KERIO VALLEY
Integrated Regional Development Master Plan:
(2013-2033)
FOREWORD

Kerio Valley Development Authority (KVDA) is one of the six Regional Development Authorities (RDAs) in Kenya, established by an Act of Parliament CAP 441 with a mandate to, in part, initiate, plan and develop resources along the Kerio River basin. The Kerio Valley Region covers the counties of West Pokot, Turkana, Baringo, Elgeyo Marakwet, and part of Samburu and Nakuru Counties, with an estimated population of about 3 million people. As part of its planning mandate, KVDA embarked on the preparation of an Integrated Regional Development Master Plan (IRDMP) 2013-2033 that identifies resources in the region and provides a roadmap for optimal utilization, with a view to livelihoods improvement in the region. The IRDMP is aligned to the Kenya Vision 2030 and provides strategies for among others peace-building initiatives, irrigation-led agriculture, mineral exploration, value addition and conservation of water catchment areas such as Cherangany Hills Water Tower.

The IRDMP has among others analysed the following;

- Identification of all natural resources in KVDA’s area of jurisdiction and thus prepared a resource inventory based on their level of utilization and possible ways to enhance their sustainable exploitation.
- Analysis of human development or socio-economic status including community profiles, infrastructure and economic development.
- Analysis of present policy programmes and institutions.
- Provision of a Geographical Information Systems (GIS) platform incorporating a spatial framework for human settlements and provision of adequate infrastructure and services.
- Identification and mapping of environmental and ecologically sensitive areas and set out measures for their conservation, enhancement and restoration.
- Provision of avenues for poverty reduction, wealth and employment creation.
- Formulation of institutional organization measures to facilitate the implementation of the IRDMP.
- Development of short and long-term integrated sustainable programmes, strategies and flag-ship projects on possible Special Economic Zones, agriculture and livestock improvement zones among others, for immediate investment and exploitation of the identified existing natural resources that will maximize integrated development in the Kerio Region.
- Formulation of an implementation strategy, which outlines the mechanisms for financing, capacity building, communication and monitoring and evaluation.

The preparation process of the IRDMP was an all-inclusive process that engaged all stakeholders through various forums. Five county forums were held to capture the people’s needs and aspirations as provided for in Constitution of Kenya, 2010. In addition, the Authority did a consultative session with the newly elected leaders in the region on 8th April, 2013. These included the Governors, Senators, Deputy Governors and Members of Parliament from all the five Counties under KVDA area of jurisdiction and also those from Nandi and Uasin Gishu County. The document also underwent a final technical evaluation workshop between the 6th and 7th of June 2013 for final validation, involving the Director of Physical Planning, the Consultants, the Deputy Governors of the five counties covered by the Master Plan, KVDA’s technical personell and other relevant stakeholders.

It is expected that upon implementation of this IRDMP, the region will transform into an engine of economic growth in the North Rift. The document is an important anchor for the development of county integrated plans of West Pokot, Turkana, Baringo, Elgeyo Marakwet and Samburu.

In light of the foregoing, KVDA acknowledges that cooperation with the five county governments will be crucial for the implementation of Master Plan. KVDA looks forward to playing its rightful role as outlined in the IRDMP as a knowledge hub, resource lobbyist and mobilizer, and the key coordinating agency in the implementation process of this plan.

David Kimosop,
Managing Director.
ACKNOWLEDGEMENTS

This Integrated Regional Development Master Plan for Kerio Valley Development Authority (KVDA) has been prepared through a consultative process involving varied stakeholders in the North Rift region, under the guidance of the Consultants, Two Ems Associates Limited. Key among them were David Kimosop (Managing Director) who served as a Liaison between the consultant and the Board of Directors, Sophia Lepuchirit (Chairperson, KVDA Board) Francis Kipkech (Deputy Managing Director), Mr. Peter Biwott (immediate former Planning Manager) and the Board of Directors who guided the process from inception to completion. This document could also not have been prepared without the invaluable input on the legal anchor to the plan preparation and approval process from the Director of Physical Planning, Augustine Masinde, and his team.

We remain grateful to H.E the Governors, Deputy Governors and Senators as follows: H.E. Josephat Nanok (Governor, Turkana County), H.E. Simion Kachapin (Governor, West Pokot County), Senator John Lanyangapuo (Senator, West Pokot County), H.E. Alex Tolgos (Governor, Elgeyo Marakwet County), Senator Kipchumba Murkomen (Senator, Elgeyo Marakwet County), H.E. Cheboi Chesire (Governor, Baringo County), H.E. Moses Kasaine (Governor, Samburu County) Senator Sammy Leshore (Senator, Samburu County), the Speaker of Senate Senator Ekwe Ethuro, Senator Naisula Lesuuda (Nominated Senator), H.E. Jackson Mandago (Governor, Uasin Gishu County), H.E. Peter Ekai Lokoel (Deputy Governor, Turkana County), H.E. Titus Lotee (Deputy Governor, West Pokot County), H.E. James Kipkosgei Murgor (Deputy Governor, Elgeyo Marakwet County), H.E. Mathew Kipyator Tuitoek (Deputy Governor, Baringo County), H.E Joseph Lemarkat (Deputy Governor, Samburu County), the Members of Parliament and Women Members of Parliament. We acknowledge with thanks the support, patience and persistence from these leaders and their continued collaboration in the preparation and development process.

The team benefitted greatly from consultations in the field with the relevant county officers in particular: District Commissioners, District Livestock Officers, District Agriculture Officers, District Development Officers, District Physical Planning Officers, District Public Health Officers, District Education Officers, Kenya Forest Service, Chief Warden Lake Bogoria National Reserve (William Kimosop, for his wealth of tourism knowledge), the District Peace Committees and the members of the public in all the Districts under the KVDA jurisdiction among other relevant stakeholders who provided both literature and verbal information to further enrich this document. As it is not possible to list the names of all these persons in this section of the report, a detailed list of all these contact persons has been attached as an appendix to this report.

To all of you, thank you and we look forward to your continued engagement and support in building the Kerio Region as an engine for economic empowerment in the North Rift.

The findings and views expressed therein are exclusively those of the Consultant and consulted stakeholders and do not necessarily represent the views of the Government of Kenya.

God Bless You All.
Table of Contents

CHAPTER ONE: INTRODUCTION
1
1.1 BACKGROUND TO THE STUDY:
1.1.1 Overview: 1
1.1.2 Delineation of the Study Area 1
1.1.3 Benchmarking Case Studies: River Basin Master Planning 3

1.2 CONTEXTUALIZATION
1.2.1 Overview 10
1.2.2 Structuring Elements of KVDA 17
1.2.3 Common Water Related Problems in River Based Basins 18
   a) Institutional Crisis 18
   b) Trans-Boundary Issues 18
   c) Managing Watersheds and River Basins: Top-Down, Bottom-Up, or Both? 19
1.2.4 Guidelines Relating to Integrated Basin Management 19
1.2.5 Summary of Issues in KVDA Region 25

1.3 METHODOLOGY ADOPTED FOR THE STUDY:
1.3.1 Scope of Study: 21
1.3.2 Data Collection Process: 22
1.3.3 Data Analysis and Presentation Process: 27

1.4 RATIONALE OF THE PREPARATION OF THE KERIO VALLEY IRDMP:

CHAPTER TWO: POLICY CONTEXT AND INSTITUTIONAL FRAMEWORK
28
2.1 OVERVIEW 28
2.2 POLICY FRAMEWORK
2.2.1 Agenda21 28
2.2.2 Human Settlements and housing policy 28
2.2.3 Millennium Development Goals (MDG) 28
2.2.4 National Land Policy 34
2.2.5 National Spatial Plan 34
2.2.6 National Urban development Policy 35
2.2.7 Regional Development Policy 35
2.2.8 Sessional Paper No 2 of 2005: Development of Micro and Small Enterprises for Wealth and Employment Creation for Poverty Reduction 35
2.2.9 Other Relevant Policies: 36

2.3 LEGAL FRAMEWORK 36
2.3.1 Regional Planning Under the Old Constitution 36
2.3.2 Regional Planning Under the New Constitution 36
   a) The Constitution of Kenya 36
   b) The Urban Areas and Cities Act, 2011 39
   c) The Intergovernmental Relations Act, 2012 39
   d) The Transition to Devolved Government Act, 2012 39
   e) Land Legislation under the New Constitution 39
2.3.3 Legislation relevant to Integrated Regional Planning 40
   a) Cap 441, laws of Kenya 40
   b) The physical Planning Act Cap, 286 40
   c) Forest Act chapter 385 40
   d) Environmental Management and Coordination Act, 1999 40
   e) Water Act 2002 41
   f) Agriculture Act 41
   g) Wildlife (conservation and Management) Act 41
   h) Energy Act No. 12 2006 41

2.4 INSTITUTIONAL FRAMEWORK 42
2.4.1 Overview 42
2.4.2 COUNTY GOVERNMENT 42
2.4.3 CENTRAL GOVERNMENT 44
2.4.4 CIVIL SOCIETY 44
# Table of Contents

Challenges faced by the Civil Society groups 47
2.4.5 PRIVATE SECTOR 47

2.5 KERIO VALLEY DEVELOPMENT AUTHORITY 47
2.5.1 Institutional structure 48
2.5.2 Assessment of KVDAs Capacity 48

2.6 SWOT analysis of Institutions Sector 49
2.6 SWOT Analysis of Institutions Sector 51

## CHAPTER THREE: PHYSICAL FEATURES AND ENVIRONMENT

3.1 TOPOGRAPHY AND SLOPE ANALYSIS 52
3.1.1 Overview 52
3.1.2 Landforms 54
   a) Mountains and Hills 54
   b) Escarpments 54
   c) Plains 54
   d) Valleys 55
3.1.3 Emerging issues 55

3.2 HYDROLOGY AND DRAINAGE SYSTEMS 55
3.2.1 Overview 55
3.2.2 Lake Turkana Basin 57
   a) Lake Turkana Catchment 58
   b) Lake Bogoria and Baringo Catchment 60
   c) Kerio River Catchment 62
   d) The Suam/Turkwell River Basin 64
   e) Suguta River Catchment 66
   f) The Omo River 67
3.2.3 Lotikipi Plains Basin 68
3.2.4 Underground Water 69

3.3 GEOLOGICAL AND SOIL CHARACTERISTICS 70
3.3.1 Overview 70
3.3.2 Geological Characteristics 70
3.3.3 Soil Characteristics 72
3.3.4 Mineral Resources 73
3.3.5 Emerging issues 74

3.4 CLIMATE 74
3.4.1 Overview 74
3.4.2 Rainfall 75
3.4.3 Temperature 77
3.4.4 Humidity 77
3.4.5 Sunshine 77
3.4.6 Winds 77
3.4.7 Emerging Issues 78

3.5 VEGETATION CHARACTERISTICS 79
3.5.1 Overview 79
3.5.2 Forests 79
   a) Cherangany Hills Forest 80
   g) Marmanet Forests 82
   h) Mau Complex 83
3.5.3 Range lands 84
3.5.4 Emerging issues 84

3.6 AGRO ECOLOGICAL ZONES 84
3.6.1 Overview 84
3.6.2 Humid Zone 85
3.6.3 Sub-Humid Zone 85
3.6.4 Dry Sub-Humid 85
3.6.5 Semi–Arid Zone 85
# Table of Contents

## 4.3 URBAN/RURAL POPULATION
- Overview
- Urban/Rural Population within KVDA Region
- Emerging Issues

## 4.4 POPULATION PROJECTIONS
- Overview
- 4.4.1 Population Projections KVDA Region
- Emerging Issues

## 4.5 HUMAN RESOURCE DEVELOPMENT
- Overview
- 4.5.1 Literacy Levels
- Education Institutions
- Emerging Issues

## 4.6 IMPACT OF HIV/AIDS
- 4.6.1 Overview

## 5.0 COMMUNITY PROFILES
- OVERVIEW
- Important Aspects in Culture Crucial to Sustainable Development

### 5.1 COMMUNITIES AND THEIR CULTURES
- 5.1.1 Samburu Community
- 5.1.2 Turkana Community
- 5.1.3 Elmolo Community
- 5.1.4 Pokot Community
- 5.1.4 Ilchamus Community
- 5.1.5 Tugen Community
- 5.1.6 Marakwet Community
- 5.1.7 Keiyo Community

### 5.2 CULTURE AND GENDER ISSUES

### 5.4 CONFLICTS, CONFLICT RESOLUTION [CULTURAL]
- 5.4.1 INTRODUCTION
- 5.4.2 TYPES OF CONFLICTS
  - 5.4.2.1 CATTLE RUSTLING
  - 5.4.2.2 RESOURCE BASED CONFLICTS
  - 5.4.2.3 BORDER CONFLICTS
- 5.4.3 POTENTIAL SOURCES OF CONFLICT
  - 5.4.3.1 THE ILEMI TRIANGLE [A TIME BOMB]
  - 5.4.3.2 KAKUMA REFUGEE CAMP [XENOPHOBIA]
  - 5.4.3.3 OIL DISCOVERY [THE CURSE OF AFRICA]
- 5.4.4 CONFLICT RESOLUTION MECHANISMS

## CHAPTER SIX: ECONOMIC PROFILE

### 6.1 Overview

### 6.2 GDP of the KVDA Region

### 6.3 Economic activities

### 6.4 Livestock
- 6.4.1 INTRODUCTION
- 6.4.2 Livestock Population in the KVDA Region
- 6.4.3 CONTRIBUTION TO REGIONAL GDP
- 6.4.4 REARING AND MANAGEMENT PRACTICES
- 6.4.5 LEVEL OF EXTENSION SERVICES
- The main extension services provided by the Ministry include the following:
- 6.4.6 MARKETING CHANNELS
- 6.4.7 DISEASE PREVALENCE
## Table of Contents

6.4.8 VALUE ADDITION OPPORTUNITIES 171  
6.4.10 FISHERIES 172  
6.4.11 APICULTURE 174  
6.4.12 SWOT Analysis of Livestock Subsector 175  
6.5 AGRICULTURE 176  
6.5.3 AGRO ECOLOGICAL ZONES 177  
6.5.4 LAND POTENTIAL AND AVERAGE LAND HOLDING 177  
6.5.5 IRRIGATION POTENTIAL 178  
6.5.6 VALUE ADDITION 179  
6.5.7 STATE OF AGRICULTURAL RESEARCH IN THE REGION 179  
6.5.8 FOOD SECURITY 180  
6.5.9 FOOD PER CAPITA 181  
6.5.10 MARKETING CHANNELS 181  
6.5.11 ENVIRONMENTAL IMPACTS OF AGRICULTURE 183  
6.5.12 COUNTY CROP PRODUCTION 183  
   a) BARINGO COUNTY 183  
   b) ELGEYO/MARAKWET COUNTY 185  
   c) TURKANA COUNTY 187  
   d) SAMBURU COUNTY 191  
6.5.13 Challenges in Crop production in the Region 193  
6.5.14 Untapped agricultural potential 193  
6.5.15 SWOT Analysis of the Sector 195  
6.6 PRIVATE SECTOR MSME’s INVESTMENT; CONSTRAINTS, DRIVERS AND ENABLERS 195  
6.6.1 Introduction 195  
6.6.3 SME CONSTRAINTS IN KVDA REGION 198  
6.6.4 SME ENABLERS 199  
   1. Macroeconomic Conditions 199  
      a) General Business Conditions 199  
      b) Human Resource 200  
      c) Transportation [Cost and Reliability] 200  
      d) Utilities [Electricity, Water, and Telecommunications] 201  
      e) Quality of Life 201  
   2. Accessibility to Financing 201  
   3. Proper Policy and Regulatory Framework 202  
   4. Level of Government facilitation for SME growth 202  
6.7 TOURISM 202  
6.7.1 Trends in the Tourism Economy and Visitor Distribution 203  
6.7.3 Emerging Issues 207  
6.7.4 SWOT analysis of the sector 208  
6.8 SEZ DEVELOPMENT 208  
6.8.1 Overview 208  
6.8.2 Permitted Activities within a SEZ 208  
6.8.3 Proposed incentives SEZ 209  
6.8.4 SEZ Drivers 209  
6.8.5 SITE SELECTION CRITERIA 213  

CHAPTER SEVEN: HUMAN SETTLEMENT STRUCTURE, LAND USE AND TENURE SYSTEMS 214  
7.1 Human Settlements Structure 214  
   7.1.1 Human Settlements Profiles: Turkana County 215  
   7.1.2 Human Settlements In West Pokot County 216  
   7.1.3 Human Settlement In Baringo 217  
   7.1.4 Human Settlement In Elgeyo Marakwet County 218  
   7.1.5 Human Settlement In Samburu 219  
7.2 Urbanization Trends 220  
7.3 Drivers of urbanization in the KVDA Region 221  
   7.3.1 Urbanization in Turkana County 222
Table of Contents

7.3.2 Urbanization in Samburu County 222
7.3.3 Urbanization in Baringo County 223
7.3.4 Urbanization in Elgeyo Marakwet County 223
7.2.6 HUMAN SETTLEMENTS PROFILES: WEST POKOT COUNTY 224
7.3 PLANNING IMPLICATIONS HUMAN SETTLEMENTS 224
7.4 HOUSING WITHIN KERIO VALLEY 225
7.5 LAND USE AND TENURE SYSTEMS 227
7.5.1 Overview 227
7.5.2 Land Use Patterns in Kerio Valley: 228
7.5.3 Land Tenure Systems in Kerio Valley 229
CHAPTER 8: INFRASTRUCTURE, UTILITIES AND SERVICES 232
8.1 PHYSICAL INFRASTRUCTURE 232
8.1.1 Transport 232
8.1.3 Water and Sanitation Infrastructure 253
8.1.4 Information, Communication And Technology 259
8.1.5 Overall Emerging Issues of Physical Infrastructure 263
8.2 SOCIAL INFRASTRUCTURE 265
8.2.1 Education 265
8.2.2 Health 270
8.2.3 Security 274
8.2.4 Recreation And Sport 277
8.3 SWOT ANALYSIS 278
CHAPTER 9: CONTEXT AND OBJECTIVES OF A GROWTH POLES STRATEGY IN KERIO VALLEY 280
Overview 280
9.1 Growth Potential Analysis In KVDA 280
9.1.1 Tourism-Based Growth Potential 280
9.1.2 Natural Resource Based Growth Potential 281
9.1.3 LAPSET Based Growth Potential 281
9.1.4 Agriculture/Livestock Based Growth Potential. 282
9.1.5 Integrated Resource Based Growth Analysis 282
CHAPTER 10: SUMMARY OF EMERGING ISSUES 283
10.1 General Issues 283
10.2. Basin Specific Emerging Issues 284
10.2.1 L. Turkana Catchment 284
10.2.2 L. Bogoria Catchment 284
10.2.3 L. Baringo Catchment 284
10.2.4 Kerio River Catchment 285
10.2.5 Lotikipi Basin 285
CHAPTER 11: 289
11.1 Introduction 289
11.2 Vision 291
11.3 Planning Perspective 291
11.3.1 Summary of Main Challenges Causes: 291
11.3.2 Main Opportunities in Study Area: 292
11.3.3 Branding: 293
11.4 Proposed Development Models 299
11.4.1 Economic Development Model 299
11.4.2 Infrastructure Development Model 307
11.4.3 Natural Resources Development & Green Growth Model 318
11.4.4 Settlement Structure Development Model (Spatial Development) 331
11.4.5 Social Development Model 334
11.4.6 Institutional Reform Strategy 340
11.4.7 Monitoring And Evaluation Model 344

11.5 Flagship Projects: To Transform The KVDA Region 347
   Overview 347
   11.5.1 Regional Peace Building Flagship Projects/ Initiative [Cross County Cutting] 348
   11.5.2 Agro-Village Flagship Project 349
   11.5.3 Livestock Improvement Village 349
   11.5.4 Conservation Flagship Projects 350
   11.5.5 Special Economic Zone Flagship Projects 352
   11.5.6 Bio-Extraction And Value Addition Herbal Plants 352
   11.5.7 Stadium Complex Flagship Project 357
   11.5.8 Water And Irrigation Development Flagship Projects 357
   11.5.9 Implementation Schedule Of The Flagship Projects 358

11.6 Implementation Plan: County-Specific Interventions for KVDA 360

11.7 Implementation Plan: County-Specific Interventions for KVDA 361
   11.7.1 Elgeyo Marakwet County: 361
   11.7.2 Turkana County: 361
   11.7.3 West Pokot County: 362
   11.7.4 Baringo County: 363
   11.7.5 Samburu County: 364
   11.7.6 Trans-Boundary Interventions: 365

REFERENCES 368
EXECUTIVE SUMMARY

The Government of Kenya, created six resource based Regional Development Authorities, (RDAs) to complement the work of the line ministries through planning, developing and implementing multi-sectoral and coordinated development programmes and projects in their respective regions. One of these, Kerio Valley Development Authority (KVDA), established in 1979, was tasked with identifying, planning, coordinating and implementing projects that enhance communities’ incomes, promote environmental conservation and socio-economic development. It’s through this objective, that the Authority mandated Two Emerg Associates Limited to prepare an Integrated Regional Development Master Plan (IRDMP) for the areas under its jurisdiction, [the counties of Turkana, West Pokot, Elgeyo Marakwet, Baringo, some areas of Samburu and Naku-ru]. Two water basins, (Lake Turkana and Lotikipi Plains water basins) delineate KVDA’s area of jurisdiction, with six catchments namely; Lake Turkana Catchment, Lakes Baringo- Bogoria Catchment, Suam/Turkwell Catchment, Kerio River Catchment, Suguta/ L. Lotikipi Catchment and Tarach/Lotikipi Catchment.

This IRDMP has been prepared through a comprehensive collection of data from detailed literature review, reconnaissance surveys, GIS mapping, household field surveys, key informant interviews and stakeholder consultative meetings. The data collected was subjected to analysis and presented to the key stakeholders in five county forums, two forums with Governors and Senators from the region, and a final technical validation workshop between the Consultants, KVDA, the Director of Physical Planning and Deputy Governors from all the five counties.

The expiry of the 1986-2007 Master Plan necessitated the preparation of a new integrated master plan to address the changes that have taken place as well as the new policies, which were not in place, such as the Kenya Vision 2030, 2007 Regional Development Authorities Policy, the new Constitution and the Millennium Development Goals. This plan is prepared against a backdrop of the changing dispensation ignited by the Constitution of Kenya (2010) that provides for devolution (Section 185) and Inter County Planning under article 6(2). Towards the achievement of Section 185, The County Government’s Act has been enacted, detailing how planning should happen at the devolved level, outlining specific emphasis to Integrated Regional Planning. The planning process adopted, follows the provisions of the Physical Planning Act CAP 286, among others such as the Energy Act No. 12 2006, Wildlife Act, Agriculture Act, Water Act 2002, Environmental Management and Coordination Act, 1999, CAP 441 and Forest Act CAP 385.

There are five types of institutions, (which are the agents of implementation of development plans) in the region: county governments, central government institutions/parastatals, the private sector, the civil societies and donor agencies. Collaboration between these institutions is minimal, hence leading to duplication of efforts. The lead implementing agent of this IRDMP, KVDA, has operational challenges that include: overreliance on the ex-chequer, heavy salary expenditure, bottom-heavy staffing, large Board of Directors, and skewed focus on low impact development interventions. This is further compounded with operational challenges since RDAs are not clearly anchored within the Constitution, making their roles and mandates quite unclear.

Three distinct topographic zones characterize the Kerio Valley region; the highland plateau (2500m-3000m), the steep escarpments (1200m-2000m) and the valley floor (300m-900m) stretching from Koibatek in Baringo County to Lake Turkana. Prominent features include Cherangany Hills (3500 m), Keiyo Escarpment, Tugen Hills and isolated mountain ranges in the Turkana County. The region lies in two main basins; Lotikipi Plains Basin and Lake Turkana basin. The Lake Turkana Basin covers more than two-thirds of the region (209 157 km2) and can be subdivided into five catchment areas namely; the Lake Baringo/Bogoria catchment (4,835 km2), Lake Turkana catchment, the Suam/Turkwell River and Kerio River catchments (which combined cover 35,800 km2) and the Suguta/L. Logipi water catchments.

The Omo River basin is the most important as it contributes to over 90% of Lake Turkana’s inflow with the rest of the water catchments in this basin contributing less than 10%. Any changes in the quality and quantity of the Omo River waters, therefore directly affect the lake ecology. Lake Turkana, previously a shared resource between Kenya and Ethiopia, now lies squarely in Kenya as a result of the expanding Omo delta. Boreholes have been sunk within the region meaning that there are substantial ground water sources, with sub-surface water sources tapped by shallow wells and pans. Most of these boreholes are sited in the volcanic rocks and yields between 5 and 25 m3/hr. Areas with pre-cambrian metamorphic and igneous rocks yields very little water (between 1.5-6 m3/hr).

The KVDA region is characterized by four dominant geological formations, which include; the Precambrian Basement system rocks, Tertiary volcanic rocks, Quaternary volcanic rocks and Quaternary to Recent sediments. Distribution of soils in the region is complex having been influenced by the extensive variations in relief, volcanic activity and underlying rock types. The upland soils are of two categories: those developed on olivine basalt and ashes of old volcanoes and those developed on undifferentiated basement system rocks, mainly gneiss (ibid). The highlands soils are fertile and deep except for the north-western area, where soils are generally shallow. The upland soils, often occur with rock outcrops and their topsoil...
is rich in organic matter and thus of high water absorption capacity. On the other hand, the escarpment comprises of infertile and shallow soils due to erosion on the steep slopes. Minerals with large scale mining potential within the region includes Fluorspar in Kerio Valley, Limestone in West Pokot, building stones in Baringo and Elgeyo Marakwet and construction sand in Metamorphic Belts.

KVDA region, which is predominantly Arid and Semi-Arid (ASAL), is a climatically diverse area with extreme variations, with topography being the main factor that affects climate in this region. Generally, the region receives a bimodal type of rainfall with long rains being received in March through April and short rains starting from July to September. Mean annual rainfall ranges from 1000 mm for the highlands and between 200 mm to 800 mm for the dry low land. Temperatures in the region are generally very high and vary with altitude, ranging from 10°C in the Cherangany hills and Tugen Hills, to a maximum of 40°C in the lowlands. The area receives an average of 11 hours of sunshine a day. The Northern plains receive sunshine early and have longer sunshine hours as compared to the montane areas.

Vegetation distribution in the region is affected by altitude. The high altitude mountain areas are covered by different forest-types, depending on climatic and edaphic factors. These forests gradually change to various bush land-types along the hillsides and escarpments, eventually giving way to rangeland-types, which dominate the low-lying areas. The higher altitude areas correspond to location high-potential agriculture, resulting in man-made vegetation types as well as medium-to high-potential livestock pastures. Essentially, there are three types of forests within the region; Gazetted natural forests, Gazetted plantation forests and Non-gazetted natural forests and woodlands. There is approximately a total of 2900 km² of gazetted natural forests within the KVDA area (Kenya Gazette, various issues). Cherangany forest complex is the largest and most important forest in the region. The forests cover an area of some 120,000Ha, and form the upper catchments of the Kerio and Turkwell rivers. It is considered one of the five main water towers of the country. It is approximated that the forest is losing at-least 153 ha of forested land after every three years.

Since 80% of the region lies within the ASAL zone, the predominant land use is pastoralism. Thus land use in the KVDA area is mainly for livestock husbandry and crop production. Arable land occupies 39% of the region. Land use patterns and practices are also closely related to the conservation of agricultural biodiversity and soil erosion, resulting mainly in hillside cultivation, which is one of the major threats to the environment in the region particularly when associated with monoculture farming.

The region has abundant wildlife resources, found in over nine protected areas. While all the nine protected areas are home to diverse animal and bird populations, Lake Bogoria National Reserve that has up to 135 species of birds recorded is the most visited in the North Rift.

The KVDA region is as well very rich in green energy resources. The Rift Valley system, which bisects the KVDA area from North to South, is rich in geothermal energy potential. It is evidenced by the numerous hot springs, particularly on the east side of the valley near Lake Bogoria, Solai, Kapeno and along the Suguta River. The diverse river resources, (such as Arror, Kerio, Kimwarer, Molo, Waseges, Morun and Pekerra) point to a rich potential for hydropower energy generation within the region. Based on the long sunshine hours, it is feasible to utilize solar energy devices in most of the KVDA region, particularly Baringo, Northwest Pokot and Turkana. Wind energy is a potential source of power especially around Lake Turkana. Interest in oil prospecting has increased in the region with commercially potential oil deposits discovered in Turkana County.

There are various environmental challenges facing the region such as deforestation, soil erosion, siltation of water bodies, and flash floods amongst others. Climate change has impacted the region negatively, resulting in heavy floods and severe droughts, especially in Baringo, Turkana and Samburu counties. These regions experience dry weather conditions causing pressure on the existing pastures and water resources on which the communities depend for survival.

The total population of the KVDA region is 2,458,501 persons with a total rural population of 2,153,398 and total urban population of 305,103. Of this, Turkana has the highest population (855,399 persons and the highest poverty index of 94.3%), followed by Baringo (555,561 persons), West Pokot (512,690 persons), Elgeyo Marakwet (369,998 persons), Samburu (164,853 persons). It is however crucial to note that Samburu County has the smallest population because only a portion of it (Samburu North and Samburu Central districts) makes up part of KVDA's region. The male to female population ratio is almost at par in the region except in Turkana County, where the male population is more than the female population. The largest portion of the population is aged between 0 and 40 years, with the bulk of this in the 0-14 age bracket indicating a high dependency rate. It is important to note that the youthful population, which is the most productive, is as well the highest in proportion. Few employment opportunities as well as minimal credit facilities exist within the region meaning that most youth are idle contributing little to the economy of the region.
The KVDA region generally has low literacy levels. This is mainly attributed to retrogressive cultural practices like early marriages for girls and moranism for boys, inaccessibility to education facilities due to long distances, harsh weather conditions, high poverty levels and lack of prioritization of education by parents. The highest level of education reached in most of the KVDA region is primary school level. Transition rates to other levels such as secondary and tertiary institutions are low indicating that very little of the population has attained skills that can be used for economic activities in the region, and hence the over-reliance on pastoralism. HIV/AIDS is also a challenge to the population within the region with socio-cultural factors playing a significant role in contributing in its prevalence, from practices such as circumcision, polygamy, wife sharing, female genital mutilation, and early marriage, among others. In addition, commercial sex workers, pre-marital and extra-marital sex, and migration among the male workers, contribute to the prevalence of the epidemic as well.

Kerio Valley region is home to a diversity of cultures and communities such as the Samburu, Turkana, Keiyo, Marakwet, Tugen and other Kalenjin speaking communities. The region is also home to the smallest communities in Kenya such as the Elmolo and the Ichemus. The Elmolo tribe, found on the south-eastern shores of Lake Turkana, is the smallest community in Kenya, while the Ichemus people, who are the second smallest community in Kenya, live in the Lake Baringo lowlands. In all these communities, there is gender inequality characterized by low participation of women in decision-making and disempowerment of women from inheriting of land and ownership of property or livestock.

In this predominantly ASAL region, majority of the people are pastoralists in constant search of pasture and water resources for their cattle, resulting in resource conflicts and inter-communal wars. The major types of conflict within the region are: cattle-rustling, ethnic conflicts, boundary conflicts, resource conflicts, highway banditry and land conflicts. Cattle-rustling which is the main conflict in the area relates to rivalry over both use/ownership of resources and boundaries among various communities such as the Pokot-Turkana, Turkana-Samburu, Pokot-Marakwet, Turkana-Merille (Ethiopia), the Pokot-Karamajong (Uganda) and the Turkana-Toposa (Sudan). These conflicts are accelerated by the proliferation of small arms, porous borders and commercialization of cattle rustling within the region.

The main economic activities in the KVDA region are: livestock keeping, agriculture, tourism, commerce, trade and industries. In estimation of the region’s GDP using the income approach, only income from agriculture (approximately Ksh 24.1 billion) was used, due to the largely undocumented and informal nature of businesses. The region is 80% ASAL, which is suitable for livestock production (the highest livestock population in Kenya is found within this region). There is exclusive nomadic pastoralism in Turkana, West Pokot, Samburu and parts of Baringo Counties while Elgeyo Marakwet and parts of Baringo counties practice intensive and semi-intensive zero grazing. Extension services are offered by both the government and private organizations but are hindered by the vastness of the region and the poor state of infrastructure. The main challenges facing livestock production in the region include drought (up to 40% of the herd is lost) and lack of proper value addition on the available livestock products (limiting incomes). Climate change has made this situation worse pointing to the need for diversification of livelihoods. Communities on the other hand have adopted both indigenous and modern methods of coping with drought such as storage of fodder, off stocking and indigenous methods such as preservation of enclosures for dry season grazing and seasonal migration.

Most of the counties under the KVDA area, in a national context are not considered prime crop production zones. Present day agriculture in the area utilizes both rain-fed and irrigation systems, and is done mostly on a subsistence level. Value addition is also not well developed just like the national context. The river basin has irrigation potential of 64,000Ha of land, but only 5,477Ha has been developed. The region has persistent food insecurity mostly occasioned by the persistent drought and climate change variation. There are three agro ecological zones and the crops that can do well differ according to the zones, these are: Humid-sub humid zone (Elgeyo Marakwet, parts of Baringo and West Pokot), Sub-humid-semi-arid one (West Pokot, Baringo and Samburu), and the Semi arid–arid zone (Samburu, Turkana).

The main crops grown in the region include: maize and beans, wheat, Irish potatoes, vegetables, fruits such as mangoes and pawpaws, cow peas and green peas among others, on small holder farms and mainly for subsistence farming. The main challenges in crop production is climate variation which affects the rainfall pattern, the poor infrastructure inhibiting access to the markets affecting the ability of the farmers to reach customers and they therefore fetch very low prices. Untapped and underutilized crops potentials include: sisal, cotton and pyrethrum, which have potential to be produce in the region.

The Small and Medium Enterprises (SMEs) have the potential to contribute significantly to economic growth and poverty reduction (through increased production and employment); Kenyan SMEs contribute only 20% of GDP even when contributing about 80% of employment. The most prominent form of SMEs in the KVDA region are traders, both wholesale and retail, honey processing, agro trade and hotel industry amongst others. Data on the SMEs con-
ttribution to regional GDP is rarely documented, but there is a lot of untapped potential for development in this sector. Challenges facing the sector however were identified as poor infrastructure, high cost of licenses, insecurity, low turnover and lack of capital as the main constraints to doing business in the region.

Tourist attractions within the region are plenty including the natural attractions of the Kerio and Suguta valleys, a diversity of wildlife, water bodies (such as Lake Turkana which is the largest desert lake in the world), rich cultures, cultural museums, hot geysers, and heritages (such the cradle of mankind and the Marakwet furrows). Insecurity, poor infrastructure and poor marketing of tourism opportunities offered by the region largely affect this sector.

Infrastructure facilities are part of the structuring elements for integration in any region, since they are enablers of any development. The KVDA region has a total of 13,223 km of road with only 1,265km being tarmacked. Samburu county is the worst affected, with none of the county roads being tarmacked. There is only one Class A1 road running (Kitale-Makutano-Lodwar-Lokichogio-Nadapal-Juba (Southern Sudan). This international highway is in poor shape with large sections being un-tarmacked, the narrowness as compared to standard design of highways as well lack of proper drainage systems and bridges. Overall, the KVDA region is characterized by a poor state of road infrastructure that is largely undeveloped in large portions of the region resulting in insecurity and low economic development.

Air transport in the Kerio Valley region is presently used for business, tourism, and medical evacuation as well for security purposes. Turkana County has several airstrips with two of these (Lodwar and Lokichogio) frequently used, because the area has good terrain and conducive weather for air travel. Airstrips in the other counties are under frequent use with most of them being just aerodromes. There is difficulty in building airstrips in the southern part of the region because of the rugged terrain and high elevation around Cherangani and Tugen Hills, coupled with the difficulty of flying in these areas because of bad weather, especially during the rainy season. There are also unlicensed aerodromes within the region that one needs permission to use. Only the southern tip of the Kerio Valley region is presently accessible to railway lines. The Uganda Railroad passes through the southern portion of Elgeyo Marakwet County with a length of 40km and one railway station. There is also an underutilized branch line from Rongai to Solai via Kambi ya Moto. There was a proposal of a 238km railway to be built (from Kambi-Ya-Moto in Nakuru to Wei Wei Camp via Tenges and Kimwarer in West Pokot with 17 stations) that was never implemented because of lack of funds. While water transport is mainly used, the potential for it has not been fully tapped in the region.

The main source of energy currently being used by people in KVDA region is wood fuel for cooking. Only 5% of people have access to electricity, and mainly only in urban centres, despite the presence of Turkwel Gorge power station in the region. This power station, which was constructed under KVDA 1986 to 1991, produces 106 MW of power. There is large untapped potential for solar, wind, geothermal, biomass and hydropower energy in the region.

Water and sanitation is a major problem within the KVDA region. Surface water is used mainly in the southern parts (Elgeyo Marakwet, parts of West Pokot and Baringo counties) as the northern parts have few seasonal rivers, which are difficult to access. As a result, the most common sources of water in Turkana and Samburu counties are boreholes and shallow wells. The challenge posed by these water sources, is that the water is not always clean/safe for drinking. On average, 57% of the people in the whole of KVDA region use the surrounding bushes as a mode of human waste disposal while 40% have pit latrines.

There is poor mobile network coverage in Turkana and Samburu counties while Elgeyo Marakwet and Baringo counties have relatively better network coverage. Many households have access to radio devices because of its use of batteries, which can easily be bought. There are also a rising number of people owning mobile phones, especially among the youths. Most of the people in the Northern part of the KVDA region cannot easily access print media, which they receive a day late because of the inaccessibility of the region. The Southern part has better access to print media because of good transport networks, and its proximity to towns such as Kitale, Eldoret and Nakuru. Currently, there are no fiber optic cables passing within the whole of KVDA region; but there are plans for a line running from Leseru-Kitale-Makutano-Lodwar-Lokichogio.

There are different spatial patterns of human settlements in all the counties within Kerio Valley, as well as diverse housing typologies. Major structuring elements of human settlements within the region are transport corridors; physical features (such as escarpments, valley floors, rivers and lakes) and resources points like pasture lands and water points. Thus as a result, the settlement patterns in the region are mainly cluster settlements around resource zones and major urban centres, linear settlements like Lodwar and Lokichar along the A1 road and scattered settlements in the valley bottoms and hilltops of Elgeyo Marakwet.

It is expected that the major drivers of growth and urbanization in the region will be determined by transition to county governments, the proposed LAPSSET corridor and also new discoveries, (such as; limestone in Ortum and oil in Turkana) that will open up massive investment opportunities within the region. Housing typologies in
the region generally dwell on indigenous knowledge with building materials mostly made of mud, dried grass wood, stone and iron sheets. Most of the formal housing is found in the urban centres of Baringo, West Pokot and Elgeyo Marakwet. While the counties of Turkana and Samburu have more traditional structures of manyattas. However, towards the Northern parts of the region there is a housing shortage as majority of the formal housing structures are government owned structures, which are also inadequate in number.

The most common land tenure system in the area is communal land held in trust by the county councils on behalf of the community, in Turkana, Samburu, the Northern region of Baringo County and the Northern areas of West Pokot. Consequently, there is minimal allocation of title deeds and vast undeveloped tracts of land. In Samburu County, there exist pockets of group ranches and communal land ownership. Private land ownership is only found in Elgeyo Marakwet County, parts of Baringo County and Southern portions of West Pokot County. Both population densities and development are higher in areas with individual land ownership as opposed to areas with communal land tenure systems.

In light of the various challenges that face the KVDA region, such as; conflict, low human resource development, poor infrastructure, environmental degradation, amongst others, the IRDMP sought to provide integrated solutions for these problems. This strategy formulation process was informed by the diagnosis of the existing situation, the Consultant’s experience and stakeholder inputs gathered throughout the process. The main input was the data collected at the five county forums held, where the key stakeholders validated the diagnosis presented and gave feedback. It is from these interactions with stakeholders, the vision for this IRDMP was coined as “Integrated Planning for Sustainable Resource Utilization, Socio-cultural, Political and Economic Development in Realization of Vision 2030.”

The strategies for turning round the region include: environmental conservation, economy, infrastructure, quality of life, branding, security, governance and implementation frameworks, anchored upon the following main development models:

a) Branding:

The KVDA region is rich in resources, which have not been mapped and marketed to investors. The region has also been a victim of negative perceptions of conflict-prone region in the country. It is proposed therefore important to rebrand the region be as “An Engine to Economic Empowerment in the North Rift”. The five counties should also be branded according to their respective strengths and opportunities that they present and can be marketed to advertise their respective investment niche. The counties have been branded as follows: Baringo County “Tourism and Green Energy County”, Turkana County “Industrial (Oil), Livestock cum Tourism County”, Elgeyo Marakwet “Agricultural cum Sports Tourism County”, Samburu County “Tourism cum Livestock Farming County” and West Pokot County “Mineral Exploration cum Agriculture County”.

b) Economic Development Model:

The economic development model has the following sub models: agriculture development, livestock development, industrial development, enterprise development and tourism development. Each of the models aims to maximize the value chain at every stage from production to marketing to the final sale. The agriculture development model aims to: improve farming methods, improve the food security situation, improve the access to inputs, promote the farming of untapped crops such as sisal, cotton and pyrethrum, promotion and establishment of marketing channels and increase access to market information among others. For the purposes of monitoring and evaluation, the expected indicators are: Improved food security, improved incomes from agriculture, improved borrowing culture, increased input usage, increased knowledge and use of better technology and adaptation of cotton, sisal and pyrethrum. The strategies are implemented from short term to the long term.

c) Infrastructure Development Model:

The strategy for transport is to enable people, goods and services to reach their destination safely, economically and quickly and to improve access to services in the rural parts of the KVDA region. This will be realized by implementing transport projects identified such as upgrading all classes of roads according to acceptable standards, opening more access roads and implementing the LAPSET project.

The energy strategy, aims at improving access to electricity in all centres and other alternative energy sources for cooking and lighting in rural areas through promoting the use of improved (energy-saving) jikos that utilize the use of wood fuel (charcoal) as well as encouraging planting of trees; providing initiatives for solar installation and use of in rural areas and the use of biogas in public institutions such as secondary schools. Exploring solar energy potential to feed the output into the existing transmission line from Turkwel Gorge; rural electrification to all market and local centres; enhancement of Public Private Partnerships for construction of geothermal power plants potentials, HEP plants in identified rivers and Biomass fuel power plants for mathenge, are all other energy development proposals made.
Water development strategy is to develop, protect, improve and extend water supply and their sources by enhancing water harvesting at household level for domestic use; exploiting ground water sources; conservation of water catchment areas; construction of dams/ sand dams/weir for surface water runoff and seeking donor funding for construction of dams identified as potential water supply sources, etc.

ICT strategies seek to ensure regional interconnection and development of added value services and to develop a globally competitive industry as a foundation of a knowledge economy. Counties can actually lobby the CCK to bring ICT projects, which include school based ICT centres, Community-Tele centres, ICT for people with Disabilities, into their counties under the Universal Service Fund, established by an Act of Parliament [The Kenya Communications - Amendment Act 2009].

d) Spatial Structure Development Model:

The spatial development model is mainly centred on settlement development interventions. Its main sub-models are urban development strategy, rural development strategy and the growth pole strategy. The establishment of integrated local spatial development plans for all county headquarters (urban areas), provision of adequate education, health, recreation and other requisite services at all county headquarters, potential towns (industrial towns, LAPSET centres) which will spur growth of these economic hubs, improving the competitiveness of the agricultural and forestry sector and improving the environment through increased irrigation activities in rural areas; advocating for clustered/agglomeration of settlement for ease of service provision within the KVDA region to improve the spatial and environmental quality of both rural and urban areas. Growth poles [such as Iten, Lodwar, Makutano, Mararal, Kabarnet, Lokichar, Ortum, among others] to exploit available resources with inter linkages with each other to create competitive growth corridors have been designated.

e) Natural Resources & Green Growth Development Model:

KVDA’s area of jurisdiction is richly endowed with a variety of natural resources such as water, wildlife, minerals, and forests, among others. With growing population putting pressure on these resources coupled with climate change challenges, a model addressing environmental conservation is crucial. Climate change adaptation can be achieved through conservation agriculture, introducing more drought resistant crops and traditional crops, and having a link between meteorological information and agricultural practices to facilitate early preparation against disasters and diversifying livelihoods. Land use planning by outlining specific uses of land in every county in terms of provision of services and infrastructure, production and industrial areas, settlements, demarcation of land banks for future use, among others can go a long way towards optimal land utilization that promotes efficient productivity and development.

Encouraging ranching as opposed to nomadism is proposed to enhance maximum land utilization. Managing trans-boundary movement of people and livestock by border patrolling to curb movement of illegal immigrants, refugees and proliferation of arms is aimed at bringing lasting peace between warring communities, while minimizing cases of foreign pests and diseases. The IRDMP proposes conservation of the main water towers through afforestation, access restrictions, and enforcement of NEMA riparian and forest buffer zones of 30m. It is also looking to partner with the Kenya Forest Service to control and regulate licensing of fuel wood collection, livestock grazing, developing and maintaining a well updated database system on the forest ecosystem and local livelihood and establishing a feedback mechanism and information sharing system.

Green growth is a concept that recognizes that environmental protection is a driver of global and national economic development. This can be achieved through various ways such as implementing of green projects eligible for carbon credits such as renewable energy projects (wind, solar and geothermal), afforestation and re-afforestation projects and switching to energy-efficiency improvement measures,

f) Social Development Model:

The KVDA region is characterized by various human resource development challenges such as high illiteracy levels, high poverty levels, and gender inequalities, amongst others. This has created a gap in developing skills, necessary for success of the implementation of this IRDMP. With the shift towards stakeholder participation in development initiatives, it is more crucial to enhance the quality level of participation through ensuring literacy of all residents, poverty reduction and fostering gender equity to enhance people’s ability to participate in decision-making.

The detailed strategies and programmes within the social development model towards poverty alleviation and gender equity are mainly categorized into strategic areas; To ensure access to basic infrastructural services and social amenities like health and education facilities, to ensure food security for both the rural and urban poor, to guarantee community empowerment on running projects that supplement income generation, to enhance human resource development, to reduce and eventually eradicate insecurity in the region and mainstream gender and cul-
tural issues economically and socially through tapping into the cultural base of the region.

**g) Flagship Projects:**

Flagship projects are large-scale projects that are developed with the intention of fostering large-scale gains over a big area, and for a large number of people. The IRDMP proposes the following flagship projects, which can boost the region economically through larger multiplier effects:

- Regional peace-building conservancies and irrigation projects which will be located on inter-county and international boundaries.
- Agro-villages to optimize the value chains within key agricultural strongholds in Tot in Elgeyo Marakwet, Todonyang in Turkana and expansion of Pekerra Irrigation Scheme in Baringo
- Livestock improvement villages in Samburu, Turkana and West Pokot counties to optimize and diversify livestock products, while encouraging farm tourism.
- Conservation Projects such as soil conservation in Baringo County and forest conservation (Cherangany Forest in Elgeyo Marakwet – West Pokot Counties and Kirisia Forest in Samburu County), which aims to conserve forests as water towers.
- Special Economic Zone (in Lokichar Turkana County and Ortum, West Pokot County) to take advantage of the existing resources in the region and proposed transport infrastructure.
- Bio-extraction and value-addition of herbal plants (such as Aloe Vera, Sisal and Jatropha in Samburu, Turkana, West Pokot and Baringo Counties to optimize their value chains.
- A stadium complex in Iten, Elgeyo Marakwet County that will nurture and tap the athletic potential of both the locals and their international counter parts while entrenching sports tourism into the county economy.

**h) Institutional Reform & Implementation Model:**

KVDA as the implementing agent and the driver of economic growth in the region requires institutional reform geared to have transparent and accountable governance, political goodwill to support development, reduced bureaucratic red tape and increased public participation in decision making. In order to achieve this, KVDA is proposed to be a leaner, efficient, re-branded KVDA responsive to the needs of the region with its redefined roles that includes: resource centre/ knowledge hub, advocacy for resource conservation & protection, capacity building for the counties & communities, catalysing conflict-resolution/peace processes, advising counties on implementation of natural resource utilization issues, regional marketing and branding (investment conferences, study tours) and a vehicle for bargaining for resource mobilization for region.

An integrated strategy built on framework of stakeholders and partnership that informs all the various stakeholders on a regular basis for communication, participation and partnership will ensure success of the IRDMP. In order to involve relevant expertise for plan implementation at all levels, it is also important to facilitate extensive participation by all stakeholders. As a first step, capacity building will be implemented through KVDA and the proposed Coordination Unit but as the implementation progresses; the type of capacity to be developed will be relevant for the entire region. Monitoring mechanisms for intended results could include periodic reviews by the parties involved in the IRDMP implementation, (such as KVDA, donors, County Governments and target community) covering the mobilization of resource inputs, financial management, and overall progress towards delivery of outputs. Regular meetings, capacity building and improved communication should further reduce implementation delays, conflicts, suspicion and mistrust among key stakeholders. The IRDMP proposes the setting up and development of two tier management teams and standing committees, as outlined below:

- The Management Team: comprising the Managing Director of KVDA, County Governors and specialized unit heads at both the KVDA and County government levels. This is primarily responsible for strategies review and development, resource mobilization, monitoring and evaluations.
- The County Team: comprising heads of departments and section heads. The team will be meeting frequently to discuss departamental plans implementation tasks and strategies and its deliberations into the management team meetings
- Inter Counties Standing Committees: to handle specific crosscutting issues.
CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO THE STUDY:

1.1.1 Overview:

The Government of Kenya, in recognizing the regional disparities in the country, and the uniqueness of various regions, created Regional Development Authorities (RDAs). These RDAs were established based on river basins and large water masses to reverse disparities in development of different regions by complementing the work of line ministries through planning, developing and implementing multi-sectoral and coordinated development programmes and projects.

In this context, six RDA’s were established including Kerio Valley Development Authority, Lake Basin Development Authority, Ewaso Nyiro North Development Authority, Ewaso Nyiro South Regional Authority, Tana, Athi River Development Authority and Coast Development Authority. The Ministry of Regional Development Authorities (MORDA) was established in 2003 to provide policy guidance, enhance capacity building, management oversight and support to RDA’s.

Kerio Valley Development Authority (KVDA), established in 1979 through CAP 441 Laws of Kenya, was tasked with the promotion of integrated development within its area of operation. The Authority is mandated to identify, plan, coordinate and implement projects that enhance communities’ incomes, promote environmental conservation and socio-economic development. The Authority also seeks to align its development agenda to the national one guided by the Vision 2030 aims of creating a globally competitive and prosperous nation with high quality of life for all citizens by 2030. In light of this, Kerio Valley Development Authority (KVDA) mandated Two Ems Associates Limited to prepare an Integrated Regional Development Master Plan (IRDMP) for the area under its jurisdiction.

This Situational Diagnostic Report is the second deliverable of the IRDMP study, and its purpose is to analyse the existing situation within the study area, a diagnosis that will form the backbone of the plan preparation stage for the IRDMP. This report has been structured into 7 chapters as outlined below:

- CHAPTER 1: INTRODUCTION (Background to Study, Contextualization, Scope of Study, Methodology, Implementation of Previous IRDMP)
- CHAPTER 2: PLANNING CONTEXT: POLICY AND INSTITUTIONAL FRAMEWORK (Needs Assessment Summary)
- CHAPTER 3: NATURAL RESOURCE STRUCTURE
- CHAPTER 4: POPULATION AND DEMOGRAPHIC CHARACTERISTICS
- CHAPTER 5: CULTURE, GENDER AND CONFLICT
- CHAPTER 6: ECONOMIC STRUCTURE
- CHAPTER 7: HUMAN SETTLEMENTS, LAND USE AND TENURE SYSTEMS
- CHAPTER 8: INFRASTRUCTURE SERVICES AND UTILITIES
- CHAPTER 9: GROWTH CORRIDOR CHARACTERISTICS
- CHAPTER 10: SUMMARY OF EMERGING ISSUES

1.1.2 Delineation of the Study Area

The Terms of Reference delineated the area of study as “the districts of Baringo Central, Marigat, North Baringo, Koibatek, Mogotio, Keiyo South, Keiyo North, Marakwet West, Marakwet East, West Pokot, Central Pokot, East Pokot, North Pokot, Turkana Central, Turkana North, Turkana South, Turkana East, Turkana West, Loima, Samburu West and Samburu Central.” This delineation however posed a challenge because by June 2009, there were 254 districts in Kenya. However, a High Court ruling in August 2009 declared all districts created after 1992 illegal.

These delineation challenges were further compounded by the lack of actual physical structures for most of the districts created after 2009. Collection of accurate/reliable data for districts created after 2009 was also restricted by the fact that they were not captured as the 2009 census was being conducted. It is also important to note that in light of the new constitutional dispensation, devolution is moving governance away to county governance, as opposed to the district structures. Consequently, it was important for data collection to be designed in a way that...
data collected would be both accurate and relevant to the implementing authorities. In summary therefore, through a combined study of the districts created by the government to date, the presence of district headquarters, their recognition in the Kenya Population Census (2009), and the delineation of counties in the new Constitution, the area of coverage for this study is summarized as:

Table 1: Counties and Districts within Kerio Valley

<table>
<thead>
<tr>
<th>COUNTY/DISTRICT</th>
<th>POPULATION</th>
<th>AREA (Km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turkana County</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkana North</td>
<td>151,298</td>
<td>18,153.00</td>
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<tr>
<td>Turkana West</td>
<td>186,604</td>
<td>14,402.80</td>
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<td>Turkana Central</td>
<td>133,126</td>
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<td>Loima</td>
<td>157,992</td>
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<td>Turkana South</td>
<td>112,404</td>
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<td>Turkana East</td>
<td>113,975</td>
<td>17,723.70</td>
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<tr>
<td><strong>West Pokot County</strong></td>
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<tr>
<td>West Pokot</td>
<td>109,584</td>
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<td>Pokot Central</td>
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<td>Pokot South</td>
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<td><strong>Baringo County</strong></td>
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<tr>
<td>Baringo East</td>
<td>133,189</td>
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<td>Baringo North</td>
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<td>Mogotio</td>
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<td>Eldama Ravine</td>
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<td><strong>Elgeyo Marakwet County</strong></td>
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<tr>
<td>Marakwet East</td>
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<td>Keiyo North</td>
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<td>Keiyo South</td>
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<tr>
<td><strong>Parts of Samburu County</strong></td>
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<tr>
<td>Samburu Central</td>
<td>105,052</td>
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<td>Samburu North</td>
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<td><strong>Parts of Nakuru County</strong></td>
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<tr>
<td>Molo</td>
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<td>Kuresoi South</td>
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<td>Rongai</td>
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<td><strong>Area Coverage</strong></td>
<td>2,952,556</td>
<td>107,759.18 km²</td>
</tr>
</tbody>
</table>

1.1.3 Benchmarking Case Studies: River Basin Master Planning

Benchmarking case studies is an important aspect of any study as it provides an overview of similar situations that have either previously succeeded or failed. In the foregoing sections Senegal River Basin Master Plan has been analysed as a case study to inform the preparation process of integrated river basins regional plans and highlighting the lessons learnt. A case study of a Tennessee Valley Authority provides good highlights on how KVDA can achieve its goals of development promotion. The case study of Malaysia has been provided to give a picture of why Regional Development Authorities failed.

The case studies selected therefore have been detailed in the following order:
- Senegal River Basin Master Plan
- Tennessee Valley Authority (USA)
- Malaysia Regional Development Authorities

a). Senegal River Basin Water & Environmental Management Project

**Justification for Selection:**

Senegal River Basin has been selected as an appropriate case study for various reasons:

- Physiographic Characteristics- The region has both characteristics of rainy uplands and arid low lands a scenario similar to that in Kerio Valley.
- Food Security Challenges- The region has faced a cycle of problems of severe droughts and unstable food security, also similar to large sections of Kerio Valley.
- Conflicts- Senegal river basin is faced with the challenges of a traditionally fragmented society with conflicts among ethnic groups similar to those in Kerio Valley.
- Over-reliance on Pastoralism- Similar to the situation in the arid portions of Kerio Valley, there is a difficulty in changing to alternative livelihoods.
- Other similarities with the area of study include high poverty levels and low economic development, mainly attributed to policy-related issues.
- Presence of Large-Scale Schemes- The region has also been the base for several large-scale schemes of irrigation and hydropower generation, but has not had much success on improving the livelihoods of people. This is a scenario replicated by facilities such as Turkwell Dam among others in Kerio Valley.
- Poor Implementation of the Previous Plan- The previous Senegal River Basin Master Plan (1994) was not implemented with a myriad of consequent projects not taking into account its objectives or contradicting them altogether. This scenario is replicated in Kerio Valley where the previous Master Plan was largely unimplemented.¹

**Area Covered:**
The Senegal River, the second longest river in West Africa, flows for 1,800 km extending across four riparian countries (from Guinea through Mali and Mauritania to Senegal) making it an international river basin covering 300,000 km².

¹Olli Varis, Virpi Stucki & Sylvie Fraboulet-Jussila; The Senegal River Case; 2006; Finland
The Senegal River Basin has three distinct geographic regions; the Upper Basin (a mountainous area), the Valley (featuring a floodplain varying in width from 10 to 20 km) and the Delta. The River’s three principal tributaries each originate in the Fouta Djallon Mountains in Guinea and together produce more than 80% of the Senegal River’s flow.

**Challenges Facing River Basin:**
- Rural-urban migration
- Extreme poverty making people vulnerable to climate change
- Land conversion complications
  - Degradation of water quality and invasive species
  - Inconsistent and inefficient water management
  - Deforestation
Lessons Learnt:

Figure 1: Lessons Learnt from the Senegal River Basin Project

Key Interventions:

- Stakeholder engagement in river basin management
- Soil erosion control measures
- Agro-forestry
- Wetland management
- Water quality improvement methods
- Local capacity building

b). Tennessee Valley Authority (USA): Successful RDA Case Study

The Tennessee Valley Authority (TVA) in the United States of America has become a model agency in regional development planning and modernizing third-world agrarian societies since its establishment in 1933.²

Plate 2: Aerial Image of Tennessee Valley

Source: Google/ Tennessee-valley-authority-images [2012]

² http://en.wikipedia.org/wiki/Tennessee_Valley_Authority
Prior to its establishment, Tennessee Valley was suffering from low farm incomes, disease, erosion, and deforestation, among other challenges. In response, TVA was established as “a corporation clothed with the power of the government but possessing the flexibility and initiative of a private enterprise”. To address these challenges, TVA adopted the Integrated Resource Management Approach, where problems were analysed and solutions formulated in relation to the whole picture. Dams for instance were built to harness the region’s rivers, produce electricity, control floods and improve navigation. This in turn attracted industrial investors into the region, resulting in job creation.3

Today, TVA has a system of nine dams along the river’s 652 miles. The Authority has now diversified from purely hydro-electricity into a variety of energy-generating methods such as wind, solar, waste-derived methane and nuclear energy as illustrated below:

Plate 3: Wind, Nuclear, Solar and Hydropower Projects Undertaken by TVA

Success Factors:

- Internal Funding: Prior to 1959, TVA received funding from the government. However, the Authority has since transformed into a fully self-financing body through its own revenue-generation systems.
- Diversification: TVA has diversified over the years to different and cleaner renewable sources of energy, responding to the increasing demand within the market and hence further boosting its revenue. The authority for instance earned revenue of approximately 11.26 Billion USD in 2009.

3 www.tva.org
c. Malaysia: Failure of Regional Development Authorities

Identification of resource frontier regions of Malaysia was developed as a means of tackling uneven development so as to achieve a balance between the rural regions and the large conurbations such as Kuala Lumpur. A number of development centres were identified for establishment within resource frontier regions and in turn, several statutory Regional Development Authorities were formed to implement the development strategy in these regions. Apart from the main goal of eradicating poverty and restructuring of society, the mandates given to the RDA’s included:

- Redress economic and structural imbalances between regions
- Utilize resource strengths of less developed areas towards national economic development
- Strengthen agricultural and industrial development in lagging regions
- Redirect new developmental growth to less developed regions
- Urbanize rural agriculture regions by the development of towns in the rural areas

The development of frontier regions in the 1970’s was successful in opening up land for agriculture and few agro-based industries which were lead by the government corporations. However, the strategy to disperse industrial development through rural urbanization programs failed to attract private investments and to foster the development of entrepreneurs among the indigenous people of the region.

Failure Factors:
While the regional development authorities in Malaysia were not river basin based, they provide good lessons, which led to their failure, factors that should be avoided in this study. The RDAs failed for various reasons:

- Vastness of areas covered- The area covered by the regional corridors was too big and the sectors of focus too broad. It is therefore impossible to implement development covering the whole area given the limited resources available.
- Lack of spatial focus
- Private driven development- This limited the scope for government to intervene to ensure equitable distribution of benefit.
- Poor extra-institutional coordination- Political differences between state and federal government and between states in regions made coordination difficult, in particular the states, which were ruled by a different party from the federal government.
- Government resource constraints
- Too much dependency on big capital including foreign investors to generate growth. There was a lack of emphasis on the development of local resources including small business developments and enhancing community empowerment

d). Summary of Lessons Learnt From Case Studies

Best Practices worldwide have based development & implementation of Integrated Regional Development Plans on 5 pillars:

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^Ouazi, (1987:4)
One of the critical success factors in the plans has been focus on local communities and their resources in both plan formulation and the strategies developed. A summary of the community success factors has been illustrated below:

In conclusion, all forms of development interventions must be evaluated so as to determine their merit/worth. There are five criteria’s that are important in assessing the development of interventions:
Figure 4: Intervention Evaluation Criteria

Adapted from SIDA, 2004

1.2 CONTEXTUALIZATION

1.2.1 Overview

Most of the world’s land surface, apart from the most arid and cold areas, is divisible into drainage basins (Dasmann et al., 1973; Saha and Barrow, 1981). If too large for planning and management, basins can be divided into sections using hydrological and catchment characteristics (e.g., upper, middle and lower basin) or sub-basins by tributaries.

Although there are some processes or activities that cross the boundary, basins are bio-geo-physical units with a high degree of functional integrity, and are relatively homogeneous systems, even when upper, middle and lower sections have different conditions and human activities. Each basin is unique, but there is enough commonality of hydrological, geomorphological and ecological characteristics for them to serve as widely applicable, non-ephemeral, operational landscape units for planning and management and for maintaining environmental quality and pursuit of sustainable development (White, 1963; ECE, 1971; O’Sullivan, 1979).

Regional Development Authorities (RDA) was formed on the above basis. KVDA region is part of the wider Lake Turkana Basin which covers three countries (Kenya, Ethiopia and Uganda) and Lotikipi Plains Basin which covers four countries (Kenya, Uganda, Ethiopia and Sudan).

Lake Turkana Basin
The Basin covers 209,157 km² (WRI 2002)
Includes the following lakes:
- Lake Abaya Hayk’ (Ethiopia)
- Lake Ch’amo Hayk’, (Ethiopia)
- Lake Ch’ew Bahir (Ethiopia)
- Lake Turkana (Kenya)
- Lake Baringo (Kenya)
- Lake Bogoria (Kenya)
- Lake Logipi (Kenya)

Major rivers
- Kerio River
- Turkwell River
- Omo River

Lotikipi plains Basin
The wetland is 120 km long, 85 km of which extends into Kenya. At its widest northern end, it is 125 km wide. Major rivers includes:
- Tarach River
- Narengor River

They drain into Lotikipi swamp.
Kenya can be divided into 6 distinct Drainage basins and it’s on this basis that regional development authorities were born. The six Authorities include:

- Kerio Valley Development Authority: Bounded by Lake Turkana and Lotikipi Basins (Kerio river, Turkwell river, Lake Baringo and Bogoria, Lake Turkana and Tarach River)
- Tana Athi River Development Authority: bounded by and drained by the Tana and Athi Rivers catchments.
- Lake Basin Development Authority: Bounded by Lake Victoria.
- Ewaso Nyiro North Development Authority: bounded by Ewaso Ng’iro North River Catchment [Part of the wider Juba-Shebelle Basin]
- Ewaso Nyiro South Development Authority : bounded by Ewaso Ng’iro South River Catchment
- Coast Development Authority: Bounded by coastal hinterland.
KVDA’s area of jurisdiction is the part covered by the two basins (Lake Turkana and Lotikipi Plains) within the Kenyan boundaries. Since the area is too wide for effective administration and management, it can be broken down into six catchment areas. These include:

1. Lake Turkana Catchment
2. Lakes Baringo- Bogoria Catchment
3. Suam/Turkwell Catchment
4. Kerio River Catchment
5. Suguta/ L. Lotikipi Catchment
6. Tarach/Lotikipi Catchment
KVDA IN THE LOCAL CONTEXT (DRAINAGE CATCHMENTS)

Catchments Coverage as proportional of KVDA region.

- Baringo-Bogoria 5%
- Omo River 0%
- Kerio River 15%
- Turkwell River 26%
- Turkana Lake
- Suguta River 13%
- Tarach River 23%
- Turkwel River 26%
- Lake Turkana

Legend:
- Catchments
- Rivers
- Lakes and Wetlands
- Forests
- Study Area

located in the North Western part of Kenya within the wider former rift valley province. It’s operational area Covers the following administrative and political boundaries:

- Baringo County (Tiaty, Baringo North, Baringo Central, Baringo South, Mogotio Eldama Ravine Constituencies)
- Elgeyo-Marakwet County (Marakwet East, Marakwet West, Keiyo North, Keiyo South Constituencies)
- West Pokot County (Kapenguria, Sigor Pokot South, Kacheliba Constituencies)
- Turkana County (Loima, Turkana North, Turkana Central, Turkana West, Turkana East Constituencies)
- Parts of Samburu County (Samburu North and Samburu Central Constituencies)
- Parts of Nakuru County (Kuresoi -South and North, Rongai and Molo Constituencies)

Map: KVDA Administrative Context

KVDA’s area of jurisdiction is located in the North Western part of Kenya, covering approximately 107,759.18 km², which represents 19% of the national landmass. The arid and semi-arid lands within Kerio Valley form nearly a third (21.5%) of all of Kenya’s ASAL’s.
1.2.2 Structuring Elements of KVDA

The authority coined its name from the distinct and impressive Kerio Valley Basin which lies between the Elgeyo and Laikipia escarpments within the greater Rift Valley. It lies at an elevation of about 1,000 m in Northern Rift Valley. Many rivers and lakes are found in this valley since it forms a distinct drainage basin. It has semi-tropical vegetation on the slopes, while the floor of the valley is covered by dry thorn bushes. The valley stretches up to Lake Turkana.
1.2.3 Common Water Related Problems in River Based Basins

- Abstraction rates and amount of water taken from the environment for human use lead to low river flows and depleted groundwater levels
- Invasive alien species
- Diffuse pollution comes from multiple sources including agriculture, urban areas and transport systems
- Pollution originating from a single point source such as a sewage treatment works.
- The impact of physical modification on water bodies, such as flood defences and damming
- Soil erosion and degradation

a) Institutional Crisis
A key issue is the lack of awareness of the cross-sectored nature of water problems and the need for a new development paradigm towards integrating the technical, economic, environmental, social and legal aspects of water management. The development of administrative units in water resource management has to coincide with the river basins’ boundaries instead of political boundaries. The lack, or inadequacy, of water legislation and policies is a stumbling block to integrated management of the river basin and optimal use of water resources.

b) Trans-Boundary Issues
KVDA region shares boundaries with three other countries namely South Sudan, Uganda and Ethiopia; moreover the two basins in the region are trans-boundary. Other issues include:

- Trans-boundary water resources; (OMO Delta, Suam River etc.)
- Trans-boundary movement of people; (free movement of the pastoral communities between the three countries)
- Trans-boundary movement of pests and disease
There are no specific laws governing the use of Lake Turkana or its river waters. Major political and management concerns in the Basin include insecurity because of conflicts within the bordering countries including ethnic conflicts over grazing grounds, chronic water scarcity, and drought-related food insecurity.

The Lotikipi Plains region is hardly utilized by people except for some hunting and grazing; it has no protected status (UNDP 2006).

Currently the four countries lack a shared vision to manage the trans-boundary issues resulting into fragmented management practices. Cooperative environmental management and policy making to address issues of mutual concern are complicated, since laws and regulations usually differ on either side of the border and there are many institutional players with different agendas and mandates.

The understanding and management of scales in watershed and river basin management is a challenge. When embedding watershed management into river basin management it is important to understand the differences in scale and the implications this has for management. There is a need to re-think scale of intervention, upstream-downstream linkages, temporal and spatial processes, bio-physical and socio-economic linkages, and political issues. Extrapolation and up-scaling from watershed to sub-basin or basin scale can have negative consequences if the effects of scale are not well understood (FAO, 2007).

C) Managing Watersheds and River Basins: Top-Down, Bottom-Up, or Both?
The Global Water Partnership (GWP) defines IWRM (Integrated Water Resource Management) as a “process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP 2000). While this definition has a sound theoretical basis, practical implementation of the ideal IWRM scenario presents many challenges, such as: how to think at the basin level and act locally, and what is needed to ensure that water resources management is mainstreamed in economies? IWRM is enshrined in law in many countries but how can rhetoric be turned into good practice?

1.2.4. Guidelines Relating to Integrated Basin Management

- Identify the key barriers to integrated river basin management and promotion of land and water use planning/management within a river basin and work to overcome them.
- Develop consultative processes which involve the various sectors and institutions responsible for water management, environmental protection and agriculture (at least) and a basin-wide plan for the conservation, utilisation and management of the water resources.
- Integrate wetland conservation into river basin management to benefit management goals, such as water supply, flood management, pollution mitigation and the conservation of biological diversity.
- Promote the protection and restoration of wetland areas, and their biodiversity, within river basins.
- Develop appropriate and socially acceptable cost-sharing mechanisms to cover costs involved in the management of river basins.
1.2.5 Summary of Issues in KVDA Region

THE ILEMII TRIANGLE
Area of International Territorial dispute between Kenya and Southern Sudan

CROSS BORDER CONFLICTS

KVDA REGION:
REGIONAL GEOGRAPHICAL CONTEXT

REGIONAL CONTEXT
KVDA is located to the North West of Kenya and it Neighbours Uganda to the West, Southern Sudan and Ethiopia to the North. Its Geographic location places KVDAs location on land Categorized as Arid and Semi Arid with Pastrolism is the main livelihood of the majority of the communities living in the region.

THE ILEMII TRIANGLE CONFLICT
It measures between 10,320 and 14,000 sq. km. Ilemii territory is claimed by Kenya and Southern Sudan. This has resulted to international conflict between the two countries. At the moment, Kenya is the de facto owner of the disputed land.

CROSS BORDER CONFLICTS
Along the Kenya-Uganda Border, Occasional Raids by Communities in Uganda(Karamajong) and Kenya (Turkana&Pokot) while along the Kenya-Ethiopia Border, raids by communities in Ethiopia(Merille) and Kenya(Turkana). Along the Kenya Southern Sudan Border, there exists raids between the Topasa of S. Sudan and Turkana of Kenya Exists. These Raids have resulted to high levels of insecurity along the International Borders.
1.3 METHODOLOGY ADOPTED FOR THE STUDY:

1.3.1 Scope of Study:

Geographically, this study has covered the entire catchment area of the Kerio Valley Basin in Kenya. The study has also extended its scope to the year 2033 in conformity with the national objective of agro-industrial transformation and value addition as a springboard to development as envisaged in Vision 2030, the new (2007) RDA policy paper and the Millennium Development Goals (MDGs), the ERS, PRSP, and other various sessional and policy papers. The scope of the study has been summarized in the figure below:

Figure 5: Scope of the IRDMP for Kerio Valley Region
1.3.2 Data Collection Process:

In development of the methodology for situational diagnosis of Kerio Valley, it was deemed important to examine the in-depth scale of planning and the unique context within which the process will be carried out. The Kerio Valley IRDMP covers a very large area (approximately 107,759.18 km²), which is a unique region delineated by a natural resource (river drainage basin), covering more than 1 district/local authority. The fundamental reason for regional planning is to control regional resources where a Regional Development Plan can be defined as a long-term plan, which provides a framework for development of a region for about 30 years, in conformity with national goals, policies and strategies. The management of a single resource may be a simple affair but becomes exceedingly complex when economic, political and social considerations come into play. Integrated Regional Development Planning refers to a multi-sectoral, multi-disciplinary process through which sustainable programs and projects can be prepared for the specific sub-national area. Sustainability requires dynamic stability achieved through change that is economically sound, socially just, environmentally friendly and that maintains the natural resource base.

Regional planning therefore requires assimilation of massive amounts of information (both quantitative and qualitative). Changing public values have also drawn attention to the effects of any development on the rest of the community. For these reasons a variety of data collection methods were adopted for a comprehensive coverage of the study area, which can be broadly classified into:

- Literature Review
- Reconnaissance Surveys
- GIS Mapping Component
- Field Surveys:
  - Administration of Household Questionnaires
  - Key Informant Interviews
- Stakeholder Participation

a). Literature Review:
Literature Review was the first data collection method used for purposes of familiarization of the scope and characteristics of the area under study. This stage involved the perusal through relevant pieces of literature for various reasons:

- To provide a theoretical understanding of the integrated regional planning of river basins. Lessons drawn from this stage served as a guide to preparation of the methodology of this study.
- To collect secondary data already compiled on the counties within Kerio Valley Region. Secondary data collected formed the basis of shaping of data collection instruments and provided the foundation on which subsequent data compilation was done.

The sources of secondary data reviewed were as diverse as the scope of this study itself. They included Kenya Population Census (2009), District Development Plans, Policy/Legislative Documents, Independent Reports and Reviews of the study area, Previous Regional Development Plans and Internet sources. Libraries of particular mention which included the KVDA Eldoret Library, Kenya Bureau of Statistics Library, United Nations Environmental Programme Library and the International Livestock and Research Institute Library, among others.

b). Reconnaissance Surveys:
Reconnaissance surveys are crucial for providing an understanding of an area that desk research cannot effectively offer. Reconnaissance surveys involve a brief visit to the study area that enables better structuring of data collection, visit itineraries and collection instruments. The entire planning team conducted the reconnaissance survey of the entire region over a period of two weeks.

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c) GIS Mapping Component:
The mapping component involved the use of topo-sheets, aerial photographs and satellite images to develop the base map of the study area. Ground-truthing of the same was done through actual field surveys of the area utilizing Ground Positioning Systems (GPS). The updated base map was then used to guide the consequent field survey stages and served as the canvass for the planning process.

The GIS platform complied as a result incorporates the following aspects:

- Natural resource inventories:
  - Contextualization and linkages within the RDA
  - Natural landscape and forms (mountains, ridges and plateaus)
  - Geological system (soils, rock types)
  - Drainage system (major and minor rivers, wetland areas)
  - Climatic zones
  - Rainfall distribution
  - Agro-ecological zones
  - Ground-water potential (high, medium, low ground water levels)
  - Mineral resources occurrence
  - Vegetation (bush land, forests)
  - Environmental concerns
- Demographic characteristics maps (population density)
- Human settlement pattern map
- Land use structure map
- Infrastructural facilities inventories:
  - Transportation map
  - Water points map
  - Agricultural zonation of crops and livestock
  - Tourism facilities, etc.

d) Field Surveys:

Administration of Questionnaires:
A total of 384 household questionnaires were administered within the area of study with 98% response using a sample frame of one questionnaire for every 7,873 households. The calculation of the number of questionnaires was based on a standard sample size calculation formula (Fisher et al, 1991) designed for large populations. In this formula, any population of more than ten thousand (10000) people is considered infinite. Thus, the formula below was adopted.

\[ n = \frac{(Z_{\alpha/2})^2 pq}{L^2} \]

Where
\[ n = \text{sample size} \]
\[ Z_{\alpha/2} = \text{Z-the value at the chosen confidence interval (for 95% confidence interval=1.96)} \]
\[ p = \text{estimated population with attributes of interest which} \]
\[ \text{If unknown we use} \]
\[ p = 0.5 \]
\[ q = 1-p \text{ and} \]
\[ L = \text{precision (chosen to be 0.05)} \]

\[ ^7 \text{R. A. Fisher and Francis Yates, 1939; L.H.C. Tippett, 1927; William G. Cochran, 1993} \]
For this study, sample size calculation was done using the following values:

\[ \begin{align*}
\mathbf{p} & = 0.5 \\
\mathbf{q} & = 0.5 \\
\mathbf{Z}_{\alpha/2} & = 1.96 \text{ for 95% CI} \\
\mathbf{L} & = 0.05
\end{align*} \]

Therefore, \[ n = \frac{(1.96)^2 (0.5 \times 0.5)}{(0.05)^2} = 384 \text{ questionnaires} \]

The advantage of using this formula was that it provided a scientifically acceptable sample size, which enabled the consultants to save on time, costs and speed especially due to the remote nature of the planning area. This also considerably reduced travel requirements.

The questionnaire administered to these households has been attached as Appendix A of this report. The counties covered in this study were: Turkana, Samburu, West Pokot, Elgeyo Marakwet and Baringo. In each of these counties, both the population and the number of households in each were considered (proportionate distribution), and the sample frame distributed as per the population as illustrated in the chart below:

**Chart: Questionnaires per County**

![Questionnaires per County Chart](chart.png)

Source: Author, 2012
These questionnaires were also distributed among the different catchment areas as shown below:

The questionnaires were distributed among various settlements that lie directly along the main transport corridors due to inaccessibility and insecurity concerns. Purposive emphasis was given to the main urban centre areas as they had denser population distribution as compared to their hinterland areas. Random sampling was then used to distribute the questionnaires in the various settlements ensuring a comprehensive survey of the area as illustrated below:

**Table: Questionnaires per Centre**

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Key Informant Interviews:
The final phase of data collection was the interviewing of key informants, which was done using purposive sampling methods.

At the Central Government level, visits were made to relevant ministries such as those of Regional Development, Energy, Planning and Vision 2030, Agriculture, among others. Others included parastatals such as KENGEN, KeNHA, KERRA, KAA, among others. At ground level offices visited included those of the Local Authorities, District Commissioners, District Officers, District Development Officers, District Peace Committees, District Livestock Officers, among others. Particular effort was made to interact with the KVDA regional managers and liaison officers on the ground during the data collection process. The data collection instruments used to guide interviews with these key informants have been attached as Appendix B of this report.

Plate 4: Planning Team Visiting the KVDA Suam Conservation Project Office

Plate 4: Planning Team Visiting the KVDA Suam Conservation Project Office

Stakeholder Participation:
Due to the large geographical area that Kerio Valley Region covers, the persons/bodies with vested interests are vast in number. Paradigm shifts in planning techniques have acknowledged that plans that are developed with disregard for stakeholder aspirations are unsustainable and hence fail. A participatory approach can be defined as one where everyone with a stake in the intervention has a voice either in person or by representation. For this reason, the need for participation of the community (citizenry), non-governmental organizations (local and international and other relevant institutions in the entire planning process has been recognized.

Stakeholder identification was done through both literature review and interactions with the client and key informants on the ground during field surveys. The technical staff of KVDA participated in this process through the shaping

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Source: Author, 2012
of the structure of the IRDMP they desired. During the data collection process, stakeholders were informed of the plan preparation process and they were able to contribute vastly to the content in this report. A complete list of key informants that participated in data provision on the ground has been attached as Appendix C to this report.

Upon presentation of this report to the Client, the consultants will hold at least one public forum in each of the five counties to give and receive feedback from the citizenry, NGO’s, the local community, research, and academic institutions. One regional forum will also be held towards the end of the process. These workshops will help in both the problem identification and plan formulation stages.

1.3.3 Data Analysis and Presentation Process:

Data analysis and presentation has been done through various methods as outlined below:

- The use of report writing
- The use of GIS mapping- various thematic maps were overlayed for analysis of interlocking spatial factors and this data presented in map form
- The use of Statistical Package for Social Sciences (SPSS) for analysis of household data collected

1.3.4 Challenges Faced in Conducting the Study:

Various challenges were faced in conducting this study and they included:

- The vastness of the area
- Inaccessibility of a majority of the areas due to poor road networks and harsh terrain
- Insecurity concerns in some areas
- Language barrier

These challenges however were addressed through the use of locals during the administration of questionnaires and travelling only during the day.

1.4 RATIONALE OF THE PREPARATION OF THE KERIO VALLEY IRDMP:

The first Regional Development Master Plan for KVDA was formulated in collaboration with Mwenge Associates between January 1986 and December 1987 and was made up of two volumes. Volume I was a sectoral synthesis of the socio-economic analysis done of the region. Volume II covered the recommendations and proposals drawn from the analysis.

Majority of these recommendations and proposals were not implemented by KVDA due to the inability of the policy document to address new and current realities that were coming up in the region. The document also failed to provide an implementation schedule that would have guided the Authority in putting into place proposed programmes with the relevant actors. The result was various feasibility studies being carried out and development of sectoral strategic plans, most of which did not make much reference to the 1986 Master Plan.

The need for a new IRDMP is further exemplified by the fact that 25 years later, many factors in the region and in the country at large have all rapidly changed. These include socio economic aspects, the political system, governance, topography, variations in biophysical landscape and the management of the environment. In addition, policy documents and legislation such as the Kenya Vision 2030, 2007 Regional Development Authorities Policy, the new Constitution and the Millennium Development Goals, which presently drive the development processes in the country, were not in place then. These among other policy documents were not in existence in the previous planning period thus making the old master plan obsolete.