)
- iii. The rate at which trees are felled is much higher than the trees replanted.
- iv. Forest encroachment e.g. in Kipkurere Forest, about 500 ha of indigenous and plantation forests have been cleared by illegal squatters.
- v. Forest fires as the region is in a high fire risk zone.
- vi. The selling of the former EATEC farms to individuals who have cleared the forests paving way for agriculture and industrial development.

2.7.3 Regulatory and management arrangements

- i. The government has imposed a moratorium on tree harvesting in gazetted forests.

- ii. Issuance of forest produce permits to regulate tree felling both in private and government forests.
- iii. Awareness campaigns on forest conservation and inclusion of all stakeholders in the management of forests.
- iv. Drawing and implementing forest management plans.
- v. Regular forest patrols and policing
- vi. Legislation (forest act) to control the management
- vii. Forest policy that guides the management.

2.7.4 Exploitation of Forest Resources for Timber and Non Timber Products

- i. Exploitation in gazetted forests is done by only two companies, which were exempted from the ban, these are PPM (EA) Ltd for pulp and paper production and Rai Plywoods for plywood production.
- ii. Exploitation of timber products which are used locally is done on private farms, while non timber products such as honey, fruits, forage, and medicinal plants are obtained from both private and government forests.

Key Environmental Issues

- i. Soil erosion due to deforestation
- ii. Change in micro-climate
- iii. Loss of habitat for flora and fauna
- iv. Strong winds

Proposed Interventions

- i. To develop, conserve and protect forests, trees, and forestry resources sustainably for socio-economic development.
- ii. Managing the wood production areas for maximum yields so that the different needs for wood can be met using the smallest possible area of forest land.
- iii. Introduction of fast growing species e.g. improved species of Eucalyptus
- iv. Forest extension services to rural communities

2.7.5 Forest uses

- i. Soil and water conservation
- ii. Herbal medicine
- iii. Paper, pulp and plywood production
- iv. Climate amelioration
- v. Construction wood
- vi. Energy (wood fuel)

- vii. Bio diversity conservation
- viii. Education and training
- ix. Forage

2.8 Biodiversity conservation

Research on 39 wetlands recorded a diversity of organisms, varying in size, type and abundance. The organisms were classified as follows:

- a) Macrophytes
- b) Planktons
- c) Mammals
- d) Birds
- e) Reptiles
- f) Amphibians
- g) Fish
- h) Aquatic invertebrates

a) Macrophytes

A variety of these have been recorded wetland and non wetland species as well as emergent wetland species. Examples include

Species Name	Category
Apium leptophyllum	non wetland
Bidens pilosa	non wetland
Cyperus spp.	wetland emergent
Typhae latipha	wetland emergent
Indisigia leptocarpa	wetland emergent
Nympae nonchali	wetland floating leaved

Food crops include maize, wheat, potatoes, peas, beans, and a variety of vegetables. Forest vegetation includes both indigenous and exotic species and these can also be planted on farms. A variety of grasses can also be found.

b) Birds

About 6000 bird species have been recorded. Birds act as bio-indicators and could be used to monitor aspects of environment like water quality and devegetation. Common birds are:

Name	Habitat	Activity
Anas hottentpta	dam edge	perching
Alopochan	open shallow water	wading
Scopus umbrella	muddy shore	feeding
Rodica senegalensis	open water	wading
Columba guinea	shrubs around dam	perching
Bubucus ibis	short grass around dam	feeding
Quelea quelea	farm fields	nesting/feeding
Crested crane	expansive swamps	feeding

Other birds include chicken, ducks, geese, turkey, doves, crows and guinea fowls.

c) Amphibians

In the 39 wetlands, about 322 amphibians were recorded. Common ones include:

Name	Habitat
Hylambates	Shallow water ponds
Rana Witter	Shallow Pond
Ptydiadena mascamuis	wet soil
Xenopus laenis	water edge
Hyperolrus viridiflanus	grass straws

d) Planktons

25 species were recorded in the 39 wetlands. These include:

i) Phytoplanktons

Name	Habitat
Centronella spp.	Regular
Asterionella spp.	Common
Aphanocopsa spp.	Extremely common
Synedro spp.	Occasional
Protococcus spp.	Occasional

Microsterias spp. Extremely rare

ii) Zoo planktons

Lepidocaris spp. Extremely rare

Cyclops spp. Regular

Filina longisita Occasional

e) Mammals and Reptiles

Mammals

These are not confined to any one particular habitat. They include cattle, sheep, goats and rabbits. Others are Rothschild giraffe, antelopes, elephants (at the border with Nandi South and uncommon), rodents like rats and squirrels. Mongooses are also found as well as the domestic cats and dogs.

In the district, there are some rare and threatened species like the Rothschild giraffe which is currently being conserved at Krugger Ranch, Sergoit area. The elephant is also threatened and only confined to the border with Nandi in Lorenge and Kipkurere forests. Most wild species are threatened because they are either dangerous to human beings (like snakes) or a threat to crops and livestock.

The district being agricultural, most animal and plant species have lost their habitats to cultivation. There is not much in terms of conservation efforts. Remarkable, however, is the establishment of the private Krugger Ranch in Sergoit which is now home to the rare Rothschild giraffe a number of reptiles and antelopes intended for tourism. Moi University is establishing a conservation site at Chepkoilel campus for plants and animals. Tree species are conserved in gazetted forests and through establishment of woodlots, tree nurseries and on farm planting. Wild vegetables have been domesticated e.g. Suja, sagaa. Little effort is put towards food crops conservation of indigenous variety.

f) Reptiles and Fish

Various species of snakes, lizards and tortoise and turtles. Fish is mainly in man made ponds and dams. They are getting extinct in rivers due to pollution. The most commonly found is tilapia.

Key Environmental Issues

These include:

1. Low awareness on bio diversity conservation
2. Deforestation as a result of rampant logging, cultivation, settlement and charcoal burning.

3. Agriculture – Indigenous species are eliminated through cultivation and farm clearing through burning.
4. Annual wetland burning by local communities
5. Introduction of exotic species mainly in Forestry and agriculture in preference to indigenous.
6. Pollution in water affecting aquatic life.
7. Poverty

Proposed intervention measures include

1. Setting up arboretums for species conservation
2. Education of the public
3. Encourage domestication and propagation of wild vegetables and fruits
4. Preservation of water catchment areas and enriched by planting more indigenous species
5. Domestication of biodiversity conservation plans.
6. Creation of recreation sites
7. Encourage tourism in the district
8. Support ongoing conservation efforts like the Krugger ranch and Naiberi campsite.

Table 24: Types & Status of Biological Resources

Ecosystem		Location and size	Key species	Threats	Status			Proposed interventions
					Rare	Threatened	Vulnerable	
Gazetted Forests	Indigenus	Nabkoi – 4618.79 Timboroa – 3209.13 Lorengere – 2483.46 Kipkurere – 2938.85 Cengalo – 2987.53 Kapsare t - 318.5 Total – 16619.23	J.procera Olea africana Bamboo	Excision Over exploitation Fires Overgrazing Slow regeneration Poor silvicultural management		Threatened	Vulnerable	Integrated forest management Alternative energy sources(cheaper) Implement PRSP Law enforcement
	Plantation	Nabkoi – 2979.50 Timboroa - 2665.00 Lorengere – 1622.32 Kipkurere – 2914.52 Cengalo – 2034.00 Kapsare t – 918.00 Total – 13,183.34	Eucalyptus Cypress Pine	Insects/pests Over harvesting Planting backlogs Fire Poor silvicultural management		Threatened		Improve extension services

Ecosystem		Locati	Key	Threats	Status			Proposed
	Private Forests		Black wattle Teclea nobilis Grevillea robusta Spathodea nilotica Makhamia Olea hochsteterii Eucalyptus	Over exploitation for timber and charcoal		wattle		Incentives Technical advice especially in tree management
Agricultural		204,000 ha	Maize Wheat Beans Sorghum Pyrethrum Potatoes Peas Vegetables Cattle Sheep Goats poultry	Maize stock borer Weevils Drought Monoculture Diseases Theft drought	Beans Sorghum	Pyrethrum Cattle	Potatoes Cattle, poultry	Improve farming methods Integrated pest management Use of certified seeds Improved market, (especially for pyrethrum) Crop diversification
Wildlife areas		Krugger Ranch, Sergoit Moi University recreation site Eldoret cultural site	Rheedbuck Giraffes Oribi Jackal Porcupine Birds Rodents Snakes Tortoise Fish Snakes Ostrich Crocodiles		Rotschild giraffe	Private and protected	Private and protected	Community and government Support
Inland waters and wetlands		Scattered	Papyrus reeds Frogs Birds Syzigium	Encroachment Catchment destruction Siltation Pollution	Crested crane	All wetland species	All wetland species	Wetland policy Enforcement of existing laws Education

Ecosystem	Locati	Key	Threats	Status	Proposed
					on wise use of wetlands Increase catchment afforestation

Table 25: Key Environmental Issues and Proposed Interventions

N o.	Prioritized Issues/challenges	Current intervention	Proposed intervention on the plan Period	Responsible Institution	Remarks
1.	Low awareness on biodiversity conservation	Sectoral Approach	Integrated and joint awareness creation use of mass media Domestication of MEAS	All environmental stakeholders	
2.	Deforestation	Forest law LVEMP – Catchment afforestation	More stakeholder involvement Implementation of new forest law	Community Forest Department	
3.	Agriculture	Extension services	Discourage burning Adopt indigenous trees as AF spp. Woodlots on farms	Min. of Agriculture Community	
4.	Annual wetland burning by local communities	None	Wetland policy required Public awareness creation on importance of wetland and their wise use	Agriculture Forest Water Fisheries OP NEMA	
5.	Introduction of exotic species	Use of certified approved seeds/breeds	Create awareness on importance of conserving indigenous species Forest department to increase acreage under	Agriculture Forest NEMA Community	

No.	Prioritized Issues/challenges	Current intervention	Proposed intervention on the plan Period	Responsible Institution	Remarks
			conservation area(indigenous forest)		
6.	Pollution	Awareness creation	Lawenforcement, Constant monitoring of water quality and proper documentation Increase awareness creation	Water Department, ELDOWAS	
7.	Poverty	PRSP strategies for economic recovery	Support micro projects for communities Encourage more CBOs	Lead agencies NGOs CBOs National policy makers	

CHAPTER THREE

3.0 HUMAN SETTLEMENT AND INFRASTRUCTURE

Human Settlements are viewed as human habitats and the linkages with areas where man derives his livelihood. Human settlements do not exist in isolation they are linked to activity areas and functions such as education, commercial, industrial, recreational, residential among other users together with infrastructural units. The Government Policy on human settlement is viewed in terms of shelter and housing which is to ensure adequate shelter that provides protection from the elements of weather as well as security, privacy and space for socio-economic activities for the advancement of the quality of life. There are two types of human settlements, the urban and rural settlements.

3.1 Human settlement and planning

3.1.1 Urban Settlements

According to the 1999 population and Housing censuses, the population of Uasin Gishu District was 665,000 persons with an annual growth rate of 3.5% per annum. The population was projected to 690,037 persons in 2002 and is expected to grow to 1.4 million people by the year 2022.

In terms of urban settlements, Eldoret town is the principle urban centre in the district with an estimated population of 216,356 as per the National Population census. Other major towns and corresponding urban population are Burnt Forest, Moi's Bridge and Matunda with residential population of 33,055, 23,936; 12,288 people respectively.

Eldoret town exerts a lot of influence as far as urbanization in Uasin Gishu District is concerned. It accounts for about 22.25% of the total population in the district. Burnt Forest has 26.12% of the population, Moi's Bridge 17.59% Matunda 6.05%, and Turbo 2.3% the district's total urban population is 27.73% meaning that the vast majority of the people reside in the rural area.

The areas within which the major towns and small centres occupy fall within land which is held on leasehold tenure of which many of them have been planned. Table 3.1 indicates the number of towns and centres and Physical Planning status (see appendix).

3.1.2 Problems of urban settlements

The major problems confronting the growth and development of towns and small centres in the Uasin Gishu district include;

- Lack of infrastructure e.g. water, electricity, sewer and good roads
- Poor housing/mushrooming up of unplanned structures
- Pollution arising from dumping of wastes
- Encroachment of riparian reserves and wetland areas
- Traffic congestion especially in Eldoret town
- Poor drainage
- Uncertainty of land tenure
- Squatter settlement problems e.g. on Langas
- Inadequate provision of public utilities
- Expansion of urban centres into prime agricultural land

Key Environmental Issuers and Proposed interventions

The strategies and mitigation measures to address the negative environmental impacts of urban human settlements are outlined as follows:-

Issue	Causes	Solution	Actors
Pollution	Dumping of wastes	Adoption of an effective waste disposal system	Local Authorities Government Departments
Encroachment of riparian reserves and wetland areas	Allocation of plots near riparian reserves	Revoking of plots within riparian reserves Protection of rivers and wetlands	Ministry of Environment Local Authorities Government Departments NGOs CBOs
Poor Drainage	Interference of natural drains Blockage of drains	Opening of drains	Local Authorities Government Departments
Urban plight shanty eyesore character	Poor planning lack of development	Zoning upgrading	Local Authorities Physical Planning

Issue	Causes	Solution	Actors
	control		NEMA NGOs CBOs

3.1.3 Rural Settlement

Settlement patterns in Uasin Gishu District are dominated by rural homesteads which dot the country side. Settlements in Moiben Division are sparsely distributed due to the effect of the dry spell and harsh climate conditions. The cluster types of settlements are mainly found in Turbo and Kapsaret Divisions. The factors that have influence settlement factors include;

1. climate
2. infrastructure availability e.g. good roads, water sources
3. large scale farms
4. land potentiality

Unlike urban settlements, rural settlements fall in areas with security of tenure. The housing typologies in the rural areas of Uasin Gishu are mainly permanent, and semi-permanent housing with many houses being made of grass thatched and mud-walled materials. A common feature of rural settlements is the presence of stores which are used to store farm produce.

3.1.4 Problems of Rural Settlements

Environmental problem in rural areas are not so critical as compared with urban agglomerations. The issues under consideration include:-

- Poor housing
- Encroachment of rural settlements on forest areas e.g. Turbo Forest
- Devegetation due to demand for wood fuel.

The proposed intervention measures for the problems associated with rural settlement patterns include:-

- Sensitization of rural inhabitants on the need to adopt modern housing designs.
- Encouragement of the land owners to practice agroforestry farming and to set aside part of the farms for tree planting.

- Sensitization of the rural people to adopt the use of other alternative sources of energy such as solar energy, biogas and electricity among others.

3.3 Human and Environmental Health

The common diseases influenced by environmental factors in the urban and rural landscapes can be categorized as follows:-

1. Water borne infections

This is a group of infections which the disease causative agents are transmitted through water or food and the same include enteric fever *salmonellosis* *E. coli*

2. Water based infections

Are infections which the causative agents live and breed in water e.g. Bilhazia guinea worms.

3. Water related infections

Are infections which its vectors breed at a water body and infects man away from the water body e.g. malaria and river blindness.

4. Water washed infections

These are an infection which affect man due to lack of water or contamination of water and includes scabies, trachoma, and leishmaniasis.

5. Diseases that come about due to pollution of drinking water e.g. cholera and amoebiasis.
6. Diseases that arise due to poor post harvesting and storage of food stuffs thus leading to food poisoning e.g. aflatoxicosis.
7. Diseases that are caused due to poor housing and sanitation e.g. tuberculosis.
8. Diseases that are caused due to poor disposal of water hence leads to breeding of diseases vectors e.g. house flies hence transmissions of diarrhoeal diseases.
9. Diseases that are caused due to poor disposal of animal products and wastes e.g. anthrax and tetanus

3.3.1 Intervention measures to address the prevalence of diseases

As a strategy for addressing the prevalence of diseases in Uasin Gishu district, the following measures are recommended:-

- Provide access for safe drinking water for all
- Zoning of urban areas to curb the problem of mushrooming up of slums in towns
- Regulate use of agro-chemicals and green houses

- Promotion of afforestation programmes to check on the problem of land degradation and disasters such as flooding and extreme weather conditions.
- Stepping up measures for environmental improvement in order to curb the problem of massive breeding of diseases vectors
- Carrying out Environmental Impacts Assessments and Environmental Audits for installations which are likely to cause chemical pollution and radiation hazards
- Routine inspection of buildings to ascertain habitability and to address the issue of indoor air pollution i.e. poisonous gases
- Monitoring and eradication of emerging and re-emerging of diseases
- Sanitization of members of the public on the importance of primary health care

3.3.2 Pollution and waste generated from human settlement

Pollution is an important environmental concern in Uasin Gishu District. The district experiences air and water pollution, fires, charcoal burning, dust particles and emissions from agro-based industries which cause air pollution.

The sources of water pollution include silting due to soil erosion and industrial chemical deposits into water bodies. Increased use of plastics today has a severe effect on the scenery of urban environment.

3.4 Social economic services and infrastructure

In Uasin Gishu District, urban areas are adequately served with all manner of infrastructure facilities and services. These include water supply, power supply and sanitation services.

In terms of access to water and sanitation services, it is estimated that only 40,926 households have piped water supply while 103,064 households have access to potable water. To alleviate the problems of inadequate water supply over 5,488 families use roof catchments. It is also estimated that VIP sanitary facilities are used by 5,785 families as means of waste disposal (DDO 2002).

Other sources of water and their corresponding quantities in Uasin Gishu are indicated as follows:-

Source of Water	Number
(i) Wells	67,804
(ii) Rivers	7
(iii) Protected Springs	450
(iv) Dams	75
(v) Ponds	450
(vi) Boreholes	13,039

Proposed intervention measures

It is recommended that all activities that contribute to air pollution should be regulated and be subjected to Environmental Impact Assessments and audits. On the issue of charcoal burning, alternative sources of energy should be encouraged e.g. the use of solar energy, biogas and windmill among others.

Other strategies to environmental pollution include:-

- Desilting of dams
- Recycling of garbage
- Use of biodegradable materials
- Acquisition of appropriate sites for waste disposal
- Provision of sewerage sanitation for urban settlement
- The district has several types of water facilities ranging from boreholes, furrow, rivers, wells and

3.5 Energy sector

The Ministry of Energy is the key Government Agency charged with responsibility of facilitating development geared towards supply of adequate and reliable energy sources to support socio-economic development. To serve this mandate, the ministry is currently pursuing activities to ensure adequate supply of energy in the country this includes promoting conservation of all forms of energy, intensify exploration and development of fossil fuels, Geothermal and hydro-electric power, increasing on – farm wood fuel production efficiency in wood utilization and promoting the development of alternative energy sources.

The ministry plays a highly facilitative role in energy supply. It plays a leadership role in development of policy, legal and regulatory framework, overseeing and ensuring provision of reliable and adequate energy and distribution through supervision of services providers, specifically State Corporation

3.5.1 Types and Status of Energy Services

The types of energy available in the district include: -

1. **Wood fuel:**

Wood fuel has remained the most important source of energy accounting for over 70% of the total energy demand in Kenya. 80% of the population depend on it for domestic energy needs, providing over 90% of rural households' energy requirements. Sources of wood fuel are declining because of destruction of vegetative cover.

(i) Charcoal: Charcoal is a semi-refined wood fuel made from the carbonization of wood in the limited air. This form of energy is used in the district mostly by low-income urban residents and in the rural by mainly high-income groups and people with employment in addition to farm income. The resource is declining as some of the producers of the commodity have closed down e.g. EATEC

2. **Farm residue**

Farm residue comprises of a broad range of vegetative materials generated from diverse agricultural operations and process. Dung and crop residue are dominant by products from primary agricultural production, which are occasionally used as domestic fuel in the district. The resource is abundant especially during harvesting season.

3. **Wood waste**

Wood waste includes sawdust, timber rejects, off-cuts and others. This has declined with the closure of sawmills.

4. **Kerosene**

Kerosene is used by almost all households in the rural for lighting. The resource is available with high costs with the government exempting it from taxation to lower its price.

5. **LPG (Liquefied Petroleum Gas)**

This resource is used in the district by urban residence. The resource is available with high cost.

6. **Electricity.**

Electricity is the most modern and convenient fuel and ranks highest in the energy ladder. However, electricity is expensive for the majority of households. Urban households have easy access to electricity unlike the rural where few households have access to it due to the distance from the National grid.

7. Solar

Few households in the rural use it for lighting due to cost of the technology appliances.

8. Biogas

This is used by few individuals and institutions in the district. This resource is not widely used because of its initial costs of the unit set- up.

9. Wind power

Wind power like Biogas is used by few individuals for water pumping and this is largely because of the costs involved in installation.

3.5.2 Trends in Energy Production, Consumption, Costs and Projections

Electricity is second to petroleum fuels as a source of energy to commercial and industrial establishment as well as institutions and households in the country.

HYDRO	INSTALLED CAPACITY
	(MW)
Tana	14.4
Wanji	7.4
Kamburu	91.5
Gitaru	225
Kindaruma	40
Masinga	40
Kimbere	144
Turkewel	106

3.5.3 Geothermal

Olkaria I	45
Olkaria III	8

Table 26: FACTORS INFLUENCING ENERGY GENERATION

ENERGY TYPE	FACTORS INFLUENCING GENERATION
Electricity	<ul style="list-style-type: none">- Weather conditions (Drought)- Siltation in dams- Deforestation.
Solar power	<ul style="list-style-type: none">- Weather conditions (Cloudy seasons)
Wind power	<ul style="list-style-type: none">- Weather conditions (Wind)

ENERGY TYPE	FACTORS INFLUENCING GENERATION
Petroleum	<ul style="list-style-type: none"> - Importation pricing - Refinery for lead fuels - Exploration.

3.5.4 Factors influencing trends

- a) Population growth
- b) Over grazing
- c) Deforestation
- d) Out dated technology

Key Environmental Issues

- Use of firewood and charcoal leads to increased destruction of the district forest cover.
- The need for firewood to fire boilers in tea factories has lead to encroachment of wetlands for planting of eucalyptus species.
- Oil spillages from service stations, automobile garages, vehicles, factories pollute soil and water.
- Petrol and other fossil fuels contain heavy metals which are harmful to man.
- Use of kerosene, charcoal-making results in harmful gases such as carbon monoxide emission, which contribute to depletion of the ozone.
- Widespread use of polythenes and plastics in the packaging of charcoal, kerosene and other fuels result in increased environmental pollution when plastics/polythenes are not properly disposed.

Proposed Interventions

- Increase public awareness on good environment practices.
- Intensify tree planting campaigns
- Encourage use of unleaded fuel
- Increase security patrols to ensure no encroachment on public/gazetted forest
- Timely collection and proper disposal of wastes-polythenes and plastics.

CHAPTER FOUR

4.0 INDUSTRY, TRADE AND SERVICES

4.1 Industrial sector

Uasin Gishu is not highly industrialized and most industries are agricultural based.

The types of industries are as follows:

- i) Processing
- ii) Manufacturing
- iii) Engineering and construction
- iv) Jua Kali
- v) Cottage

Industrial development has been on the decline with factories closing for lack of raw materials and political good will.

The main industries are as follows:

Table 27: The main Industries

Processing	Manufacturing	Engineering and construction	Jua Kali	Cottage
Oil Dairy Unga mills Wood based Corn products	Bakeries Wood based Textile Soft drinks	Steel mills Farm machinery Construction industry	Old tyre recycling Metal works Repair of households items Garages Welding Food kiosks	Garment making Confectionery & home baking, tomato sauce

Table 28: Trends in Industrial Development

Type of Industry	2001 – 2005	Remarks
Processing	5	
Manufacturing	4	Declinig
Engineering & construction	3	Increasing
Jua Kali	6	Increasing
Cottage	4	increasing

Key Environmental Issues**Table 29: Type and Impact of Industries on Environment**

Type of Industry	Raw Material	Product	waste	Environme ntal impact	Mitigation
Processing	Milk	Milk and milk products	effluent	Water pollution	Soak pits
	Cereals	Flour Animal feed syrup	dust	Air pollution	High stacks
	Sunflower	Edible oil	effluent	Water pollution	Pre treatment
	Wood	Wood products	Dust & wood pieces	Air pollution	Used as fuel
Manufacture	Flour	Bread, cakes, e.t.c.	-	-	-
	Wood	Wood products	Dust and wood pieces	Air pollution	Used as fuel
	Wool, dye, synthetic fibres	Clothing	Effluent	Water pollution	Pre-treatment and recycling

Type of Industry	Raw Material	Product	waste	Environmental impact	Mitigation
	Water, formula	Soft drinks	-	-	-
Engineering and construction	Metal, wood, glass, stones, cement, sand	Metal bars, wooden frames, buildings	Iron filings, wood and metal pieces, stone chippings, dust	Soil and air pollution, noise	Protective gear
Jua Kali	Assorted	Assorted	Unusable pieces of assorted raw materials	Soil and noise pollution	Mostly recycled, burnt
Cottage	Clothing materials	garments	Unused pieces	littering	Burnt and dumped in the municipal dumping site
	Starch + formula	Tomato sauce			
	Sugar, flour, food colours	Confectionery			

4.1.1 Industrial Wastes and Pollution

Table 30: Type and Sources of Wastes

	TYPE	SOURCE	STATUS
1.	Saw Dust	Saw mills, saw bench, Pit	Minimum waste mostly recovered and

	TYPE	SOURCE	STATUS
		sawing, Power saws, Raiplywood, carpentry shops	used as fuel and production of boards in Raiplywood. Used as fuel in some households
2.	Chemicals	Manufacturing/processing/service Industries – KCC, Doinyo Lessos, Arkay Oil Factory, Rupa/KenKnit textile factory	Manufacturing/processing release effluents which is at times not well treated/protected. Dyes in textile industries are normally recycled.
3.	Effluent	Rupa/KenKnit, Raiplywood, Arkay Highlands paper Mills, slaughter Houses and catering industry	Recycled pre-treatment done before release into municipal sewer controlled through municipal sewer.
4.	Emissions (gaseous)	Raiplywood, Eldoret steel mills, Corn products, Unga Mills, vehicles	Concentration controlled through tall stacks and improved boilers. Emissions from Eldoret Steel Mills remain heavy.
5.	Noise	Vehicles	Nuisance near residential estates and prominent at Picking points along Uganda road (main highway)
6.	Scrubblings	Jua kali	Iron fillings normally scattered on the ground, they are usually swept in the runoff.
7.	Odour	Slaughter houses	Effluent from washing released in open drains. Dung dried for manure
8.	Cut hair	Salons and Kinyozis	Disposed off in rubbish bins and end in municipal dumping ground or is burnt. Sometimes can be seen scattered along the roadside where rubbish bins are not provided.

4.1.2 Energy related pollution and waste generation

Most of the industries use electricity as a source of energy. Waste is therefore in terms of used bulbs and tubes and occasionally wires. Some use fuel wood or wood products. Examples are Corn products and Raiplywood. Ash is an inevitable waste. Gaseous emissions from the wood add excess heat; are wastes. Generators that use petrol or diesel are also used in few cases or during electricity failure. These are sources of oil spills and used oil. Currently, there is insignificant pollution generated from this source.

4.1.3 Waste and pollution from Mining and Quarrying

There are no mining activities in the district. Large commercial quarries in the district e.g. Sirikwa and Kipluge, whereas other commercial quarries in the municipality like Gituro quarry are out of operation.

Small temporary quarries are scattered in the entire district. The large commercial quarries crush hard stones to produce ballast. Most of the other quarries produce murrum which is basically used for road renovation and building foundations of permanent structures. Dust is the prime waste from this activity. Noise from the huge quarries is also enormous. Quarries are usually sited within regions of low population densities. This is done to check immense nuisance to the people. Quarry dust is an additional waste in this industry. It is used for making building blocks.

4.1.4 Emissions and Noise Pollution

No industry can be said to have significant emissions as noise pollution is localised in their processing units. Nonetheless, emissions and noise are largely experienced from the transport tracks. Eldoret International Airport is located in the outskirts of Eldoret Town along Eldoret-Kisumu road. It dismally pollutes the region. Flight frequency is still low therefore the impact of noise generated is also small.

Entertainment are offered by hospitality industry; mainly hotels that provide Casinos and discos. A disco hall at white castle hotel is situated at the basement as a result noise reaching the surrounding is minimized. On the other hand, Wagon hotel is a nuisance to its neighborhood despite the recommendations to reduce noise made through the Audit Report for the Hotel. Other areas with least activity at night also offer discos, hence they are not a nuisance to anybody around.

4.1.5 Service Industry Waste and Pollution

Table 31: Table 4-5: Types and sources of wastes

	TYPE	SOURCE	STATUS
1	Noise	Entertainment/Hospitality places, markets, transport, churches and open air meetings	Noise is periodically a nuisance. None of these sources produce harmful noise
2	Emissions	Hotels, charcoal, kilns	Minimal and scattered
3	Effluent	Hotels, laundry, slaughter houses	Mostly linked to sewerage systems Few discharge to open drains
4	Sharps, linen, bandages	Hospitals, clinics	No proper maintenance facility available. Most of waste is disposed in municipal receptacles and in dumping sites. Other wastes are burnt at hospital dumping sites
5	Expired drugs	Hospitals/clinics/chemists/pharmacies	
6	Plastics	Supermarkets, markets	Littering very common Blockage of drains present in water

	TYPE	SOURCE	STATUS
			bodies.
7	Used oils	Garages, Petrol stations	Used oil in petrol stations normally trapped and stored for sale. Garages have no proper disposal mechanism and oil is normally spilt on the ground.
8	Exhaust gases	Transport , kilns	Concentrated in main town and urban centres as well as along main highway. Kilns for charcoal scattered on farms.
9	Chemicals/lab waste	Laboratories , laundry	Released as effluent to municipal sewer. Sometimes released in open drains
10	Detergents and soaps	Laundry	Released into municipal sewer or open drains
11	Garage wastes	Garages	Metallic waste recycled. Rubber waste disposed into municipal receptacles. Used oil disposed into environment or stored for sale
12	Worn out tyres	Garages	Used in jua kali industry for making sandals, ropes etc Wires are used to make rat traps and bird cages
13	Food waste	Hotels, markets	Disposed off into municipal receptacles, dumping sites occasionally found dumped along roads/road sides and open drains
14	Used batteries	Transport, lighting sources	Dry cells normally discarded into environment
15	Packaging material	Supermarkets/ retail shops, markets	Polythene is a main problem. Plastics are normally collected for recycling. Mostly reused and finally disposed of by burning.

4.1.5 Hazardous Waste

Hazardous waste is waste that poses substantial or potential threats to public or environmental health and safety and generally exhibits one or more of these characteristics: Ignitability, corrosivity, reactivity (Explosive) and/or toxicity. While waste is unwanted or undesired solid, liquid or gaseous material left over after the completion of a process and is likely to cause attention in the environment.

Table 32: Types and Sources of hazardous Waste

	TYPE	SOURCES	STATUS
1	Medical	Hospitals , clinics, chemists, pharmacies	Facilities do not have incinerators and use open burning. Some use municipal dust bins and waste end up in dumping sites Some cases of dumping in the river have been witnessed.
2	Military	Moi barracks	Not known
3	Ozone depleting substances	Flower farms, refrigerators	Refrigerators widely used. Flower farms on the increase Chemical use checked by international market
4	Resistant organic pollutants	Agricultural farms	Large mechanized farms use chemicals for weed and pest control.
5	Radiation	Fluorescent tubes, radio stations, mobile and masts	Widespread use of fluorescent tubes and mobiles. Masts have been erected in all parts of the district. Radio stations in Eldoret town
6	Agrochemicals and pesticides	Agricultural farms	Used throughout the districts. Run off into rivers limited due to very gently to flat terrain
7	Laboratory waste	Laboratories in hospitals, schools and private	Mainly burnt or buried or placed in municipal rubbish bins ending in dumping sites
8	Asbestos	Factories	Use limited. Companies like Coca-Cola are phasing it out

4.2 Trade sector

Types of trade conducted in the District

Retailers: These are traders who basically depend on the wholesalers. Their activities are done on a single item basis.

Wholesalers: These are the distributors who basically act as the go between or agents of the producers.

Hawkers: They do not have a specific region to trade from. They do their business while on motion. They equally depend on the wholesalers and partially the retailers.

The main trade goods in the district are cereals and Dairy, besides the normal industrial products that can be got in the supermarkets. The trends and trading patterns vary in the district particularly in horticulture, cereals and livestock (dairy).

Horticulture

- Horticulture – the area around Eldoret is a major producer of flowers, fruits and vegetables. These require a lot of chemicals and pesticides to achieve the right quality.
- Livestock products – Beef, mutton, pork, milk. There is an increasing demand for fresh milk which the traders pack in polythene bags. Fish mongers do not have permanent stalls. They put up fish tables in every available space.
- Challenges of trade liberalization
 - substandard imported products such as batteries, used vehicles and electronics are a big challenge to the environment as concerns their disposal after a very short lifespan.
 - People are increasingly consuming such goods because they are cheap.

4.2.1 Relationship between consumption patterns and the environment

Hawking – careless disposal of rubbish

- Most of the pre-packed food items are packed in polythene bags whose disposal has littered the environment.
- Careless disposal of human waste
- Indiscriminate cutting down of trees without replacement
- Improper use of the sewerage system leading to blockage

- Careless disposal of solid waste including metals
- Wasteful use of water
- Poor farming methods
- Charcoal burning
- Non recycling of used plastics
- Unplanned structures in urban centres which interfere with drainage flow and both human and vehicle traffic.
- Air pollution due to smog from the increase in the number of vehicles and burning of waste products such as tyres and foam
- Flow of used oil, grease from garages and car washing yards into water systems and also contaminating land.

Table 33: Type and impact of trade on Environment

No.	Trade type	Raw materials	Product	No. of People employed	Waste Solid/gaseous	Environmental impacts	Mitigation measures
1.	Hawking	various	Fruits, electronics, confectioneries	About 1000	Fruit peelings, plastics and polythene	Littered environment	Provide waste bins
2.	Retail and wholesale	Various	Electronics, sugar, oil& fats, etc	15000	Polythene and plastic wrapping materials	Littered environment	Should adopt use of biodegradable materials
3.	Caterers (Hotels)	Potatoes, vegetables etc	Such foods as Chips, posho, meat stew	1000	Solid waste	Blocking of drains etc	Provide disposal bins
4.	Motor vehicle repairers	Paints, oil and petroleum	Painting, panel beating, oil changes, etc	1800	Solid and liquid	Land and water pollution	Each garage should have a disposal pit
5.	Woodworks, poles and posts	Trees	Furniture, building poles, electric power and	-	Climatic change, soil erosion, etc	Forest depletion	Replace the trees felled

No.	Trade type	Raw materials	Product	No. of People employed	Waste Solid/gaseous	Environmental impacts	Mitigation measures
			telephones				

Key Environmental Issues Related to Trade

- Air pollution – trade activities contributing to this are the noise pollution for the multitude of cars and heavy commercial vehicles hooting and revving. Smoke and smog arising from the same vehicles which are increasing in numbers by day.
- Unplanned structures – These are found on almost every available open space along the major highways, the main bus park being the major culprit. They temporary in nature and have many different kinds of goods displayed therein.
- Waste disposal and mismanagement – the main culprits here are retail and wholesale outlets especially supermarkets. Their packaging materials mainly polythenes and plastic items litter every corner of the town. These materials being non biodegradable and solid in nature are a big environmental problem.
- Water pollution – main activities here include activities of petrol stations, motor vehicle garages, and horticultural farms. Pesticides, agrochemicals, spilt oils, greases, metal fillings, and other forms find their ways into rivers, water courseways and shallow wells hence polluting them.(see table 10.4)

4.3 Services sector

Roads, Railways and Airports

To facilitate trade and industry infrastructural facilities are needed. The construction of roads, railways and airports has their effect on the environment. Clearing of areas to pave way for the construction of the above facilities interferes with the environment in one way or the other. Equally, when put on use, accidents which result in spillage of oil chemicals and loss of human, animal and plant life are common.

4.3.1 Telephone, Electricity

Electricity and telephone network require poles. These are products from the forests. The high demand for these to upgrade our infrastructure may cause more harm than good if the replacement is not taking place at the same rate.

4.3.2 Air Transport

Airline is a growing industry for both cargo and passenger travel. It facilitates trade in goods and services. The recent plane accidents result into fire mangled wreckages littering the ground and loss of human life.

4.3.3 Buildings

The construction of buildings may start with clearing the ground to create room for construction. This at times may be through felling trees. Poorly constructed or maintained buildings may equally be a danger to the occupants and the surrounding environment. Protruding live electric wires on the walls of buildings may pose danger to the user. Poorly constructed sewerage systems to discharge wastes from the buildings may equally be dangerous to the environment. When the sewerage system blocks and the wastes flow onto the land surface or finds its way to the water sources, it becomes a potential health hazard.

Table 34: Service sector Linkages to environmental Degradation

No.	Services	Linkages(Impact) to environmental degradation	Proposed interventions
1.	Telephone, Electricity	Land lines use wooden poles, extensive use of poles to carry power transmission cables. The two lead to forest depletion. Mobile telephone kiosks popularly known as simu ya jamii have caused congestion even blocking walkways.	Examine the possibility of using concrete posts Replant forests with faster maturing species Regulate the growth of these units
2.	Railways and Roads	Roads – construction of all weather roads use bitumen and ballast. The ease of wear and tear of these roads means more of these raw materials are needed. Railways – though no new lines have been laid, the old lines need replacement of wood slippers leading to forest depletion.	Construct roads using cement blocks which are believed to be more durable. Examine the possibility of using other materials instead of wood slippers
3.	Buildings	Poorly planned structures put up using substandard materials.	All buildings should adhere to the laid down building regulations All building developers should be asked to comply with EIA

Key Environmental Issues and Proposed Interventions

Priority Issues/Challenges	Current Intervention	Proposed Intervention	Responsible Institution	Remarks
Emission of toxic wastes into the	-	Formulate a law and policy setting the	GOK NEMA	

Priority Issues/Challenges	Current Intervention	Proposed Intervention	Responsible Institution	Remarks
environment		standard for all players to comply with- vehicles and industries	Local authorities	
Exhaustion of existing forests	Ban on tree harvesting	Replant forests with faster maturing trees Involve large scale wood consumers in forest management	GOK	Examine the possibility of using concrete posts for telephone and power carrier lines
Contamination of rivers, underground waters and other water causeways	No interventions at all, apart from big industrialists required to put waste water treatment works	Relocate all industrial activities including garages, carwash etc to areas where they can easily be monitored.	NEMA GOK Local authorities	
Unprofessional handling and use of agrochemicals	none	Basic education for all handling agrochemicals	GOK	
Extensive use of non biodegradable materials for packing foods	none	use of biodegradable materials for use in packing Producers of polythene bags should include instructions on the safe disposal methods	GOK NEMA Private sector	
Solid and liquid waste management	Sewerage lines and dumpsites	Expand the existing sewerage lines in tandem with population growth. Encourage the establishment of industries that use such solid wastes as raw materials Put up recycling plants	GOK NEMA Local authorities Private sector	
Substandard buildings,	Building plans supposedly	Re-plan the major urban centres to	GOK NEMA	

Priority Issues/Challenges	Current Intervention	Proposed Intervention	Responsible Institution	Remarks
encroachment on urban open spaces.	approved by the local authorities	allow for easy movement, decongest walkways and have in place an urban master plan.	Local authorities	

4.3.4 Tourism

The District has a lot of potential in tourism resources but most of which are still untapped. The natural and cultural resources in this region are unique and diverse hence the need to control the degree and manner in which they are exploited and to anticipate the effect of the sustainability of tourism by different methods of exploitation in order to contribute to the conservation and management of the environment.

Tourism and the Environment

- Most natural resources such as forests have been depleted by other sectors as human settlements; construction and agriculture have adversely affected tourism.
- There has been a limited impact on our cultures but with the increase in number of tourists in the area there will be various effects.
- Tourism facilities are not up to standard which thus affects the number of tourists visiting the area. The roads are not badly off.

The Tourism office is regional, hence regional data is as shown below.

Table 35: Type of Tourism, Attraction and Potential

No.	Type of Tourism	Attraction	No. of Facilities	Geographical Location	Environmental impacts
1.	Cultural Tourism	Diverse peoples cultures, e.g. Nandis, Keiyos Dances Cultural artefacts	Nandi cultural center and museum	11 km from Eldoret town along Eldoret - Kapsabet Road.	Cultural erosion Promotion of local economic benefits Rise in crime rate Infringement of local privacy Spread of environmental disease e.g. STI
2.	Sport Tourism	Athletics training camps Origin of the			Infrastructural development Promotion of GDP

No	Type of Tourism	Attraction	No. of Facilities	Geographical Location	Environmental impacts
		worlds renowned athletes and also for training			Inward and outward Migration
3.	Biological attractions	Kruger Farm Lt(game ranch with giraffes and heedbucks, Oribi, Serval Cats, Jackal Porcupine, ant bear, birds, e.t.c) Nandi rock Bonjoge National Reserve	Naiberi Camp site Tindinyo falls resort	17Km from Eldoret off Eldoret – Iten Road (Uasin Gishu) Nandi South	Habituation of animals Littering and soil erosion Night game drives and hiking safaris together with associated impacts Off road driving
4.	Geological attractions	Keben Soda Water springs(Urugine water springs surrounded by very beautiful scenery) Chepkitit falls Kormosho water fall		Nandi South, 120 Km off Kapenguria Lodwar road Nandi North 4 Km from Eldoret International Airport Uasin Gishu Eldoret – Webuye Road	Collection of souvenirs Pollution
5.	Agro tourism	Wheat, maize, horticultural farms			

Profile of North Rift Tourism Activities

The North Rift region includes the following districts:-

- Uasin Gishu
- Trans Nzoia
- Keiyo
- Marakwet
- Nandi North
- Nandi South
- West Pokot
- Turkana

Registered Establishments

The following are the registered establishments under the various categories in this region.

Category	NO.
Hotels	77
Restaurants	61
Travel Agents and Tour Operators	8

Tourism Attraction Areas

North Rift region has a lot of areas of tourist potential many of them still unexploited. There is potential here to optimise the promotion of unique forms of tourism like agro tourism, sports tourism and cultural based tourism.

Various areas are highlighted in the table below.

Table 36: Tourist Attraction Areas in the North Rift Region

Attraction Area	Location District	Access
1. Mt Elgon National Park	Trans Nzoia	28 Km. from Kitale town via Endebes
2. Saiwa swamp National Park (has the rare and endangered Sitatunga antelopes)	Trans Nzoia	20 Km from Kitale off Kitale - Kapenguria road
3. Kitale Nature Reserve(Botanical Garden and Game Sanctuary)	Trans Nzoia	7 Km from Kitale off Kitale - Kapenguria road
4. Delta Crescent Wildlife Sanctuary(Game Sanctuary, Lodge and camp site)	Trans Nzoia	7 Km. from Kitale town via Endebes
5. Sirikwa Safaris and Lodge(Lodge, Camping Site, Historical Site and Tour Operator)	Trans Nzoia	30 Km from Kitale off Kitale - Kapenguria road
6. Kitale Museum	Trans Nzoia	Kitale town
7. Treasures of Africa Museum	Trans Nzoia	Kitale town
8. Kruger Farm Ltd.(Game Ranch with Girraffes, Rheedbuck, Oribi, Serval cats,Jackal, porcupine, ant bear, and birds e.t.c)	Uasin Gishu	17 Km from Eldoret off Eldoret – Iten Road
9. Naiberi River Camp Site	Uasin Gishu	25 Km from Eldoret off Eldoret – Eldoret Road
10. Kormosho Water Falls	Uasin Gishu	10 Km from Eldoret off Eldoret – Webuye Road
11. Great Nandi Cultural Centre – upcoming cultural centre along Kaptagat road	Uasin Gishu	11 Km from Eldoret along Eldoret – Kapsabet Road
12. Chepkit falls	Nandi North	4 Km from Eldoret International Airport off Eldoret – Kapsabet Road
13. Tindinyo falls resort (Campsite, Picnic site and Lodge along Yala River)	Nandi North	20 Km from Kapsabet off Kapsabet Chavakali Road

Attraction Area	Location District	Access
14. Nandi Rock and Bonjoge National Reserve	Nandi South	
15. Keben Soda Water Springs(unique water springs surrounded by very beautiful scenery)	Nandi South	10 Km from Lessos
16. Nasolot National Reserve	West Pokot	120 Km from Kapenguria off Kapenguria Lodwar Road
17. Kapenguria Museum	West Pokot	Kapenguria Town
18. Turkwel Gorge and Power Plant	West Pokot	120 Km from Kapenguria off Kapenguria Lodwar Road
19. Kerio Valley Escarpment(Stretching across Keiyo and Marakwet Districts with Various view points)	Keiyo and Marakwet Districts	
20. Cherangani Hills	Marakwet, West Pokot, Trans Nzoia	
21. Rimoi National Reserve	Keiyo	54 Km from Iten off Iten Kabarnet Road
22. Chebloch Gorge	Keiyo and Baringo Boarder	28 Km Kabarnet across Iten Kabarnet Road
23. Tugen Hills(with forest, hills and some agricultural areas)	Baringo Distric	
24. Lake Baringo, ,	Baringo	64 KM from Kabarnet Via Marigat
25. Lake Bogoria	Baringo and Koibatek	60 Km from Kabarnet off Kabarnet Nakuru Road
26. Kampi ya Samaki Snake Park	Baringo	64 KM from Kabarnet Via Marigat
27. Kapsaraman Museum	Baringo	38 KM from Kabarnet Via Kabartonjo
28. Kabarnet Museum	Kabarnet	Kabarnet town
29. Lake Kamnarok	Baringo	50 Km from Kabarnet off Iten Kabarnet Road
30. Lake Turkana	Turkana	120 Km from Kapenguria off Kapenguria Lodwar Road
31. Lake Turkana	Turkana	Across large parts of Turkana District
32. Central Island	Turkana	Within Lake Turkana

There are numerous athletics training camps that are meant to utilise the advantage of high altitude training. Majority of Kenya's leading athletes come from this region and the training camps are owned or associated with some of them. These camps attract international tourists coming to train and some coming to see this land that produces such world renowned athletes.

Agro tourism takes place in the expansive tea plantations of Nandi and in the wheat and maize farms of Uasin Gishu and Trans Nzoia as well as in some flower farms. The cultures of the people of this region are rich, authentic and diverse and this is a major selling point here. Establishment of cultural centres and museums could further harness this potential.

The North Rift offers numerous other topographical features which include hills, rivers, waterfalls and dams. More lodges, camps and picnic sites could be developed in such places. Water sports facilities could also be developed in the existing water bodies. Kerio Valley area is also ideal for paragliding.

Way Forward

- a) As seen before, this area offers resources for development of unique forms of tourism like agro tourism, sports tourism and cultural based tourism. The North Rift has done well in agriculture over the years and its sportsmen have excelled at the international level. The cultures of the people here are rich and their artefacts still well preserved. The realization by the local people that the same activities they have excelled in can attract tourism and earn them more wealth is already serving as an encouragement to them and all players have to continue building on this.
- b) Investors, both local and foreign need to be encouraged to set up better quality accommodation facilities. This should include some of the leading companies investing in chains of hotels and lodges in various other parts of the country to invest here. There will be benefits from their established marketing networks as well as the high standards they have set.
- c) Facilities such as cultural centres and museums need to be set up to optimise utilization of the existing potential. Local authorities need to be involved in this.
- d) The existing resources that have not been exploited need to be harnessed to ensure that they are utilized. This includes water bodies like rivers and dams that can be used for water sports.
- e) The sport of paragliding is of special importance and its development needs to be pursued vigorously. A group of German Paragliders who visited Iten recently indicated that Kerio Valley has one of the most ideal conditions worldwide for this sport.

It is evident that the current situation in this region does present immense opportunity for investment both in exploiting the untapped resources as well as in hospitality services. Implementing the measures mentioned above will be a major breakthrough that will lead to tremendous improvement in visitation by foreign and domestic tourists.

It is evident that the north rift region has a lot of potential most of which is still untapped. It presents an opportunity to achieving diversification of the country's tourism industry with its scenery and other unique forms of tourism like agro tourism, sports

tourism and cultural tourism. What is now needed is an all out effort both by government and private sector stakeholders to optimise the use of existing resources.

4.4 Mining

Uasin Gishu has no known minerals.

4.4.1 Quarrying

The basement rock in Uasin Gishu is of the metamorphic Precambrian type. The land surface is of phonolite weathering products formed insitu.

The phonolites are hard and excavation requires blasting and heavy machinery. The material is normally used for road construction and concrete aggregates. Below the top soil is a layer of advanced weathering product of phonolite called murrum. It is excavated by hand or machinery and used for road construction and other purposes.

Table 37: Table 4-11: Types of rock and method of extraction

Type of Quarry	Method of Quarrying	Ecosystem	Geographical location/Name of Quarry	Size of Quarry	Quantity extracted	Regulatory agency	Environmental Impacts
Stone	Manual	Forest	Nabkoi	-	Currently not licenced, thus not operational	Forest Dept.	Devegetation Land degradation
Aggregate	Manual	Farmlands	Scattered	Small scale	-	Not regulated	No significant destruction, rocks normally on ground surface; improves agricultural land
	Machinery	Farmlands	Sirikwa	-	-	Local authority	Landscape destruction, land degradation, dust, vibrations

Type of Quarry	Method of Quarrying	Ecosystem	Geographical location/Name of Quarry	Size of Quarry	Quantity extracted	Regulatory agency	Environmental Impacts
Murrum	Manual	Farmlands and roadsides	Scattered	Small scale	-	Not regulated	Land degradation

Table 38: Table 4-12: Unrehabilitated Quarries

Type of Quarry	Status	Name/Size	Mitigation measures
Stone	Operation temporarily suspended		Revegetation
Aggregate	Operations stopped	Gituro (private) Approx. 2 acres	Order issued for rehabilitation
	Operations temporarily suspended	Airport (private) Approx. ½ acres	Currently used for livestock watering Fenced
	Non-operational. Pose danger to humans and livestock	Kamukunji (ownership unknown) approx. 1 acre	Partially fenced; needs urgent rehabilitation.
Murram	Operations on and off as need arises	Small scale	There is need to monitor and advise refilling and revegetation

Quarries are not under any one lead agency. Mines and Geology Department comes in when there is use of explosives to license and supervise their use. Local authority licenses trade. Therefore it is very difficult to obtain specific data. In addition, there is no quarrying organization or association.

Key Environmental Issues

Types of pollutants and wastes in quarries include noise and vibrations where blasting is applied, and dust. Quarrying involves excavation of rocks and murram. This results in devegetation and pit formation. There is therefore loss of aesthetic beauty of the landscape and creation of hazard sites.

4.4.2 Regulatory and Institutional Arrangement

Noise, vibration and dust pollution are likely to decrease because of application of environmental tools specifically EIA and EA. Normally, all products of quarrying and

processing are utilized. The top layer soil is used for refilling excavated sites while the aggregates are used for their intended purpose. Accidental spills and uncollectable aggregates however may be treated as waste. The resulting dust from aggregates is used for building block making.

Impacts of pollutants and wastes include respiratory and eye problems, injury and property loss, due to flying rocks during blasting, cracking structures due to vibrations, death or injury of humans and livestock as a result of accidental falling into quarry pits.

Mitigation measures include:

- i. Environmental Auditing and application of EMP
- ii. Fencing of quarry areas
- iii. Siting quarries in low population areas

Management challenges include:

- i. Lack of documentation
- ii. Lack of lead agency directly in charge of quarrying
- iii. Lack of legislation to govern quarrying
- iv. Small scale quarry operators are not organized
- v. Lack of environmental inspectors

Key Environmental Issues and Proposed Interventions

Priority Issues/Challenges	Current Intervention	Proposed intervention	Responsible Institution	Remarks
Lack of lead agency directly in charge of quarrying	Mines and Geology Dept. regulate use of explosives Local authority regulate trade	Place quarrying under Mines and Geology Dept.	NEMA to lobby Parliament to effect	Needed urgently
Lack of legislation	As above Use of EMCA	Formulate law and include in Mines and Geology NEMA to provide guidelines and standards	As above	“
Lack of environmental inspectors	DEOs acting	Gazette DEOs as inspectors among others	NEMA	“
Lack of documentation	Site analysis	Suggested lead agency to document	Proposed Mines and Geology Dept.	
Lack of	-	Educate	As above	Once the

Priority Issues/Challenges	Current Intervention	Proposed intervention	Responsible Institution	Remarks
organization among small scale operators		operators on need for organization	Local authority	system and structures are in place.

4.4.3 Sand harvesting

Sand harvesting in the district is not a significant activity. There are only very few isolated cases of the activity at very small scale. The only source of sand are rivers Kipkarren and Moiben. And manual scooping is applied. The activity is not regulated.

The main environmental impacts are riverbank erosion. The activity should be discouraged since sand deposits are minimal and activity not economically sustainable.

The Ministry of Water jointly with Wareng County Council can control the activity.

CHAPTER FIVE

5.0 ENVIRONMENTAL HAZARDS AND DISASTERS

Most environmental disasters are climate/weather and tectonic movements related. Environmental disasters have a tendency to retard and erode gains made in building meaningful livelihood and economic development

Hazard: A potentially damaging physical event, human activity or phenomenon with a potential to cause loss of life or injury, property damage, social and economic disruption of life, environmental degradation among other effects. And few cases of Environmental disasters have been reported in the district.

Disaster: A disaster can be defined as a serious disruption of the functioning of the society causing widespread human, material or environmental damage and losses which exceed the ability of the affected community to cope using their own resources

5.1 Extent and trends of environmental hazards and disasters

This section describes environmental hazards and disasters, their extent and trend including geological, climatic, biological, and technological hazards as well as existing mitigation measures, physical, indigenous knowledge.

5.1.1 Environmental Hazards and Disasters

Like all other districts, Uasin Gishu is vulnerable to disasters and hazards that pose challenges to achieving the development objectives including poverty alleviation. The common types of environmental hazards and disasters in the District include **floods, fires and (road) accidents**. The results of the above have been destruction of the environment particularly along the riverbanks as well as property and loss of life.

5.1.2 Extent and trends of environmental hazards and disasters

Floods:

A total of 67 floods were recorded between the years 1997-2001. Major causes of floods were overflowing riverbanks and poor drainage, especially at Uhuru Estate.

Fires:

Between the years 1997-2001, the district experienced a total of 428 fire episodes. The Eldoret Municipal Council (EMC) Fire Brigade attended to 152 calls between 2001 and 2003 which left private and government entities with a loss of about Kshs. 8.4 million. Major causes of fires reported in the district were drought and electrical faults.

Accidents:

A total of 1,107 accidents occurred out of which 268 were fatal, 494 were serious and 345 caused slight injuries to the victims during the 1997-2001 period. Major causes of accidents were man-made i.e. drivers, pedal cyclists, pedestrians and passengers. When combined, they accounted for over 80% of the accidents that occurred during that period.

Mitigation measures

In order to reduce the frequency and extent of damage of the above hazards and disasters, a number of measures have been put in place. The traffic department has intensified road safety public awareness campaign through public lectures to all learning institutions and through public barazas as well as through radio broadcasts to sensitize all road users on road safety. In addition, the Ministry of Roads and Public Works and EMC have combined efforts to erect bumps where required and painting road edges. Further, road signs have been restored to warn and regulate traffic.

Table 39: Status of early warning and preparedness

Sector	Type of disaster	Human resource	Technical (equipment)	Financial	Coordinating mechanism (logistics)	Lead agency
Forest	Fires	Staff	Ambulance Fire engines, First Aid Kits		Disaster Management Committee	Forest dept and EMC
Transport	Accidents	Police and community	“		“	Police, Public Works

Sector	Type of disaster	Human resource	Technical (equipment)	Financial	Coordinating mechanism (logistics)	Lead agency
Climate and weather	Floods		“		“	Meteorological Department

Key environmental issues and proposed interventions

Prioritized issue	Current intervention	Proposed intervention (2006-2010)	Responsible institution
Flooding	Drains and culverts	Proper planning and implementation of plans	Physical planning, public works, Local authority
Fires	Fire engines, Hydrants, extinguishers	Sensitisation and Training	Forest, Public Works, local authorities, Occupational Health and Safety
Accidents	Bumps, zebra crossing, speed governors	Law enforcements and public education	Min. of Transport and Communication, Public Works

5.1.3. Traditional Coping Mechanisms

There are some traditional coping mechanisms that even though not so popular today used to work for the benefit of the community and the environment. Some of these include:

- De-stocking in anticipation of an imminent drought
- No settlement on areas perceived to be prone to landslides. These areas were out of bound and were left out as conservation areas.
- Food preservation for consumption during dry spells

5.1.4 District Environmental Response Mechanisms

There exists a District Disaster Management Committee whose main responsibility is to respond to disaster occurrences and organise for relief to ease the impacts of disaster on the lives of the people.

This committee should be empowered to have the necessary capacity to develop and

implement systems and mechanism not only to react to disaster situation but also to proactively act on the causative factors of the most occurring disaster situation.

5.1.5 Status of Early Warning and Preparedness

Capacities to mitigate and recover from disasters are often constrained by lack of early warning systems and preparedness, keeping in minds the social dimensions and livelihood options that hamper the building of resilience from external shocks. Table 41 shows the capacities for disaster preparedness and response in the district.

Table 40: Sector Capacities for Disaster Preparedness and Response

Sector	Type of Disaster	Human Resource	Lead agency
Agriculture	Drought	Extension workers	
Health	Epidemics	Social workers, doctors and public health officers	Public health
Security	Conflicts	Security agencies	Provincial Administration
Wildlife	Drought / Conflict / Fire	Warders	KWS
Forestry	Fire	Forest guards	Forest Dept
Water	Drought	Hydrologists	WRMA

Source: District Environment Office 2007 - UasinGishu District

Key Environmental Issues

- Lack of Disaster preparedness
- Lack of appropriate early warning systems and technologies
- Inadequate capacity and resources to handle disasters

Proposed Interventions

- Adoption of environmental early warning systems and preparedness strategy
- Development of response plans
- Establishment of food reserves
- Plan and stock up and be ready for any disaster

- Develop appropriate warning systems for each disaster
- Ad hoc arrangements and response
- Allocate more resource for disaster response
- Acquire skill in disaster management

CHAPTER SIX

6.0 ENVIRONMENTAL EDUCATION AND TECHNOLOGY

As Kenya aspires to achieve sustainable development, there is need to educate the public on the importance to participate in environmental conservation and application of appropriate technology while addressing their socio-economic development concerns.

6.1 Status of Environmental Education

In the endeavour to participate in conservation efforts, there are a number of initiatives started by various groups to promote environmental educational programmes in the district. An environmental group called Itinerant Group for Environmental Amelioration (IGEA) has been involved with about 10 schools in Ntonyiri and Igembe in nursery establishment and tree planting programmes

Various schools, both secondary and primary have initiated clubs like Wildlife Clubs of Kenya, 4K clubs and Environmental clubs to promote conservation of the environment in and around their schools. There are over 50 schools with such initiatives and the District Environment Officer is co-ordinating their activities.

Moi University which is based in the district offers a full course in Environmental studies at masters' level, as well as other aspects of the environment namely forestry, wildlife management, agriculture, environmental health.

Table 42 documents the environmental programmes and challenges in the district

Table 41: Table 6-1 Status of Environmental Programmes in Schools

No.	No. of Schools			Types of Environmental Programmes	Remarks
	Primary	Secondary	Tertiary		
1.	Approx. 20			Young farmers club, wildlife club	Most not active for lack of leadership and emphasis
		Approx. 40		Young farmers club, Wildlife club, environmental club	-ditto-
			1 (Moi University)	Forest, wildlife, environmental club	Student initiative and voluntary

Source: District Education Office, Eldoret.

Key Environmental issues

- Lack of awareness creation materials (resource / documentation centre)
- Poverty and ignorance and lack of awareness
- Poor infrastructure.

Proposed Interventions

- Develop materials for awareness creation
- Collect and gather materials that are appropriate to priority environmental issues
- Share and disseminate pertinent information among the stakeholders
- Improve infrastructure.

6.2 Public awareness and participation

When information on the environment is made available to the public it enhances internalization of values that support sustainable environmental management.

Key Players

Some of the key players in environmental awareness and public participation in the district include:

- Community self help groups
- Provincial administration – organise public meetings
- Forest department – collaboration with farmers and stakeholders
- Ministry of Agriculture – provision of extension services
- NEMA – environmental awareness and sensitisation

Table 42: Status of Environmental Awareness and Participation in the District

Programs	Key Players	Sector	Environmental Benefits	Opportunities	Challenges	Interventions
LVEM P	Forest, NEMA, CBOs, community	MENR	Afforestation, wetland conservation, water source protection	Increased tree cover, provision of clean water, Wise use of wetlands	Financial constraints	Training of trainers
NALE P	Agric. Community	Agric.	Soil and Water conservation, Agroforestry	Better farming activities, hunger/poverty eradication	weather	Irrigation

Programs	Key Players	Sector	Environmental Benefits	Opportunities	Challenges	Interventions
Road 2000	Public works	Public Works	Road and roadside maintenance, Flood control	All year round motorable roads, fewer accidents, less flooding	-	-
Church based	Community	Church	Afforestation, water source protection/harvesting	Wide coverage	Limited skilled workers	Use focal points
Mass media	SAYAR E	Information	Information	Wide coverage	Follow up	-

Key Environmental Issues and Proposed interventions

No.	Issue	Proposed Intervention in the Plan Period 2006 - 2010	Responsible Institution	Remarks
1.	Slow implementation because of initial cost implication	Reduce tax Enforce EMCA	Policy makers, NEMA and Lead Agencies	
2.	Inadequate information on better technologies	Create awareness Sensitisation More information centers	NEMA Line ministries Learning institutions (Moi University, Eldoret Polytechnic, Rift Valley Institute of Technology)	ASK shows good for exhibitions but cost becoming prohibitive. Encourage science subjects in schools
3.	Laxity in law enforcement	Motivation; facilitation and adequate personnel	GOK	Commitment and self motivation very important
4.	Use of electricity and other energy forms is expensive hence preference for wood fuel	Reduce cost of electricity and other forms of energy	Policy makers KPLC KENGEN	Use of locally available sources should be encouraged e.g. tidal waves, biogas
5.	Low selling rates – products more expensive therefore less affordable	Reduce taxation	Policy makers, Manufactures	Importation an alternative

No.	Issue	Proposed Intervention in the Plan Period 2006 - 2010	Responsible Institution	Remarks
6.	Resistance to change	Education, awareness campaigns, law enforcement	GOK, CBOs, NGOs, schools/Institutional curriculum	Training of youth key to change
7.	Lack of environmental managers in various establishment	Make it law requirement	Responsible establishment Licensing authorities NEMA	

6.2.1 Challenges in Creating Environmental Awareness

- Lack of awareness creation materials (resource / documentation centre)
- Incomplete adjudication process and land disputes creating conflict zones
- Poverty and high levels of illiteracy
- Community apathy
- Transport and accessibility
- Politicisation of some key environmental resources

6.3 Technologies

Technologies can contribute to economic development and environmental conservation when used appropriately. The level of application of modern technology in the management of the environment is limited, and includes construction of gabions and other modern structures. People still largely depend on indigenous technologies, innovations and practices which include that are diverse and include soil and water conservation structures like trenches, benches and lining up crop residue, rotational cropping, preservation technologies and others.

Key Environmental Issues

- Lack of awareness creation materials (resource / documentation centre)
- Poverty and high levels of illiteracy
- Community apathy
- Poor infrastructure
- Low adoption of appropriate technology

Proposed Interventions

- Development of relevant materials
- Development of a resource centre
- Poverty alleviation programmes and education
- Community sensitisation and awareness
- Reach out to people in accessible area
- Infrastructure rehabilitation
- Community training and education
- Enhance technology transfer through demonstration
- Provision of extension services

6.5 Environmental Information Systems

The broad challenge in harnessing environmental information and communication technology include inadequate resources and capacity for information collection, analysis, storage and dissemination; inadequate awareness among environmental managers and the public; and lack of knowledge sharing networks at grass root level.

6.5.1 Types and Sources of Environmental Information

Most of the information available in the district is scattered among the different organisations and institutions and in different forms and types and is available mostly as:

- Research and surveys reports
- Departmental progress reports
- Population Census data and household surveys results
- Maps and drawings
- Books

Some information is not documented at all, especially that which relates to indigenous conservation knowledge and natural resources utilisation among others.

Institutions where the data is available

- GOK departments on sector specific information and data
- Institutions like schools and hospitals
- Among the civil society organisations and community groups

All documented data and information is freely accessible to the public, the only hindrance being the level of literacy among the population. Access to digitalised

information is limited.

Table 43: Information and data types in the district

Sector	Type of Information	Form of Information	Institutions	Access conditions/ policy	Users	System Of updating
Agriculture	Crop development and husbandry Agro-chemicals Agro industries Soil and water conservation Marketing	Reports Posters Maps Leaflets	Dept of Agriculture	Free	CBO Farmers Extension workers Staff	Annual
Land	Land adjudication Land registration process Land sizes Parcel numbers Conservation areas	Maps Reports Plans and drawings	Land Adjudication	Consultation	Farmers Planners Surveyors Staff Business people	Periodical
Health	Prevalence of diseases	Hospital reports	Hospitals Health centres Dispensaries and clinics	Restricted	Health workers	Manual and periodical
Forestry	Forest types Gazetted forest Non – gazetted forests Plantations Exotic species Biodiversity Catchment	Maps Reports	Forest Dept	Free and accessible	Community Staff Other departments Industries CBOs NGOs	Periodical

Sector	Type of Information	Form of Information	Institutions	Access conditions/ policy	Users	System Of updating
	s					
Industry	Types Processing Raw materials Products Waste and by-products	Reports Diagrams	Industries	Free	Staff Interested persons Government officials Farmers	
Wildlife	Conservation areas Wildlife dispersal areas Cases of conflicts Animal numbers, status, behaviour	Maps, Reports,	KWS	Free	Staff Tourists Conservationists Planners Environmentalists Community	Periodical
Quarrying	Quarry sites Rehabilitated quarries Abandoned quarries Materials quarried		NEMA	Free	Local Authorities Contractors Quarry owners	
Fisheries	Types of fish Fishing areas Marketing of fish Rivers with fish Fish ponds Fish farmers	Maps Magazines reports	Fisheries Dept.	Free	Fish farmers Staff	
Water	Rivers Water accessibility Boreholes Drainage patterns Water	Maps Reports Diagrams	Water Dept	Free	Water users association Water projects Community Staff Other dept Industries Farmers	

Sector	Type of Information	Form of Information	Institutions	Access conditions/ policy	Users	System Of updating
	availability Irrigation schemes Water uses Abstraction levels					
Climate and weather	Rainfall and temp	Tables Reports		Free	Staff Farmers Community	Regular

Source: District Respective Departments 2007 - UasinGishu District

6.5.2 Status of Environmental Information Management Systems

Newsletters, magazines, books, posters, reports, electronic media, photographs, maps

Institutions where data is available

Universities- Moi University

NGOs- Etang Kenya, Catholic Dioceses of Eldoret, SMU Kenya, World Vision, Anglican Church of Kenya,

Regional Authorities – Kerio Valley Development Authority, Eldoret airport

Government – Line ministries, local authorities, LVEMP, NEMA, Moi Teaching and Referral Hospital,

Information Centres – Kenya National Library, DIDC

Format of Data and accessibility by the Community

The communities may get photocopies of required portions, or have own questionnaires which they fill. They may also just conduct oral interviews and take short notes. Data is normally free except in cases where copies have to be made. The Airport Authority charges a fee to avail data.

Table 44: Types of Information by different sectors

Sector	Types of Inf.	Form	Institution	Access conditions	Users	Updating System
Learning	Assortment	Electronic, books, reports, journals	Moi University, Moi Teaching and Referral Hospital		Students, public	

Sector	Types of Inf.	Form	Institution	Access conditions	Users	Updating System
Government	Assortment	Books, Reports, Maps	Line ministries	Free	Public, students	Policies, regulations
NGOs/CBOs	Forestry, water, sanitation, energy, agricultural	Reports, Oral, electronic, maps, magazines	SNV Kenya, Etang Kenya, World Vision, Catholic /ACK diocese, CBOs	Free	Students, public	e-machines, new publications
Authorities	Weather, water, forest, agriculture	Electronic, maps	Kenya Airports Authority, Eldoret; KVDA	Fee Free	Students, public Public	e-media, daily release Research
Information Centres	Assorted	Maps, books, journals, magazines e.t.c	Kenya National Library, District Information Centre	Free		Students, Public, government ministries

15.2 Status of Environmental Information Management Systems

Information sharing/ communication mechanism between institutions / lead agencies, committees, task forces

- Correspondences
- Publications
- Meetings
- Workshops/seminars
- National Celebrations – WED, WWD, Tourism Day, Tree planting day, e.t.c.

Adequacy of Institutional skills in information management

- inadequate or lacking

No. of documentation centres – 2; DIDC, NEMA

Libraries – Moi University (in every campus)

- Kenya National Library

Circulating Newspapers

Nation

Standard

People

Times

Magazines

NEMA

FAN

Local Publications

Constraints and Challenges in environmental Information /do the collection and dissemination coordination networking and collaboration among various institutions

- Inadequate materials
- Limited information centres
- Inadequate manpower
- Limited funding

Key Environmental Issues

- The high level of illiteracy
- Limited skills in environmental information management
- Inadequate ICT infrastructure
- Low level of adoption of IT
- Lack of central information dissemination centre

Proposed interventions

- Enhance training in ICT
- Construct and equip the DIDC
- Facilitate access to internet services for schools, hospitals, institutions and government departments
- Create an environmental information database
 - Increase funding to cater for environmental information material production, dissemination and use of mass media(local channels)
 - Every line ministry to have an accessible information centre
 - Use of e-media

6.6 Indigenous knowledge

Kenya has over 42 different ethnic communities with a very rich indigenous knowledge (IK) base unique to each community. This cultural diversity offers potential information that can be exploited to contribute positively to national development and environmental sustainability. Information on IK has not been well documented and properly packaged

to allow effective dissemination, hence contributing to the massive loss of IK from one generation to the next. The table 44 below indicates the types of IK, key players and challenges.

Proposed interventions

Harnessing IK requires a lot of research and thereafter documentation to obtain what is available from the dying generations. Culture in Uasin Gishu is highly diluted and therefore information is limited.

Commercialisation of IK can also be encouraged so that knowledge is not only limited to family lines.

Priority Issues and Interventions

No.	Issue	Proposed intervention in plan period 2006 - 2010	Responsible institution	Remarks
1.	Inadequate materials	<ul style="list-style-type: none"> • Increase funding for material production dissemination and use of mass media • Encourage participation by other sectors – NGOs, CBOs etc 	<ul style="list-style-type: none"> • GOK, • Relevant line ministries 	
2.	Limited information centres	<ul style="list-style-type: none"> • Every line ministry to have accessible information centre 	<ul style="list-style-type: none"> • GOK, • Relevant line ministries 	
3.	Inadequate manpower	<ul style="list-style-type: none"> • Increase staff in relevant areas • Encourage use of electronic media 	<ul style="list-style-type: none"> • Policy makers 	A well equipped office can be managed by fewer persons
4.	Limited funding	<ul style="list-style-type: none"> • Increase funding 	<ul style="list-style-type: none"> • GOK 	
5.	Illiteracy	<ul style="list-style-type: none"> • Make education affordable 	<ul style="list-style-type: none"> • GOK 	

No.	Issue	Proposed intervention in plan period 2006 - 2010	Responsible institution	Remarks
		<ul style="list-style-type: none"> Involvement of NGOs and CBOs in capacity building 	<ul style="list-style-type: none"> Learning Institutions NGOs, CBOs 	

6.6.1 Constraints/challenges in the utilization, documentation and dissemination of indigenous knowledge (IK)

Constraints and challenges in Documentation, dissemination and utilization of Indigenous Knowledge

- Non-propagation of knowledge, not regarded important any more.
- Non documentation
- Dilution of culture
- Formal education that disregards culture
- Abandonment of women initiation (and hospital services for boys) hence no forums for teaching traditions.
- Conservative nature of those in custody of IK
- Shift from traditional to modern religion (Christianity) that does not accommodate traditions.

NB: The IK was passed on (traditionally) through music, oral narratives, artefacts and teachings during initiation ceremonies.

- Most of the IK is not documented
- There exists a gap between the custodians of IK and the elite who have the skills and the capacity to collect and document this data and information
- The general altitude of looking down upon IK as inferior by the elite in society
- Some IK has been overtaken time and therefore not practical
- Some IK is not scientific in nature (belief – based) and therefore cannot be verified and authenticated and therefore not applicable across the board or replicated elsewhere.
- Lack of central information dissemination centre
- Limited skills in environmental information management
- Lack of IT equipment like computers and internet connectivity

- Low level of adoption of IT
- The high level of illiteracy

Proposed interventions

- Construct and equip the DIDC
- Enhance training and create opportunities for people to gain IT skills
- Facilitate access to internet services for schools, hospitals, institutions and government departments
- Emphasize on the importance of generating, sharing and disseminating relevant information
- Offer training and education opportunities
 - Inter-sectoral sharing of information
 - Enhance training and create opportunities for people to gain IT skills
 - Facilitate access to internet services for schools, hospitals, institutions and government departments
 - Emphasize on the importance of generating, sharing and disseminating relevant information
 - Offer training and education opportunities

CHAPTER SEVEN

7.0: ENVIRONMENTAL GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS

7.1 Overview

There are many institutions involved in the management of the environment in the district. They range from government departments, Non-governmental organizations, private sector, associations community based organization and others. With that range of institutions there is bound to be operational conflicts and duplication of roles and responsibilities. The problem is compounded by poor co-ordination, inappropriate and incoherent legislation, lack of adequate institutional frameworks for dealing with governance issues and a lack of understanding of the importance of these ecosystems for human health, well-being and prosperity¹.

Promotion of awareness among the public and policy-makers of the importance of proper management of resources and the integration of environmental issues in the development agenda remains a key priority. Other important priorities include promoting legislation to take up and implement relevant multilateral environmental agreements, harmonizing legal frameworks that address these issues, developing appropriate guidelines, standards and procedures for strategic environmental assessments (SEA) and environmental impact assessments (EIA), developing model legislation for sectors such as local councils, tourism, agriculture, and engaging with relevant organizations to promote sustainable business practices.

7.2 EMCA structures for environmental management

Environmental governance in Kenya involves major players who are coordinated by National Environment Management Authority. There are also sectors of the government who have aspects of environmental management in their programmes and are referred to as lead agencies in the EMCA. Environmental Impact Assessment and Environmental Audit are tools used for planning for upcoming and existing projects respectively

Some of the Lead Agencies in the district

- Ministry of Water and Irrigation

¹*This upholds the Principle of Sustainable development; the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

- The Kenya Forest Service
- Water Resources Management Authority and related Companies and Boards
- Ministry of Works
- Ministry of Housing
- Ministry of Labour and Human Development
- Mines and Geology Department
- Ministry of Education, Science and Technology Development
- Ministry of Medical Services
- Ministry of Public Health and Sanitation
- Ministry of Energy
- Ministry of Agriculture
- Ministry of Local Government
- Kenya Wildlife Services
- Ministry of Livestock Development
- Ministry of Fisheries development

EMCA Committees

- Public Complaints Committee
- National Environment Tribunal
- District and Provincial Environment Committees

7.3. Status of Environmental Governance & Institutional Arrangements

Key issues on governance, legal framework and institutional arrangements and policies are: inadequate capacity to interpret and enforce environmental legislations; conflict of environmental legislations and institutional mandates; undefined pre-existing ownership rights and utilization of natural resources; use of incentives to strengthen compliance for environmental management; introduction and acceptance to pay for ecosystem services and goods; over reliance on elaborate and lengthy court systems and formal institution in deliberating environmental cases. The government departments that collaborate with NEMA (District Environment Office) are Forest, Agriculture, Fisheries, Livestock, Health, Education, Development Office, Water Resources and Management Authority, Local Authorities as indicated in the table this also includes International organizations NGOs and CBOs.

Active Environmental NGOs / CBOs / Private Sector Organization

There is no fully fledged environmental NGO in the district, but there are a number

of active Community Self Help Groups mainly dealing with environmental conservation through efforts to establish tree nurseries and planting trees. A few are involved in mobilising people to undertake environmental conservation through public education and community participation.

The tables 44 and 45 below indicate the policies and legislations that impact on environment in the district.

Table 45: Policies that Impact on Environment

Title of policy	Year of formulation	Aspects of environment addressed by policy	Implementing agency (ies)	Coordinating mechanisms	Challenges in enforcement	Areas on overlaps & conflicts with EMCA
Forest policy	2005	Tree planting, poverty reduction, soil, water & biodiversity conservation, conservation of catchment areas, forest research, training	Forest Dept	Participatory community forest protection, participatory tree planting, reporting forest pest & diseases to KEFRI, research and dissemination of findings by KEFRI,	- Inadequate funds. -Poor coordination-political interferences-inadequate law enforcement	<i>Overlaps</i> - Research -Training -Public participation
Diagnosis, treatment & prevention of malaria	2003	Prevention/control of vectors	Ministry of Health	Seasonal calendar Data compiled at Medical Dept	- Inadequate funds	

Source; District Forest Office, 2006 & District Public Health Office,

Table 46: Legislation that Impact on Human Health & Environmental Quality

Title of legislation	Year of enactment	Aspects of environment addressed by Act	Implementing Agency (ies)	Coordinating mechanisms	Areas on overlaps & conflicts with EMCA
Forest Act	2005	-Management of all state forests -Management of all provisional forests in collaboration with the owners -Protection of forests -Promotion of forestry education and training -Community participation -Prohibited activities in the forest -Presidential protection of trees	Forest dept,	Formation of PFM Formation of user groups Education through barazas	
Water Act	2002	-Management and conservation water resources Protection of water catchments	Water Resources Management Authority	Formation of water users associations and river user associations	
Public Health Act		-Sanitation and hygiene	Public Health Dept		
Fisheries Act	1989	-Pollution prevention zones -Ecological zones where fishing is prohibited	Fisheries Dept		
Agriculture Act		Soil conservation River bank protection	Agriculture Dept		
Pest Control Product Act	1984	Safe use of chemicals Disposal of containers & obsolete chemicals Quality control/persistence	PCPB		
The Local Government Act	1978 and revised in 1998	-Control factories/industries/w hich by smoke, chemical fumes, gases, noise, vibration to neighbours	Local Authority		

Title of legislation	Year of enactment	Aspects of environment addressed by Act	Implementing Agency (ies)	Coordinating mechanisms	Areas on overlaps & conflicts with EMCA
		-Control planning of specific areas			

Source, District Forest, Agriculture, Public Health, Fisheries & Water Offices, 2006

Environmental Impact Assessment (EIA) and Environmental Audit (EA)

These are the regulatory tools applied in the districts for activities listed in the first schedule of EMCA. . Other facilities such as the agro based processing industry; filling stations also undertake annual EA to ensure compliance. Due to the complicated nature of Land use activities as well as sensitivity of wetland management, the District Environment Committee through the District Environment Officer keeps itself informed of the on going activities.

There are various mechanisms in place in the district that ensure that the environment is conserved.

EMCA 1999 provided for the establishment of the District Environmental Committees. The DEC is already constituted and gazette. The Local Authority (Town Council) has an Environment Division to ensure that the environment's integrity is maintained. The level of domestication of MEAs is very low. There is an urgent need for the public to be informed on the contents of these MEAs.

Key Environmental Issues

- Overlaps in enforcement
- Inadequate research on local Environmental issues
- Inadequate capacity for enforcement
- Inadequate public participation
- Lack of established environmental standards
- Lack of mechanisms to establish and measure the extent of environmental damage
- Conflicting legislation
- Weak institutional linkages
- Low level of domestication and implementation of MEAs

Proposed Interventions

- Harmonization of regulations
- Enhanced research on environmental issues
- Enforcement of EMCA and other relevant regulations and guidelines
- Enhance public participation through Barazas and field days
- Domesticate and create awareness on MEAs locally
- Increase co-operation and strengthen institutional linkages
- Enforcement of EMCA (1999) regulations

CHAPTER EIGHT

8.0 IMPLEMENTATION STRATEGY

Environmental issues are cross cutting and their incorporation in development plans is important if sustainable development is to be realized.

Implementation of DEAP will very much depend on the District Development Plans and the National Policies.

8.1 Stakeholders Involvement

Preparation of the DEAP involved consultations with the Lead agencies, NGOs, private sector. The stakeholders were identified based on their mandate and the role played in society. Members of the DDC were key stakeholders in this exercise. The diversity of DEC is a strength that was realized. However, localised interest or biased opinions are weaknesses that cannot be overlooked. Limited resources, limited data collection mainly to secondary data. In most cases, it was not possible to get first hand information. In addition, compiling the data was limited to limited workforce, there being no resources for meetings. The report is therefore not exhaustive.

Stakeholder sharing fora are very resourceful. These include meetings, seminars, and workshops. One such forum introduced within Eldoret Municipality through the district Environment office and SNV Kenya has been very useful. More such avenues need to be created for a wider coverage.

Key ways of integrating implementation of DEAP in stakeholders' policies, plans, programmes and projects include use of environmental tools especially EIAs and EAs. The use of these tools is already bearing fruit.

District Development Plans should be formulated in such a way that environmental issues take centre stage in every sector followed by the implementation of the same.

There is need to review the existing legislation to ensure harmony with the EMCA and by extension DEAP.

Monitoring and Evaluation (M&E)

DEC members will be involved in monitoring and evaluation. It will be a continuous exercise and discussions will be undertaken at the quarterly DEC meetings. Field visits will be very necessary to complete the exercise. There is therefore need for sufficient funds to be set aside for M&E.

Table 47: Implementation Matrix for Uasin Gishu/Wareng District

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Wetlands	To reduce Degradation of wetlands	<ul style="list-style-type: none"> • Sustainably utilised Wetlands • Gazetted management plans for wetlands 	<ul style="list-style-type: none"> • Regulate the usage of wetlands resources • Educate communities on the importance of conserving wetlands • Draw management plans for wetlands • Map and protect wetlands and other fish spawning areas 	WRMA, Min. Agriculture Min of Lands DEC NEMA	1500	1500	1500	1500	1500	

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Livestock & Grazing	To reduce land degradation To reduce Overstocking To increase livestock Productivity		<ul style="list-style-type: none"> • Train farmers to formulate feeds • Encourage investors to establish a hatchery locally. • Improved pasture/seed stock breeds • Improved livestock breeds • Hold livestock marketing stakeholders meeting • Streamline livestock marketing • Activate all sale yard committees • Controlled / deferred grazing • Support establishment of grazing committees • Enact policy on proper livestock stocking rates • Support to livestock off take programmes Reduce the stocking rate • Undertake research on tsetse fly control Control tsetse through suppression, spraying and traps • Control animal diseases • Train the communities on tsetse fly control • Train farmers on good animal husbandry 	Min. of Livestock DLPO SCC MTC ALRMPII KVDA DLMC R.P.K	3000	3000	3000	3000	3000	“

					Estimated costs '000s and time					
Priority Issue	Objectives	Output	Activities	Responsible institution	09/10	10/11	11/12	12/13	2013	Remarks
			<ul style="list-style-type: none"> • Plant fodder crops/trees • Construct cattle drinking water points • Make hay for use during the dry season 							

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Air pollution	To reduce air pollution	•	<ul style="list-style-type: none"> Control burning garbage Promote recycling of waste Apply and enforce Public Health and Sanitation Act on disposal of dead animals Designate an area for dumpsite in urban areas 	Min. of Public Health and Sanitation, Local Authorities Local Authorities Min. of Public Health and Sanitation, Local Authorities DEC	1500	1500	1500	1500	1500	“”

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks	
					09/10	10/11	11/12	12/13	2013		
Energy	<p>To reduce Overdependence on wood fuel</p> <p>To reduce Shortage of wood fuel</p> <p>To increase supply of Energy</p>		<ul style="list-style-type: none"> Enhancement of Rural electrification Promote planting of quick maturing trees Introduction of solar technology Promote use of energy saving devices Promote use of alternative sources of energy eg biogas, solar Energy conservation awareness Promote Agroforestry Establishment of On-farm woodlots 	Min. of Energy KFS DEC, Development Officers DEC							
Environmental Education & Awareness	<p>To increase levels of awareness on environmental education</p> <p>To integrate Indigenous knowledge in</p>		<ul style="list-style-type: none"> Enhance technology transfer through demonstrations Prepare and Disseminate relevant environmental information Promote public participation in 	NEMA Min of Education Local Authorities OOP Social	2000	2000	2000	2000	2000	“”	

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
	management of Environment		<p>environmental plans, programmes and activities</p> <ul style="list-style-type: none"> • Sensitize communities/opinion leads to abandon cultural beliefs that inhibit environmental conservation • Integrate environmental issues in Schools & Adult/Public Institutions and literacy Centres • Increased awareness on environmental laws through <i>Barazas</i>, seminars, workshops <ul style="list-style-type: none"> • Construct and equip the DIDC • Enhance training and create opportunities for people to gain IT skills • Facilitate access to internet services 							

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
			<p>for schools, hospitals, institutions and government departments</p> <ul style="list-style-type: none"> • Emphasize on the importance of generating, sharing and disseminating relevant information • Offer training and education opportunities 							
Forestry	<p>- To have sustainable utilization of forest resources</p> <p>-To conserve and protect the existing vegetation in gazetted areas, rangelands and cultivated areas</p>	<ul style="list-style-type: none"> • Increased forest cover • Sustainable use of forest resources • Communities organized into conservation groups and committees / users group • CFAs 	<ul style="list-style-type: none"> • Replanting /Enrichment planting in gazetted areas • Tree nursery development • Identify and map degraded/deforested areas/ sites • Tree planting in degraded sites • Promotion of 	<p>KFS</p> <p>MOA</p> <p>UasinGishu county Council</p> <p>Wareng Town Council</p>	3000	3000	3000	3000	3000	Budget figures are a guide

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
	<p>-To re-afforest degraded areas with suitable tree species</p> <p>-To build capacity of communities on conservation forestry</p> <p>To regulate use of forest resources</p>	<p>Protection</p> <ul style="list-style-type: none"> • committees • Reduced charcoal burning • Sustainable utilisation of forest resources 	<p>Farm forestry / agroforestry</p> <ul style="list-style-type: none"> • Awareness creation Trainings • Formation of forest / environment protection committees and groups / users association • Enactment of by laws restricting use of cedar in construction • Policy on charcoal burning • Stakeholders meeting • Regulation of herbalists 	<p>KVDA NEMA</p> <p>OOP</p> <p>DEC</p>						

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Water Resources	<p>To reduce degradation of water resources</p> <p>To reduce/Avert Water pollution</p> <p>To increase community participation in water resource management</p>	<ul style="list-style-type: none"> Improved water resource management Increased community participation in water resource management Decreased degradation of water resources 	<ul style="list-style-type: none"> Protect and conserve water resources Regulate river water abstractions Protection of spring, streams, riverbanks and the riparian reserves Undertake appropriate soil conservation measures Afforestation & Re-forestation of water catchments including hill tops Promote roof water catchments To establish water resource users associations(WRUAs) 	<p>WRMA</p> <p>Local Authorities</p> <p>Min of Public Health and Sanitation</p> <p>NEMA</p> <p>Min of Water</p> <p>Min of Agriculture</p> <p>DEC</p>	3000	3000	3000	3000	3000	"

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Land: Agriculture & Soils	To reduce High rate of soil erosion and low crop yields	<ul style="list-style-type: none"> • Reduced soil erosion/Land degradation • Increased crop productivity/food security 	<ul style="list-style-type: none"> • Initiate appropriate soil conservation measures • Promote use of mulching • Build gabions • Afforestation and Re-afforestation • Plant cover crops • Promote roof water catchment • Plant drought tolerant crops • Promote use of certified seeds • promote timely land preparation and planting • Initiate appropriate soil conservation measures • Promote indigenous crops • Promote use of farm yard manures • Promote Agroforestry 	Min. of Agriculture KFS DEC	1000	2000	2500	3000	2000	

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
			<ul style="list-style-type: none"> • Use push pull technology to reduce <i>striga</i> weeds • Crop Diversification • Plant early maturing crops Promote storm water harvesting e.g. construct water pans							
Wildlife, Biodiversity & Tourism	To reduce Human – wildlife conflict To utilise Untapped eco-tourism potential	•	<ul style="list-style-type: none"> • Establish wildlife buffer zones • Preserve the biological diversity in the district • Strengthen District Compensation Committee • Sensitize communities to appreciate the importance of conserving wildlife • Involve the communities 	NEMA KFS, KWS Min. of Tourism	2500	2500	2500	2500	2500	

					Estimated costs '000s and time					
Priority Issue	Objectives	Output	Activities	Responsible institution	09/10	10/11	11/12	12/13	2013	Remarks
			in wildlife management <ul style="list-style-type: none"> • Carry out an inventory of existing/potential tourism sites 							

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Biodiversity	To avert Loss of biodiversity		<ul style="list-style-type: none"> • Conserve biodiversity - significant areas • Regulate activities of herbal doctors with regards to access to genetic resources • Operationalise Biodiversity regulations at the District Level • Plant indigenous trees • Stop illegal logging • Preserve indigenous tree species • Protect natural ecosystems • Apply and enforce EMCA 	KFS, KWS Min. of Tourism	500	500	500	500	500	

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Climate & environmental hazards/Disasters	To reduce Frequent Drought /Famine To mitigate Flooding To manage Forest Fires		<ul style="list-style-type: none"> • Establish an active District Disaster committee • Delineate Riparian • Afforestation and Re-afforestation • Initiate appropriate soil conservation measures • Improve farming methods • Peg river banks • Construct drainage channels • Promote drought tolerant crops • Forest patrols 	OOP NEMA Min of Special Programmes Min. of Fisheries WRMA KFS Min. of Agriculture DEC	1000	1000	1000	1000	1000	“”

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Environmental Health	To reduce Prevalence of waterborne diseases	•	<ul style="list-style-type: none"> • Construct a proper drainage and sanitation facilities • Apply and enforce Public Health and Sanitation Act • Promote treatment of drinking water • Protect water sources • Apply and enforce waste management and Water • quality regulations • Construct latrines /sewer treatment facilities • Create awareness on proper hygiene • Promote use of treated mosquito nets 	Min. of Public Health and Sanitation, Local Authorities WRMA WRMA, Min. Agriculture DEC	4000	4000	20000	4000	4000	“”

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Industry & Other Business Activities			<ul style="list-style-type: none"> Promote use of cleaner production technologies Recycle polythene materials 	Min. of Public Health and Sanitation, Local Authorities Min. of Energy Min. of Industry DEC						

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Mining & Quarrying	To manage Open mining pits	Prospects for geothermal energy	Rehabilitate and restore quarried areas Fence mining areas and pits	NEMA Mines and Geology Dept. Local Authorities DEC	4000	4000	4000	4000	4000	

Priority Issue	Objectives	Output	Activities	Responsible institution	Estimated costs '000s and time					Remarks
					09/10	10/11	11/12	12/13	2013	
Settlements & Infrastructure	<p>To reduce Unplanned settlements</p> <p>To manage Poor sanitation</p> <p>To reduce prevalence of Diseases</p>	•	<ul style="list-style-type: none"> • Prepare urban development plans • Construct latrines • Promote community education on good hygiene and sanitation • Apply and enforce Public Health and Sanitation Act • Apply and enforce waste management regulations • Apply and enforce Physical Planning Act and Council Bylaws • Improve existing roads • Promote land use planning • Construction of sewerage system • Designate waste disposal sites 	Min. of Public Health and Sanitation, Local Authorities Min of lands DEC	5000	5000	10000	10000	10000	

Table 48: Monitoring and Evaluation Matrix

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Control Charcoal Burning	Charcoal permits, reduced charcoal made, less kilns	Field visits Illegal cases reported	Monthly	Forest Dept., OP, Police, DEC	Forest Dept.	Only cheap source of energy available. Alternative sources(Cheap) required. Control being effected but not effectively
Control Timber Harvesting	Timber movement permits, tree felling permits, fewer loaded trucks, more actual forest cover	Field visits Illegal cases reported	Monthly	Kenya Forest Service(KFS), OP, Police, DEC	Forest Dept	Ban on timber harvesting increased poaching
Implement Planting Program	More tree cover Planting program met	Field visits Annual reports	Annual	(KFS) Forest Dept., Private sector	Forest Dept	Heavy consumers already incorporated in planting programs
Operationalise new Forest Act	Structures in place	Operational Law		(KFS)	Forest Dept.	
Observe Land carrying Capacity	Fewer livestock, more zero grazing, reduced soil erosion	Field Visits Reports from Livestock department	Annual	Livestock Dept.	Livestock Dept.	Existing community semi pastoralists
Maintain Soil Conservation Structures	Soil Conservation Structures in place. Clear water More top soil retained, crop yield	Field visits, crop production reports, water quality reports	Annual	Depts. Of agric., water and ELDOWAS	Agric. Dept.	Mechanised farming discourage soil conservation measures
Crop rotation	Change of crop	Field visits	Annual	Agric. Dept.	Agric.	Monoculture common

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
		Agricultural reports			Dept.	
Agroforestry	AF trees on farmlands Private tree nurseries	Field visits Agricultural reports Forest reports	Annual	Forest dept. Agric. Dept. Community, CBOs, NGOs	Forest dept. Agric. Dept.	Picking up large mechanized farms lack trees
Application of organic manure	Compost pits Less inorganic fertilizer purchased/applied	Field visits Data collection, farm fertilizer outlets	Annual	Agric. Dept. Community	Agric. Dept.	
Crop diversification	Varied crops produced	Field visits Agricultural reports	Annual	Agric. Dept. Community	Agric. Dept.	Limited to small scale producers
Reduce soil pollution	Cleaner environment, higher water quality, higher soil fertility	Field visits Lab tests	Annual	Water dept., Agric. Dept, and university	Agric. Dept. Water dept.	
Control riparian reserve encroachment	Reserves not cultivated Reserves planted with fodder crops as tree cover	Field visits	Annual	Agric. Dept, OP, Water dept.	Agric. Dept. Water dept.	Problem chronic
Control quarrying and sand harvesting	Activities controlled	Field visits	Annual	Local authority	Local authority	Currently no dept. is in charge. Local authorities collect revenue for trade.
Proper waste management	Sanitary landfills in place	Field visits Reports from	Annual	Local authority	Local authority	Open dumping practiced and not controlled

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
	Dumping sites fenced and manned Littering reduced Open dumping in undesignated areas stopped	local authorities				
Enforce polluter pays principle	Revenue raised	Reported cases Returns from KRA	quarterly	NEMA, KRA, Police, OP	NEMA, Police	No guidelines to its application
Education on chemical handling	Informed community Trainings held	Interviews Returns from agriculture & Min. of Trade and Industry	Annual	Agric., Trade and Industry, community	Agric. Dept, Trade and Industry	Chemical handlers on farms are ignorant and therefore exposed
Mandatory effluent pre-treatment for factories	Treatment works in place Effluent quality at entry point to sewer system	Site visits Lab. Tests	quarterly	Trade and Industry, local authority, Water	Trade and industry, Local Authority	Some industries skip pre-treatment
Recycle/re-use polythene	Collection points established Recycle plants set up	Site visits	Annual	Trade and Industry, KNCCI, local authority, NEMA, KAM	NEMA, KNCCI, trade and Industry, KAM	National policy needed
Create Information centres	Centres in place	Site visits	Annual	NEMA, DDO, Local authorities,	NEMA, DDO,	Limited access to Moi University Library, District information

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
				Information office, Moi University, NGOs	Information office, Moi University	centers and NEMA information center in the making. Need adequate room for proper development
Hold Public Barazas	No. of Barazas held	Chiefs reports Interviews	Half yearly	OP, Lead Agencies, NGOs,CBOs, NEMA	Lead Agencies	
Hold meetings for stakeholders	No. of meetings held Minutes	Minutes Invitation letters	Half yearly	Lead Agencies, NGOs,CBOs, NEMA	Lead Agencies, NGOs, NEMA	Stakeholders meetings already initiated DEC meetings held quarterly. DDC meetings also useful. Liason meetings held as need arises.
Law implementation as per mandate	No. of court cases	Reports	monthly	Lead Agencies, NEMA	NEMA, Local authority, police	Guidelines required Environmental inspectors needed
Provide motivation	Incentives offered	Reports	Annual	Policy makers	Policy makers	
Provide cheap but standard housing units by landlords	No. of units set up Affordable rates	Reports from statistics, housing department	Annual	Housing Dept.	Housing Dept.	High cost of housing push low class people to slums
Controlled developments	No. of upgraded housing estates planned Structures in place	Field visits Reports from physical planning	Annual	Physical planning developers, local authorities, housing dept.	Physical planning , local authorities	In progress
Application of	No. of EIAs and	EIA and EA	Half yearly	NEMA, lead	NEMA,	In progress

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
environmental tools	EAs done	reports Revenue raised from experts Register perusal		agencies	DEC	
Increase coverage of rural electrification	Households covered	Reports from Energy, KPLC	Annual	Min. of Energy, KPLC, DDC	Min. of Energy	Connecting rates still very high, pace of electrification very slow and process tedious for customers
Set up sewerage treatment works for urban centres other than Eldoret town.	Treatment works in place Area of coverage No. of households and business premises served	Site visit Reports from local authorities	Annual	Local authority, physical planning, public works, housing dept.	Local authorities	Pit latrines in use leading to underground water pollution Disposal of sewer where exhauster used is not controlled
Sewer connections in Eldoret Estates	No. of connections done	Report from ELDOWAS	Half yearly	Local authorities, community, Public Health, NEMA	Eldoret Municipal Council (ELDOWAS), Public Health	Education and law enforcement required
Road grading	No. of Kms done	Site visits, Reports	Annual	Local authority, public works	Local authority, public works	Most access roads motorable but need murraming
Maintenance of drainage systems	Operational drains	Site visits, Reports	Half yearly	Local authority, public works	Local authority,	Drainage poor in Eldoret town

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
					public works	
Operationalise Disaster management Committee	Committee operational Meetings held	Minutes	Annual	Local authorities, Public Works, OP Min of Agric., Min. of Water, Forest Dept.	Public Works, OP	Committee dead
Maintain firebreaks	Firebreaks maintained	Site visits, Reports	Annual	Forest, police	Forest	In progress
Instal fire hydrants and extinguishers where necessary	No. Installed	Site visits, Reports	Annual	Local authorities, Public Works Occupational Health and safety Developers, Public Health	Occupational health and safety	Periodic check required

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Train on fire fighting	No. of trainings held No. of people trained	Reports	Annual	Local authorities, Public Works Occupational Health and safety Developers, Public Health, institutions	Occupational Health and safety Developers, institutions	Schools and other learning institutions priority areas
Have fire exits where applicable	No. of fire exits	Site visits, Reports	Annual	Occupational health and safety	Occupational health and safety	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Activity	OVIs (objectively verifiable indicators)	MoVs(Means of Verification)	Reporting schedule	Implementers	Responsible institutions for M&E	Remarks
Forest patrols	Increased vegetation cover Reduced cases of logging	No of patrols Illegal cases of logging reported Reports	Quarterly	KFS	KFS K.W.S	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Establishment of tree Nurseries	Number of seedlings raised	No. of tree nurseries established	Quarterly	KFS Community	KFS	
Tree Planting and re-forestation programmes	No. of hectares afforested	No. of trees planted	Quarterly	KFS Community	KFS	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Community sensitisation and awareness on wetland conservation	No of people sensitised	No. of trainings conducted Reports	Quarterly	Water Board WRMA	DEC Water Board WRMA	
Curb charcoal burning and transportation	Reduced cases of charcoal burning	No. of cases reported	Quarterly	Forest Dept KWS Police Provincial Administration	KFS KWS	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Identify and inventorise the existing Wetlands	No. of wetlands identified	No. of inventories(entry)	Quarterly	D.E.C Water Board WRMA Ministry of land and settlement		
Reclamation and rehabilitation of wetlands	No. of wetlands reclaimed & rehabilitated No of wetlands covered with trees	No. of wetlands identified and surveyed (functional) No of seedlings planted	Quarterly	Forest Dept	Forest Dept D.E.C County council Water boards	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Gazettelement of wetlands	No. of wetlands gazetted	No. of gazette notices	Quarterly	D.E.C Water Board WRMA Ministry of land and settlement	D.E.C	
Inventory of wetlands	No of inventories	Reports	Quarterly	D.E.C	N.E.M.A	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Hilltops survey	No of hills surveyed	Survey Reports	Quarterly	N.E.M.A County Council	N.E.M.A	
Hilltops rehabilitation	No. of Hectares planted	No. of hills planted with seedlings	Quarterly	KFS N.E.M.A Uasingishu County Council	N.E.M.A	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Re allocation of people from landslide prone areas	Landslide prone areas identified and persons living there notified	No of people reallocated	Quarterly	County Council Ministry of lands and settlement D.D.C	Ministry of lands and settlement D.D.C	
Gazettement of important catchments and hills	No. of hills and catchment areas gazetted	No. of gazette notices	Quarterly	D.E.C Water Board KFS Uasingishu County Council Ministry of land and settlement	D.E.C	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Afforestation and re-afforestation of catchments areas		No. of hectares re-afforested	Quarterly	WRMA NEMA KWS KFS	KFS Water Board WRMA	
Protection of spring, streams, riverbanks and the riparian reserves		No. of streams and springs protected No. of riparian reserves protected	Quarterly	Water Board WRMA NEMA KWS KFS Community	KFS Water Board WRMA DEC	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Survey and rehabilitation of catchment areas and riparian reserves.		No. of catchment areas surveyed No. of riparian reserves rehabilitated	Quarterly	Water Board WRMA NEMA KWS KFS Min of Lands & Settlement Community Water Users association	KFS Water Board WRMA	
Inspection of river water abstractions and water flow volumes	Reduced illegal Abstraction	Increased volume of water in the Rivers	Quarterly	Water Board C.B.O	NEMA. WRMA, Water Board	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Curb water diversions		Increased volume of water in the Rivers	Quarterly	WRMA Board Water C.B.O	DEC, Water Board	
Establish the cyclic nature of drought in the area	Established and verified cycle	Study reports Precautionary measures taken	Annual	DEC Provincial Administration	Provincial Administration	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Identify areas that suffer most from the effects of drought	Areas identified and defined	No. of areas identified Extent defined	Quarterly	DEC Provincial Administration	DEC Provincial administration Min. of Agriculture	
Identify landslide prone areas	Areas identified and defined	No. of areas identified Extent defined	Quarterly	DEC Provincial Administration		

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Re-allocate people from landslide prone areas	Precautionary measures taken to avert landslides disaster	No. of families re-located	Annual	DDC Provincial Administration	DDC Local Authorities Provincial administration	
Making conservation Structures of (e.g. gabions)	Reduced soil erosion	No. of conservation structures constructed	Quarterly	Min of Agriculture Public Works	Min of Agriculture	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Refilling of abandoned and exhausted quarries	Rehabilitated Quarries	No. of Queries Refilled	Quarterly	C.B.O NEMA Eldoret Municipal Council Uasingishu County Council	N.E.M.A	
Electric fetching around wildlife conservation areas	Reduced human/wildlife Conflicts cases	Kms of electric fence elected	Annual	K.W.S Community	K.W.S	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
KWS patrols	Reduced reported cases of poaching Reduced reported cases of human wildlife conflict	No. of patrols	Quarterly	KWS	KWS	
Creation of a migratory corridor	Reduced reported human/wildlife Conflicts cases	Establishment of the corridor progress	Annual	KWS Community UasingishuCounty Council NEMA Min. of Lands and Settlement	KWS	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Introduction of dustbins in towns	Reduced solid waste load garbage in towns	No of dustbins installed Collection trucks available	Quarterly	Eldoret Municipal council	Eldoret Municipal Council D.E.C	
Construct standard septic tanks in residential and commercial estates	Reduced over flow of sewerage into the open	No. of standard septic tanks and soak pits constructed	Annual	Eldoret Municipal council	Eldoret Municipal council D.E.C	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Regularly inspect waste disposal techniques	Improved efficiency in solid waste collection	No. of inspection visits	Quarterly	Eldoret Municipal council	Eldoret Municipal council D.E.C	
Plan for implementation of standard sewerage systems	Proper liquid waste and effluent disposal	Progress report on the level of planning and implementation	Annual	Eldoret Town council	Eldoret Town council D.E.C	The high cost of constructing a sewerage and drainage system is a limiting factor.

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Slaughter houses & other effluent source points surveillance	Reduced and well disposed effluent	No. of surveillance and inspection visits	Quarterly	Eldoret Town council Public Health	Eldoret Town council D.E.C	
Construction of sanitary landfills	No. of landfills constructed Properly disposed solid waste	No. of landfills properly used	Annual	Eldoret Town council	Eldoret Town council D.E.C	

Activity	OVI	MOV	Reporting Schedule	Implementers	Responsible Institutions	Remarks
Intensify collection of garbage	Reduced garbage accumulation in the town centres	No. of times solid waste is collected per week	Monthly	Eldoret Town council	Eldoret Town council D.E.C	
Identify alternative dumping site for Eldoret Town	Site identification and survey	Site identified	Annual	Eldoret Town council Min. of Lands & Settlement	Eldoret Town council D.E.C	

APPENDIX I

EMCA in part IV (Environmental Planning) provides for the formation of National Environment Action Plan committee and mandates it to formulate National Environmental Action Plan every five years. The same part section 39 provides for Provincial Environment Action Plan Committee to prepare Provincial Environmental Action Plan. Section 40 provides for District Environment Action Plan Committee to prepare the District Environment Action Plan every five years.

The contents of DEAP are outlined in EMCA as follows:

- a. Analysis of natural resources in the district
- b. Analytical profile of uses and value of the natural resources with consideration to intergenerational and intergenerational equity
- c. Recommendations of incentives to encourage business community to incorporate environmental requirements into their planning operational processes
- d. Recommend methods for awareness through environmental education in importance of the sustainable use of the environment
- e. Set out operational guidelines for planning and management of the environment
- f. Identify actual or likely problems as may effect the natural resources and the environment in which they exist. Identify and appraise funds in the development of urban and rural settlements, their impacts on the environment, and strategies for the amelioration of their negative impacts.
- g. Identify and appraise funds in the development of urban and rural settlements, their impacts on the environment, and strategies for the amelioration of their negative impacts.
- h. Propose guidelines for the integration of standards of environmental protection into development planning and management.
- i. Identify and recommend policy and legislative approaches for preventing, controlling, or mitigating specific as well as general adverse impacts on the environment.
- j. Prioritise areas of environmental research and outline methods of using such research findings.

APPENDIX II

	Trading Centres	Reference No.	Date Prepared	Remarks
1.	Kongnyalil	ELD.1997/99/1	25/03/1999	Submitted for approval
2.	Uswo	ELD.1998/99/1	25/03/1999	Submitted for approval
3.	Kapsaret	ELD.2172/2001/1	25/05/2001	Not Approved
4.	Simbi	ELD.2170/2001/1	25/05/2001	Not Approved
5.	Momoniati	ELD.2175/2001/1	18/06/2001	Not Approved
6.	Chepkatet	ELD.2174/2001/1	25/06/2001	Not Approved
7.	Elgon View S.C.	ELD./2001/1	26/07/2001	Not Approved
8.	Outspan Centre	ELD.2173/2001/1	06/08/2001	Not Approved
9.	Ngasra Falls	ELD./2179/1	03/09/2001	Not Approved
10.	Boderlands		17/09/2001	Not Approved
11.	Kosaji	ELD./2274/2002/1	25/07/2002	Not Approved
12.	Chegaya	ELD.1214/2002/1	26/07/2002	Not Approved
13.	Kamuyu B.		10/09/2002	Not Approved
14.	Ainabkoi East	ELD.50/84/1	14/06/1984	Not Approved
15.	Ainabkoi West		13/06/1989	Not Approved
16.	Aibabngetik	ELD.1595/97/1	07/03/1997	Not Approved
17.	Burnt Forest	ELD.50/70/3	06/01/1970	Approved (12/10/1970)
18.	Baharini	ELD.2171/2001/1A	20/07/2001	Not Approved
19.	Burnt Forest Revised	ELD.075/87/1A	27/11/1987	
20.	Bindura S.F.	ELD.1211/88/1	29/01/1988	Not Approved
21.	Chegaya (Revision)	ELD.1214/2002/1	26/7/2002 27/05/93	Not Approved
22.	Chepkigen	ELD.1600/93/1	05/10/1970	Approved(23/12/1970)
23.	Chepsaita Township	ELD.50/70/1	27/08/1986	Not Approved
24.	Cheptiret		31/03/1993	Not Approved
25.	Chepkongoni	ELD.1533/93/1	20/11/1992	Not Approved
26.	Cheukta	ELD.1590/92/1	23/10/1992	Not Approved
27.	Cheptambach	ELD.1587/92/1	13/08/1991	Not Approved
28.	Chirchir		28/11/1980	Approved (05/02/1982)
29.	Chebyemit	ELD./735/80/2	17/09/1990	Not Approved
30.	Cheplaskei		5/12/1979	Approved (25/02/1980)

	Trading Centres	Reference No.	Date Prepared	Remarks
31.	Elgeyo Border	ELD.50/79/20	24/07/2003	Not Approved
32.	Longnet	ELD.1870/97/1	20/1/2003	Not Approved
33.	Simat	ELD.2320/2003/1	15/04/2003	Not Approved
34.	Ngelel-Tarit		08/10/2004	Not Approved
35.	Chemgoror Revised	ELD.1804/2004/1	29/07/2004	Not Approved
36.	Koilel	ELD.2276/2004/1	29/1/2004	Not Approved
37.	Shawood	ELD.2324/2004/1	14/11/1984	Not Approved
38.	Flax Centre	ELD.1004/84/1A		Not Approved
39.	Gachau S.C. (Timboroa)		14/11/1984	Not Approved
40.	Field centre(Losirwa Farm)		7/7/1996	Not Approved
41.	Imani(Subukia Famers Coop Society)	ELD./832/1	30/9/1996	Not Approved
	Growel L.C.			
42.	Kesses	ELD./1865/97/1	10/5/1997	Not Approved
43.	Kipsangui	ELD./1203/88/1	7/5/1988	Not Approved
44.	Koromiat	ELD./1459/91/1	16/01/1991	Not Approved
45.	Kahuruko		20/06/1996	Not Approved
46.	Kerita	ELD./92/1532/1	01/09/1992	Not Approved
47.	Kuinet	ELD./571/82/1	14/04/1982	Not Approved
48.	Kapsundei	ELD./1216/90/1	14/06/1990	Not Approved
49.	Kimilili	ELD./1003/84/1	31/10/1984	Approved (10/11/1986)
50.	Kipkaren	ELD./1670/93/1	20/12/1993	Not Approved
51.	Kapkeno (Revision)	ELD./2328/203/1	11/10/1979	Not Approved
52.	Kamuyu		02/02/1989	Submitted for approval
53.	Kipkoriony	ELD./1585/1	01/12/1992	Not Approved
54.	Kapsiliot	ELD.1233/89/1	12/04/1989	Not Approved
55.	Kelji	ELD./1534/92/1	03/08/1992	Not Approved
56.	Katani	ELD./1531/92/1	01/04/1992	Not Approved
57.	Komblokoyet	ELD./1984/98/1	12/10/1998	Not Approved
58.	Keses	ELD./1256/88/1	06/07/1984	Not Approved
59.	Karandili		06/07/1984	Not Approved

	Trading Centres	Reference No.	Date Prepared	Remarks
60.	Kaptait	ELD./1255/93/1A	29/02/1998	Not Approved
61.	Kesses (Revised)	ELD./1457/05/01	12/10/1990	Not Approved
62.	Naiberi		15/07/1988	Not Approved
63.	Mile 13	ELD./1785/96/1	07/07/1996	Not Approved
64.	Kamukunji (Eldoret)	ELD./950/83/1	26/04/1983	Not Approved
65.	Mafuta		07/06/1993	Not Approved
66.	Menerwet	ELD./50/83/1	14/12/1983	Not Approved
67.	Moiben	ELD./59/83/1	01/03/1988	Not Approved
68.	Wareng S.C	ELD./25/83/1	28/3/1978	Not Approved
69.	Ngoisa		22/04/1987	Not Approved
70.	New Nyaru	ELD./1506/82/1	25/05/1992	Not Approved
71.	Plateau (Revised)	ELD./285/SET/1	16/06/1989	Not Approved
72.	Rock centre	/523/74/1	07/01/1974	Approved (09/09/1975)
73.	Rock Centre (revised)	ELD./1695/1	02/03/1995	Not Approved
74.	Segero	ELD./1695/99/1	25/03/1999	Not Approved
75.	Subukia(Muchorwe)	ELD./1367/90/1	15/06/1990	Not Approved
76.	Sogich S.C.	ELD.1248/1	11/06/1986	Not Approved
77.	Senetwet	ELD./2277/2001/1	24/08/2001	Not Approved
78.	Sugutek S.F.T.	ELD./1639/93/1	19/11/1993	Not Approved
79.	Sugutek	ELD./50/85/1	22/02/1984	Not approved
80.	Soy Navillus	981/86/1	31/10/1986	Approved (20/09/1989)
81.	Soy	ELD./1693/94/1	19/04/1994	Approved
82.	Turbo	ELD./250/82/1	03/03/1982	Approved
83.	Tapsangoi	ELD./34/90/1	02/1990	Approved
84.	Turbo	50/69/1	26/06/1969	Approved(25/08/1969)
85.	Ziwa Machine	ELD./3484/1	29/2/1984	Not approved
86.	Waunifour S.F.T.	ELD./1282/89/1	31/07/1989	Not Approved
87.	Yamumbi	ELD./1212/88/1	04/02/1988	“
88.	Kipsomba T.C.	ELD./1584/92/1	24/08/92	“
89.	Kipkarren T.C.	ELD./2278/2002/1	19/07/2002	“
90.	Koilunget	ELD.1359/90/1	05/06/1990	“
91.	Kapkoiga	ELD./1588/92/1	16/10/1992	“

	Trading Centres	Reference No.	Date Prepared	Remarks
92.	Kondoo	ELD./571/91/1	19/10/1991	“
93.	Kaplelach	ELD./1805/96/1A	05/09/1996	“
94.	Kaplolo	ELD.1586/92/1	29/05/1990	“
95.	Kimumu Township	ELD.1869/97/1	01/10/1997	Not approved
96.	Kagongo sub centre	ELD.50/82/2A	29/10/1992	Approved (09/10/1984)
97.	Kamungei	ELD./1594/93/1	21/01/1993	Not approved
98.	Kerio Farm T.C.	ELD./1358/89/1	14/10/1989	“
99.	Kamagut	ELD./285/95/1	07/04/1995	“
100.	Kapkures	ELD./1941/98/1	20/03/1998	“
101.	Kaplelach	ELD./1233/8/8/1	19/08/1988	“
102.	Kipsaos Township		13/12/1989	“
103.	Longnet (Revision)	ELD.740/89/1	15/05/1989	“
104.	Lolkinyei	ELD./1870/2003/1	24/07/2003	“
105.	Lesarkech	ELD./1608/93/1	26/04/1993	“
106.	Lessos Township	ELD./1727/95/1	27/02/1995	“
107.	Lessos M.K.T	ELD./50/62/22	16/08/1971	Approved (09/05/1963)
108.	Matunda		19/12/1979	Not approved
109.	Mile Nne centre	ELD.781/87/1	05/11/1987	“
110.	Manzini	ELD./17/92/116A	023/12/1992	Approved
111.	Marura	ELD./1806/2000/1	06/10/2000	
112.	Moiben	ELD./1985/99/1	02/09/1999	
113.	Moi's Bridge	ELD./25/82/1	07/05/1982	Approved (29/12/1983)
114.	Marura (Revised)	ELD./188/82/1	23/03/1982	Not approved
115.	Merewet A.	ELD./1985/98/1	24/08/1988	“
116.	Mogoiwet	ELD./1807/96/1	01/10/1996	Approved
117.	Mugundoi	ELD./1458/91/1	25/01/1991	Not approved
118.	Mugoiwo	ELD./771/90/1A	24/06/1990	“
119.	Moi's Bridge Township	1475/91/1	01/08/1991	“
120.	(Revision)	ELD./188/90/1	20/03/1990	Not Approved