

MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT PHASE TWO (LVEMP II) - KENYA

TIONOSOYIET INTEGRATED WETLAND MANAGEMENT PLAN (2014-2018), KERICHO COUNTY

A sustainably Managed Tionosoyiet Wetland Ecosystem with Desired Biodiversity that Support Community Livelihoods



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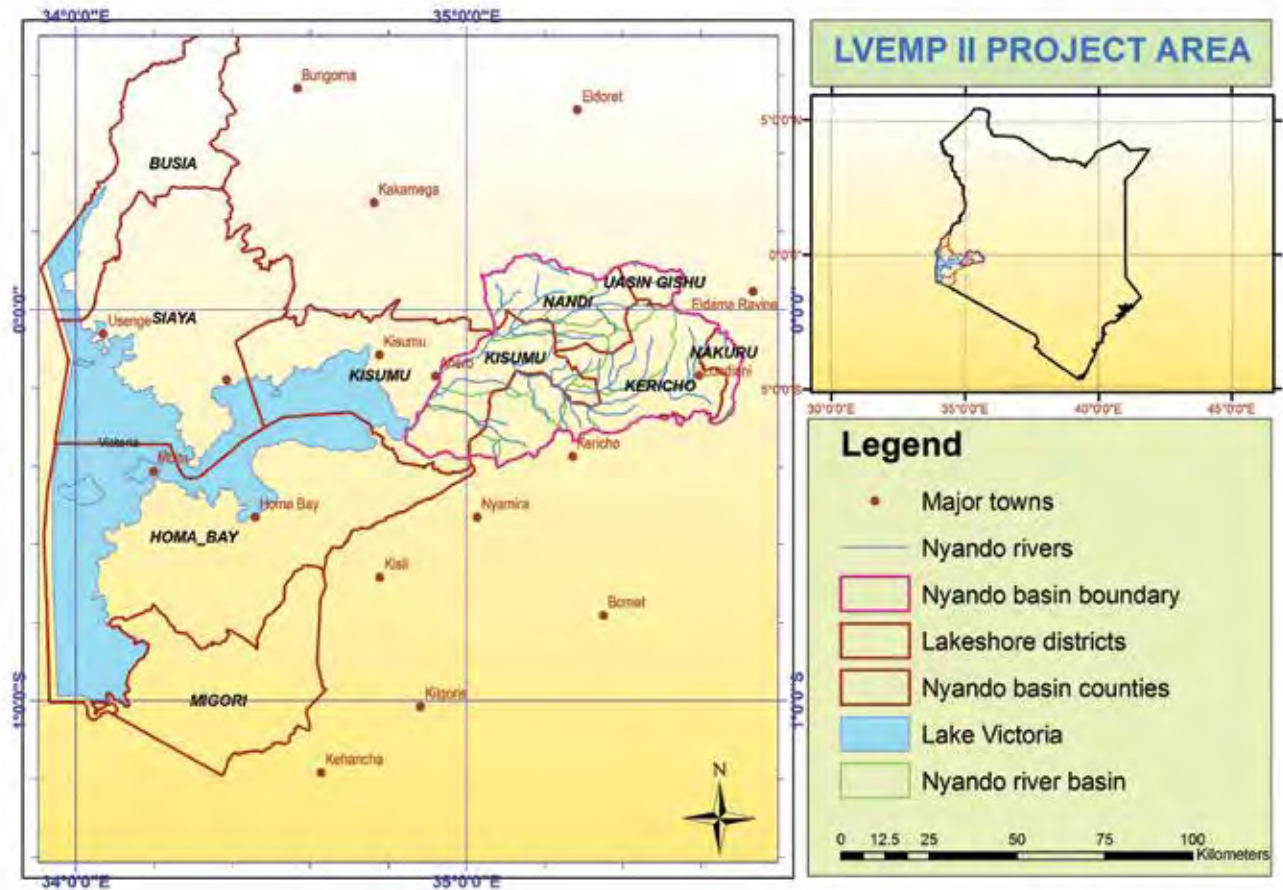
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# PROJECT COVERAGE AREA



## NYANDO RIVER BASIN



# FOREWARD

Wetlands are complex and vital ecosystems providing numerous benefits to both nature and mankind. They regulate water flow, recharge ground water, store and release water, filter nutrients and other pollutants, stabilize shoreline and microclimate and are of exceptional importance as habitats supporting biodiversity. Wetland habitats are also of high economic importance for provision of water and fisheries and thus supporting livelihoods to riparian and wetland-dependent communities.

In Kenya, wetlands cover approximately 14,000 km<sup>2</sup> (ca 3-4%) of the surface area of the country. They are rich in living and non-living natural resources, and are important sources of food, water, medicinal plants, fuel wood, materials for building and handcrafts.

Despite the myriad of benefits that they provide, wetlands continue to be drained at an alarming rate, to provide space for agriculture, human settlement and urban development among other competing developmental needs. These changes have had significant and deleterious effects to wetland ecosystems and the people depending on them due to pollution and the resultant loss of important ecosystem goods and services.

Given the fragility and vulnerability of many wetlands, there is an urgent need to strike a balance between the environmental functioning and wetland use for livelihood support. This requires management systems that take cognizance of the wetland ecosystems' natural characteristics while also allowing for their wise use. Such management regimes must be aligned to the Ramsar Convention's (1971) wise-use principle, which also requires development and implementation of Integrated Wetland Management Plans (IWMPs).

The Ministry of Environment, Water and Natural Resources (MWENR) continues to recognize the role wetlands play in the economy of this country and therefore has put in place the requisite legislations and policy frameworks to govern environmental and natural resource use in accordance with the Constitution of Kenya 2010 and the development blue print, Vision 2030. Further, the ministry shall enact appropriate legislation and review the old ones in order to align and make them current, responsive and relevant to address emerging environmental challenges including wetlands degradation and climate change.

The Tionosoyiet Integrated Wetland Management Plan (2014-2018) sets the stage for stakeholder coordination towards realizing sustainable management of this vulnerable urban-based wetland. The implementation of the various interventions set forth in this plan, envisions sustainable exploitation of the wetland resources. The Ministry of Environment, Water and Natural resources therefore calls upon all stakeholders and actors to implement this plan. Importantly, is the recognition of environmental management mandate as a concurrent jurisdiction between the two levels of government, in which case, the County Government of Kericho is urged to provide leadership and guidance towards realizing the vision of this plan's outcome.



**Richard L. Lesiyampe, Phd, MBS,**

Principal Secretary

Ministry of Environment, Water & Natural Resources

# PREFACE

Wetland Management requires collaborative efforts among the various actors of the Government, Non-State Actors, Media, local communities and institutions working towards the achievement of sustainable development. While the role of wetlands in supporting community livelihoods and enhancing resilience cannot be over-emphasized, the degradation of many wetlands in Kenya is a cause to worry.

The Environmental Management and Coordination Act of 1999, has provided substantial provisions and opportunities for conservation and sustainable management of wetlands in Kenya. Sections 42, 54 and 55 particularly, have elucidated the need for sustainable wetlands, marine and coastal resources. In addition, the subsidiary legislations (regulations) such as the Environmental Management and Coordination (EIA/Audit) regulation of 2003 and the Environmental Management and Coordination (Wetlands, Riverbanks, Lakeshore and Seashores Management) Regulations of 2009 among others, have further stressed sustainable development within and around wetland areas through development control and gazettement of wetlands as protected and conservation areas.

As the environmental watchdog, the National Environment Management Authority (NEMA-Kenya) will continue to discharge its mandate on supervision and coordination of matters relating to sustainable environmental management, recognizing wetlands as Ecologically Sensitive Areas (ESAs) and instituting appropriate measures to reverse wetland degradation and loss. Additionally, as the principle government instrument charged with environmental management including coordinating of development of wetland management plans, I want to sincerely thank all the stakeholders for taking their time and resources to ensure the finalization of this plan. We shall therefore support the successful implementation of Tionosoyiet Integrated Wetland Management Plan for the benefit of both present and future generations.



**Prof. Geoffrey Wahungu,**

Director General

National Environment Management Authority

# ACKNOWLEDGEMENTS

The Tionosoyiet Integrated Wetland Management Plan has been developed with support from many stakeholders, actors and the government. It is therefore a product derived from determination and commitment towards sustainable wetland management in Kenya. Apart from Ramsar Convention, the development of this plan fulfils National obligations as provided for in section 42 of the Environmental Framework Law, Environmental Management and Coordination Act, 1999 (EMCA, 1999).

Tionosoyiet Integrated Wetland Management Plan has set the motion towards ensuring wise-use and sustainable management of the wetland resources. The plan which envisions *a sustainably managed Tionosoyiet wetland ecosystem with desired biodiversity that support community livelihoods* is a product of commitments and good will of many stakeholders. Therefore, my gratitude goes to all the stakeholders who participated in the development of this important document.

The development and finalization of this plan involved considerable consultations with stakeholders both at the County and National Government levels as well as communities. In recognizing the value and role that wetlands play in providing ecological balance, this enabled privatization of wetlands and watershed management as critical components of LAVEMP II.

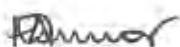
I recognize the financial support provided by the Government of Kenya and the World Bank without which this exercise could not have been achieved.

I want to thank members of the National Policy Steering Committee, National Technical Steering Committee and Project Coordinating Teams (NPCTs and DPCTs) for their valuable support and inputs during the wetland management plan preparation process. I wish to particularly thank the Principal Secretary, State Department of Environment and Natural Resources; as the Chairman of the National Policy Steering Committee and the Accounting Officer, for providing effective policy direction and decision making.

As this process was highly consultative, I am grateful for the patience, dedication, guidance, expertise and excellent facilitation accorded by the Lead Facilitators who steered the entire process right from community consultations, rapid ecological and hydrological assessments, drafting and finalization of this plan. In this regard, I owe much gratitude to Mr Benard Opaa, Ms. Stella Wanjala, Mr. Palapala Muteshi, Mr. Valentine Lala (all of NEMA-Kenya), together with the LAVEMP II Environment specialists Mr. Stanley Ambasa and Mr. Solomon Kihuu. I thank NEMA management for allowing these officers to participate and guide the process.

Also appreciated is the support accorded by the communities and the County Government of Kericho during consultations and fruitful inputs that have been essential in finalizing this plan. This has not only enabled ownership but also ensured that the plan's implementation is taken up by the County Government.

Last but not least, I am indebted to the Ministry of Environment, Water and Natural Resources, particularly to the Director Programmes, Projects and Strategic Initiatives / National Focal Point Officer, LAVEMP II Ms. Agnes Yobteric for her commitment and continued support during the entire plan development.



**Francisca Owuor,**

National Project Coordinator

Lake Victoria Environmental Management Project (LVEMP II)

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# LIST OF ACRONYMS

<b>LVEMP</b>	Lake Victoria Environmental Management Project
<b>Fig</b>	Figure
<b>GoK</b>	Government of Kenya
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>CBD</b>	Convention on Biological Diversity
<b>UN</b>	United Nations
<b>UNCCD</b>	United Nations Convention to Combat Desertification
<b>MEMR</b>	Ministry of Environment and Mineral Resources
<b>DPTC</b>	District Project Technical Committee
<b>NPTC</b>	National Project Technical Committee
<b>IWWM</b>	Integrated Wetland-Watershed Management
<b>IWRM</b>	Integrated Water Resources Management
<b>WRMA</b>	Water Resources Management Authority
<b>KFS</b>	Kenya Forest Service
<b>KWS</b>	Kenya Wildlife Service
<b>CBO</b>	Community-Based Organization
<b>FBO</b>	Faith-Based Organization
<b>CSO</b>	Civil Society Organisation
<b>KEWASCO</b>	Kericho Water and Sewerage Company
<b>KTDA</b>	Kenya Tea Development Agency
<b>KETEPA</b>	Kericho Tea Packers
<b>KEFRI</b>	Kenya Forestry Institute
<b>KEMFRI</b>	Kenya Marine Fisheries Research Institute
<b>KARI</b>	Kenya Agriculture Research Institute
<b>WRUAs</b>	Water Resource Users Association
<b>SCMPs</b>	SubCatchment Management Plans
<b>FMP</b>	Family Planning Method

# LIST OF ACRONYMS

<b>IMP</b>	Integrated Management Plan
<b>M and E</b>	Monitoring and Evaluation
<b>CFA</b>	Community Forest Association
<b>KEWI</b>	Kenya Water Institute
<b>P2P</b>	Plastic to Petrol
<b>NGO</b>	Non-Governmental Organization
<b>MP</b>	Member of Parliament
<b>LVB</b>	Lake Victoria Basin
<b>LVBC</b>	Lake Victoria Basin Commission
<b>LUP</b>	Land Use Plan
<b>LULUC</b>	Land use Land use Change
<b>EMCA</b>	Environmental Management and Coordination Act
<b>NEMA</b>	National Environment Management Authority
<b>MoA</b>	Ministry of Agriculture
<b>LVB</b>	Lake Victoria Basin
<b>AU</b>	Africa Union
<b>CoP</b>	Conference of the Parties
<b>SEA</b>	Strategic Environmental Assessment
<b>EIA</b>	Environmental Impact Assessment
<b>LMO</b>	Living Modified Organisms
<b>EAC</b>	East Africa Community

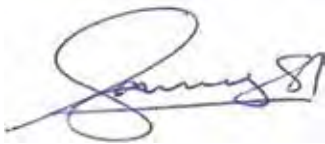
# EXECUTIVE SUMMARY

The development of Tionosoyiet management plan aims at ensuring wise-use and sustainable management of this wetland. The plan is intended to provide a paradigm shift towards better resources utilization.

This high-land wetland in Kericho County provides many services and goods to the communities and other users who rely on it for water for household, agricultural and industrial uses, and biodiversity/ecosystem support. It is a source of livelihood for the car-washers and acts as a sponge and filter for the nutrients and other pollutants from wastes and wastewater generated from the catchment including Kericho town urban run-off, which cause water pollution and biodiversity and livelihood losses. In addition, uncoordinated approaches and inadequate enforcement of laws and legislations have resulted into the degradation and deterioration of the wetland quality.

The Integrated Management Plan (IMP) was developed through a rigorous stakeholder consultative process, provides the ultimate framework for wise-use interventions for the Tionosoyiet wetland and associated catchment areas. The aim of the plan is to guide conservation and wise-use of the wetland resources in the achievement of sustainability as demanded by both the national Blue print- Vision 2030 and the Constitution of Kenya 2010. The plan has identified the strategic objectives, actions, indicators of success and actors intended towards broader stakeholder engagement, capacity building and resource mobilisation. Key actions include catchment management, water pollution control and solid waste management, improving household food security and income levels and advancing monitoring and participatory research that inform policy formulation and structured decision-making processes.

Together with stakeholders, the County Government of Kericho commits to the full implementation of this plan in order to promote wise-use and improve community livelihoods. We will continue to provide an enabling environment for green investments and projects that mainstream and prioritize environmental management. In this regard, we are therefore urging all stakeholders to support the implementation of this plan by initiating strategic development and investment options anticipated within this planning framework.



**His Excellency,**

**Prof. Paul Kiprono Chepkwony**

Governor,

Kericho County

# 1.0 INTRODUCTION

The Tionosoyiet wetland, as it is referred by communities, is located 1 km northeast of Kericho town, in Kericho County and it is a relatively small wetland of 34 ha in a catchment of 2,3000 ha (Fig. 1). The wetland is located in the upper reaches of the Sondu-Miriu river system. This is a permanent riverine wetland that lies in a wide flat valley bottom separating steep undulating topography on both sides. The surrounding land use consists largely of small-holder agricultural land and commercial tea (*Camellia sinensis*) plantations but with significant urban and peri urban components. Subsistence agricultural crops include maize (*Zea mays*), potato (*Solanum tuberosum*) and various market vegetables. The wetland catchment includes the Nyagacho housing area to the northwest and a significant proportion of the Kericho town area to the south and east. The area is not fully sewerred and solid waste disposal is limited.

Given its urban setting, Tionosoyiet wetland is currently used by the local community for a variety of purposes such as bathing, laundry, water supply, car washing and recreational activities. There is limited informal grazing by cattle and goats, but this has been curtailed by the establishment of the arboretum and associated fencing that was performed by the LVEMP I wetlands component. With this urban setting and other constraining factors including the poor soils present and the flood risk inherent in using the site, there are few potential land uses.

It is recommended that the wetland be preserved in its present state with access at limited points to allow the local community to continue using the wetland for washing, bathing and for recreation. Further efforts should be taken to formalize access points for the local community and to curtail livestock access to the wetland. The appropriateness of the car wash at the upstream extremity of the wetland needs further scrutiny. This activity should only be allowed to continue if access points where water is taken from the wetland are formalized and if wash waters are contained more formally. Establishment of a well maintained site car wash site with the oil-water and solids separators is required, and the ultimate aim of establishing water recycling and a zero discharge policy is recommended.

These points are expanded on in the wetland management plan for the Kericho's Tionosoyiet.

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**PLATE 1: PART OF THE TIONOSOYIET WETLAND**



**FIGURE 1: DRAINAGE AND LOCATION OF TIONOSOYIET WETLAND, KERICHO COUNTY.**



## 1.1 BIODIVERSITY

The wetland comprised a dense, diverse mosaic of wetland plants dominated by *Cyperus* spp. (*C. immensus*, *C. triandra*) with some *Typha* spp. (*T. domingensis* and *T. capensis*) and *Polygonum* spp. (*P. senegalense*, *P. pulchrum*). *Potamogeton schweinfurthii* grows in areas where emergent vegetation was absent, such as near the inflow streams at the head of the wetland and in small areas near the outflow monitoring point. During the planning exercise, wetland vegetation was lush and was notable for its heterogeneity and lack of zonation. A full list of vegetation known to be present in the wetland is presented in table 1.

Tionosoyiet wetland is known to be used as habitat by a few species of wetland birds, most notably grey crested cranes (*Balearica reulorum*). Anecdotally, the local community considers that the wetland also harboured snakes and small nocturnal omnivorous mammals (ratel *Mellivora capensis* and common genet *Genetta genetta*). The eastern bank of the wetland is an arboretum that was planted with a variety of trees, established through the LVEMP I wetlands component, now administered by the Kericho Municipal Council. The site has been fenced off but grazing by goats and cattle has not been completely eliminated. The western bank above the wetland has secondary scrub forest that is mostly indigenous with significant incursions of blue gum (*Eucalyptus saligna*).

## 1.1.1 VEGETATION TYPES

Predominant flora has been determined for the wetland, however, it should be noted that the lists are not exhaustive and will require updating and ongoing review, in recognition of the dynamic nature of the wetland plant communities. For this wetland, the bulk of the vegetation is dominated by *Cyperus* spp. (sedges) followed by well scattered *Polygonum* spp. The Tionosoyiet wetland is mainly covered with emergent vegetation particularly sedges; however *Cyperus papyrus* is the most significant wetland plant in the Lake Victoria Basin given its widespread occurrence, buffering abilities and socioeconomic importance.

**TABLE 1: AN INVENTORY OF PLANT SPECIES NOTED AS PRESENT IN TIONOSOYIET:**

PLANT SPECIES	PLANT SPECIES
<i>Polygonum saicifolium</i>	<i>Cyperus rotundus</i>
<i>Polygonum senegalense</i>	<i>Cyperus laevigatus</i>
<i>Polygonum pulchrum</i>	<i>Cyperus latifolius</i>
<i>Potamogeton schweinfurthii</i>	<i>Eragrostis tuneifolia</i>
<i>Typha domingensis</i>	<i>Mimosa pigra</i>
<i>Typha capensis</i>	<i>Ludwigia stolonifera</i>
<i>Eragrostis barteri</i>	<i>Eragrostis</i> sp.
<i>Eragrostis lappula</i>	<i>Ipomoea</i> sp.
<i>Eragrostis milbraedi</i>	<i>Achyranthes aspera</i>
<i>Eragrostis stapfii</i>	<i>Hibiscus</i> sp.
<i>Amaranthus hybridus</i>	<i>Echinochloa</i> sp.

## 1.2 DRAINAGE

The major inflows to the wetlands draining the catchment are:

- (i) A spring in the north-eastern extremity of the wetland that discharges with a very consistent flow. The discharging water was clear and was not monitored to be affected by rainfall. The spring fed a stream that flowed into the wetland about 30m away. The spring was used by the local community for bathing and washing.
- (ii) A storm water drain, running along the main road from the town centre, provided input to the Northern extremity of the wetland. The drain collected surface runoff from the north road surface among other areas. Discharges from the drain were heavily laden with soils, sand, plastic materials, polyethylene bags, textiles, paper, wood and metallic refuse.
- (iii) The main stream, officially marked on survey maps as the Dionosoyiet River is known by the local community as Tionosoyiet, the name meaning “place of water buffalo”. Water from the stream enters the wetland system that run from the eastern direction. The catchment covers an agricultural area with mainly land use activities such as tea, and scattered residential houses. The catchment topography comprises of steep slopes and valleys with permanent streams.
- (iv) The Ainaptindinyetin stream is the fourth inflow, coming from the Northern direction. It drains an agricultural area with a rural settlement setting. Like the above, the catchment is also steep sloped.
- (v) The fifth inflow is known as the Ainabtindinyiek stream, which enters the wetland from a northwestern direction. It drains a catchment mainly comprising urban settlement in the immediate vicinity of the wetland and agricultural activities further upstream.



(vi) Minor ephemeral roadside drains enter the wetland along its western edge.

During storm events, there is considerable and rapid run-off from the paved, urban areas. Under these conditions, the inflows at the storm drain from town and minor drains on the eastern side of the wetland have high sediment concentrations and carry high gross pollutant loads such as plastic bags. Minor temporary diversion works combine flows from the minor drains and force them to flow towards the western most permanent inflow stream, the Ainabtindinyiek. The outlet of the wetland is seven-cell culvert: 4 lower culverts and 3 higher culverts.

The culverts are set in an embankment that is used as a walkway by the local community between Kericho town and Nyagacho. A side spillway allows high flows to exit the wetland as the top three culverts begin to be submerged. Under extreme flows, the embankment itself would also be submerged and act as a broad crested weir, although the integrity of the structure itself is questionable and there is considerable risk that failure of the embankment could occur under high flow conditions. Although significantly wider at inlet than outlet, the study site can be construed as a linear wetland approximately 400 m long by 80 m wide. Protection works for the wetland carried out by the LVEMP I demonstrated the need for stakeholder involvement and cooperation in ensuring sustainability of wetland conservation for present and future uses.

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## 1.3 LAND USE SETTING

### EXISTING AND POTENTIAL LAND USE

Generally land use patterns oscillate around farming /agriculture: growing maize, vegetables, tea, fruits; livestock husbandry; mixed deciduous forests; degraded forests; old clearing/shifting cultivation; built areas; urbanized/town area; emergent wetland area; riverine wetland; springs; open water and submerged areas among others.

During field visits, distinct patterns of catchment activities were observed immediately around the site, depending on their bearing from the wetland as follows:

#### 1.3.1 SOUTH AND EAST

Kericho town is located to the southeast of the site, with the town cemetery lying between the wetland and the town centre. The town represents one of the most significant diffuse sources of pollution to the wetland, with sewage entering the wetland in the lower parts of the wetland, downstream. Key areas within the town from which pollutants are likely to be derived are:

- (i) The market place, located about 500m from the southernmost point of the wetland, and spans about 5 ha. Some of the activities at the market include open air sale of fresh food, grains, used and new clothes and household utensils. In addition, there is a terminal for public transport vehicles in the middle of the market area. The market area and matatu terminal are therefore likely to be significant sources of nutrients, sediments and gross pollutants.
- (ii) To the east of the open air market, there is an informal cottage industrial site where artisans fabricate a wide range of items including cooking pots, farm implements, vehicle spare parts, furniture and collection of recyclable materials among other products. Again this site is likely to contribute significant amounts of sediments, and gross pollutants into the wetland.
- (iii) Further south is the town centre with various commercial activities. These include general shops, hardware shops, food outlets, service stations, garages, pharmacies and numerous workshops. Nutrients, gross pollutants, suspended solids and heavy metals are likely to be high from this area.
- (iv) The town's industrial area is located between the town centre and the wetland.

However, there are limited manufacturing factories, most of them being cottage industries. Again as for the town centre, nutrients, gross pollutants and suspended solids are likely to be quite high from this area.

- (v) There are residential houses to the south west of the wetland. The roads in this area are unpaved, so suspended solids; nutrients are likely to be high here, with high chances of getting drained into the wetland.
- (vi) A large number of the roads around the town have no formalized footpaths and many are unsealed. The town area is served with a sewer network connected to the main municipal sewerage works to the far western end of the town. Effluent from the KEWASCO Sewage Treatment Plant is discharged into the wetland;

### **1.3.2 NORTH**

The key features to the east of the site include:

- (i) A primary school located about 200m from the site;
- (ii) Tea plantations beyond the school in the far North East;
- (iii) The Kericho greens stadium is also located here with an informal;
- (iv) Small land holdings for subsistence agriculture in a peri-urban setting; and
- (v) A small number of informal residences close to the wetland.

### **1.3.3 NORTH WEST**

The northern and western sides of the wetland mainly consist of informal residential settlements, especially in the Nyagacho area. This area is densely populated and hosts a wide range of economic activities such as shops, garages, food outlets and butcheries. The area is not sewered, and has no organized solid waste collection systems. Much of the area drains into the wetland.

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## **1.4 SOILS, TOPOGRAPHY AND GEOLOGY**

The Tionosoyiet wetland physiographically lies on a volcanic footbridge. The area is undulating to rolling with slopes of 7 – 16%. The soils in the wetland are developed on tertiary or older basic igneous rocks such as basalts with soil depths greater than 120 cm.

Soil physico-chemical and nutrient content analyses show that the soil pH is acidic which is not favorable for crop growth. In order to undertake cropping, it is necessary to neutralize the soil acidity through the application of lime prior to planting. Soils at Tionosoyiet have a two-layer horizon profile, as described below.

### **1.4.1 SOIL HORIZON 1**

The uppermost soil horizon extends from the surface to between 16 and 30 cm depth. This clay layer ranges from dark brown to very dark grey in colour. This layer is slightly hard to very hard when dry, friable to firm when moist and plastic when wet. Grains display a medium sub angular to angular and blocky structure slightly hard too hard when dry. There are abundant fine to very fine roots present in the many micro to very fine pores that are present.

### **1.4.2 SOIL HORIZON 2**

Below the upper horizon, a second horizon is present extending to a depth of 70 to 160 cm. This layer is dark grey to black in colour, is very hard when dry, firm to very firm when moist and firm, sticky and plastic when wet. The layer has a medium angular to sub angular block structure with few micro pores and very fine pores. Very fine and fine roots are common through the structure.

## 2.0 INTERNATIONAL, REGIONAL AND NATIONAL CONVENTIONS AND POLICES ON WETLAND CONSERVATION AND MANAGEMENT

The United Nations Conference on Environment and Development (Earth Summit) held in Rio de Janeiro, Brazil in June 1992 marked a high point in the development of international environmental law. Apart from adopting the Rio Declaration on Environment and Development as well as Agenda 21, the Heads of State and Governments launched the ratification process for the CBD and the United Nations Framework Convention on Climate Change (UNFCCC).

Kenya is a signatory as well as a party to various international conventions, treaties and protocols relating to the environment and aimed at achieving sustainable development. The agreements are both regional and international and became legally binding on Kenya upon ratification thereof by the rightfully designated Kenyan Authority.

The global policy context is defined by the processes around the Ramsar Convention and other relevant environmental conservation treaties and conventions, notably the Rio Declaration and Agenda 21, the United Nations Convention to Combat Desertification (UNCCD), and the Convention on Biological Diversity (CBD). The regional policy context on the other hand is defined by the integration arrangement between Kenya and its four neighbouring countries within the framework of the East African Community (EAC). The Treaty Establishing the East African Community and the Protocol on Environment and Natural Resource Management are the key instruments in this regard. The national level context is defined by the Constitution, the National Land Policy, and the other policies and laws.

Currently, there are two important draft policies relating to the management of wetlands viz: the draft Wetlands Conservation and Management Policy 2012 and the draft Environment Policy 2012.

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### 2.1 GLOBAL CONTEXT

#### 2.1.1 RAMSAR CONVENTION ON WETLANDS

The Convention on Wetlands of International Importance (the Ramsar Convention on Wetlands, 1971) is the international Convention that has the greatest bearing on the sustainable management of Wetlands. The Convention, which is the only global environmental treaty that deals with a particular ecosystem, was negotiated outside the framework of the UN system, and its text agreed at an international conference in Ramsar, Iran on 2nd February 1971. The following day it was signed by representatives of 18 countries. It came into force in December 1975. Kenya ratified the Convention on 5th October 1990 and has 5 wetlands listed as Wetlands of International Importance, covering a total surface area of 101,849 hectares. The convention provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Parties commit themselves to the three pillars of the Convention, namely: to work towards the wise use of all their wetlands through national land use planning, appropriate policies and laws, management actions and public education; to designate suitable wetlands for the List of Wetlands of International Importance (“Ramsar List”) and ensure their effective management; and to cooperate internationally concerning transboundary wetlands, shared wetland systems, shared species and development projects that may affect wetlands.

Parties to the Convention also commit to specific actions regarding formulation and implementation of national plans so as to promote conservation of listed wetlands and the wise use of wetlands in their territory; research and exchange of data and publications regarding wetlands and their flora and fauna; and training of personnel in wetlands research, management and wardening.

In spite of this really comprehensive framework at the global level, the challenges to wetlands management and conservation have persisted. The global framework is useful for setting standards and creating mechanisms for collaboration especially with regards to transboundary dimensions of environmental conservation and management, but ultimately the gains of for the environment can only be realized when the imperatives set in global agreements and commitments are translated into actions at the local/national level. It informs the requirement for national frameworks articulated by the Ramsar Convention.

The need for national wetland policy frameworks for conservation and management of wetlands is alluded to in Article 3 of the Convention which enjoins Contracting Parties to “formulate and implement their planning so as to promote the conservation” of listed and other wetlands in their territories, although the Article does not specifically mention ‘policy’. It is however in Recommendations and Resolutions made by Contracting Parties in periodic Conferences of the Contracting Parties (COP) that the requirement for national policies has been made more explicit.

By Recommendation 4.10 on Guidelines for the implementation of the wise use concept, the Parties agreed that “It is desirable in the long term that all Contracting Parties should have comprehensive national wetland policies, [which] should as far as possible address all problems and activities related to wetlands within a national context”. Resolution VII.6 passed by the 7th Conference of the Contracting Parties held at San José, Costa Rica in 1999 adopted guidelines for developing and implementing national wetland policies, which were issued as an annex to the Resolution, and urged those Parties that had not yet developed such policies to give the highest priority to the matter. A Handbook on National Wetland Policies has been published by the Ramsar Secretariat to provide guidance to national governments in developing appropriate policies.

In Kenya, the need for a stand-alone wetland policy is justified by the fact that wetlands are seldom explicitly covered at national level in other natural resource management policies such as for water, forest, land, and agriculture, which denies wetlands the recognition and targeted action to deal with problems and challenges associated with their sustainable conservation and management. A wetland policy thus provides an opportunity for giving recognition to wetlands as ecosystems requiring different approaches to their management and conservation and avoids the risk of wetlands conservation being marginalized by other sectoral management objectives. As such, a National Wetland Policy should reflect attitudes, desired principles, goals, objectives and aims, show what choices have been made about strategic directions, make commitments, provide a focus for consensus, express concerns and provide advice, and clarify roles and responsibilities.

The key challenge in thinking about a National Wetland Policy is how to reconcile the need for specific attention, which drives the quest for a stand-alone policy on wetlands with the fact that wetlands constitute components of ecological systems, so that their sustainable conservation and management is only possible within the overall framework of environment and natural resources management. The policy imperatives that inform the management of land, water, forests, and biodiversity, among others, have a direct bearing on the opportunities for proper management of wetlands. Tionosoyiet wetland is not yet listed as a Ramsar site but the development of this management plan sets the pace towards this process as it harbours some unique species such as crested cranes. .

## **2.1.2 THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)**

The Convention on Biological Diversity requires Parties to use Environmental Impact Assessment (EIA) effectively to avoid or minimize significant adverse impacts on biodiversity; it introduces Strategic Environmental Assessment (SEA) to assess environmental implications of policies and program particularly for those with major implications for natural resource use, for example, agriculture/ irrigation. Wetlands biodiversity is heavily recognized by this Convention.

The CBD came into force in December 1993 upon receipt of the requisite number of ratifications. Kenya was among the countries that signed the Convention at Rio, and proceeded to fully ratify it on 26th July 1994. The country had been closely associated with the development of the Convention as its final negotiations were done in Nairobi.

The Convention seeks to promote the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the use of genetic resources. It commits State Parties to

maintaining the integrity of biological diversity and its components out of appreciation of its critical and multiple values to life and its importance “for evolution and for maintaining life sustaining systems of the biosphere”.

Wetlands constitute an integral part of the concerns of the Convention, as is evident from the definition of biological diversity and ecosystem in Article 2. Biological diversity is defined as “the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems”, while ecosystem is defined as “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”.

The Convention obligates State Parties to develop national strategies, plans or programmes for conservation and sustainable use of biological diversity, and to integrate the conservation and sustainable use of biological diversity into sectoral or cross-sectoral plans, programmes and policies. Specific measures that Parties are enjoined to take in this regard include identifying components of biological diversity that need to be conserved and monitoring their conservation whether in-situ or ex-situ; integrating considerations of conservation and sustainable use into national decision-making processes; encouraging and protecting customary uses of biological resources that are compatible with conservation or sustainable use requirements; supporting local communities to rehabilitate degraded wetland areas; and encouraging cooperation between government and private sector in developing methods for sustainable use of biological resources. Furthermore, Parties shall develop and implement social and economic incentives, promote research and training, public education and awareness creation, and environmental impact assessment to arrest and minimize adverse impacts on biological resources. Detailed provisions are also made for international cooperation in terms of technology transfer, information exchange and financing.

The Convention also led to formation of the Cartagena Protocol on Biosafety of 1999 namely “The Cartagena Protocol on Biosafety to the Convention on Biological Diversity”. This is an international treaty governing the movements of Living Modified Organisms (LMOs) resulting from modern biotechnology from one country to another. It was adopted on 29 January 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force on 29th January 2000. Kenya signed the protocol on 15th May 2000; ratified it on 24th January 2002 and became a party member on 11th September 2003.

### **2.1.3 THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)**

The United Nations Framework Convention on Climate Change (UNFCCC), 1992 requires parties to take climate change considerations into account, to the extent feasible. It emphasizes on the need of incorporating the consideration in relevant social, economic and environmental policies and actions, and encourage the employment of appropriate methods, for example impact assessments to be formulated and determined nationally, with a view of minimizing adverse effects on the economy, public health and the quality of the environment. Wetlands such as Tionosoyiet play significant roles in micro-climate enhancing and act as strong water storage systems holding and releasing the much needed water for various uses, especially during dry season, situations currently experienced by communities as a result of climate change and variability.

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## **2.2 THE REGIONAL CONTEXT- THE EAST AFRICA COMMUNITY TREATY**

The regional context for wetlands conservation and management is defined by the EAC, the regional integration framework that groups Kenya together with Burundi, Rwanda, Tanzania and Uganda. The Treaty Establishing the EAC recognizes the importance of natural resources to the economic development of the region. Article 5 thereof links the achievement of economic development to “the promotion of sustainable utilization of the natural resources of the Partner States and the taking of measures that would effectively protect the natural environment of the Partner States”. Furthermore, Chapter 19 of the Treaty provides for cooperation in environment and natural

resource management to realize objectives that include ensuring “sustainable utilization of natural resources like lakes, wetlands, forests and other aquatic and terrestrial ecosystems”. The Community has developed a Protocol on Environment and Natural Resource Management to further strengthen cooperation. In this regard Article 14 of the Protocol deals with sustainable management and wise use of wetland resources, and commits the Partner States to develop, harmonize and adopt common policies, laws and strategies for the purpose. It seeks to supplement the Ramsar Convention by providing for development and adoption of common guidelines and criteria for the declaration of any wetland other than a Ramsar site as a protected wetland. In addition, the Lake Victoria Basin Commission (LVBC) envisions working together to conserve Lake Victoria Basin and improve Livelihoods for the riparian communities. Tionsoyiet wetland is located within the Kenyan side of the Basin and therefore developing this plan is in tandem with the spirit of the LVBC principles and aspirations.

Kenya has also been part of processes within the framework of the African Union (AU) that led to the adoption of the Framework and Guidelines on Land Policy that articulates principles to inform the development and implementation of land policies in Africa. The Framework and Guidelines underscore the need to conserve and manage natural resources and ecosystems including wetlands. National land policies are thus expected to provide frameworks for conserving and managing such ecosystems to create foundations for sector specific policies and strategies.

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## 2.3 THE NATIONAL CONTEXT

The national context is defined largely by the Constitution, Draft Environment and Wetlands Policies, the National Land Policy and legislation introduced to give effect thereto. Also of relevance are other sector specific policies and laws touching on wetland/water resources management.

### 2.3.1 THE CONSTITUTION OF KENYA 2010

The promulgation of a Constitution in August 2010 marked an important turning point for the country in many respects including with regard to the management of land and natural resources. Constitution informs policies and laws that are currently being developed as well as the need to align old laws and legislations and policies with it. In this connection, the most significant development is the introduction of constitutional principles for land, environment and natural resources management. This is significant because the lack of a constitutional foundation for sustainable management of natural resources has long been identified as one of the key constraints undermining efforts to put in place appropriate frameworks. The multiple policies, legal and institutional frameworks that exist in the country have had no overarching unifying principles to reconcile them, a situation that has engendered conflict and contradiction in governance and management of land and natural resources.

Article 60 of the Constitution entrenches principles of land policy that shall henceforth inform the manner in which land is held, used and managed in Kenya, with a view to ensuring equity, efficiency, productivity and sustainability. Two of these principles – sustainable and productive management of land resources, and sound conservation and protection of ecologically sensitive areas – are of particular relevance to the design of an appropriate framework for conservation and management of wetlands.

The Constitution entrenches the three land tenure systems, namely: public, community and public. Water catchment and specially protected areas are vested in the national government to hold in trust for the people of Kenya. The use and disposition of public land is to be governed by an Act of Parliament. Existing land laws are to be revised, consolidated and rationalized, while sectoral land use laws are to be revised in accordance with the principles of land policy set out in Article 60.

Article 69 of the Constitution imposes obligations on the State with regards to the environment, which are of relevance to this management plan. The State shall, inter alia, ensure sustainable exploitation, utilization and management and conservation of the environment and natural resources, and ensure the equitable sharing of accruing benefits; encourage public participation in the management, protection and conservation of the environment; and eliminate processes and activities that are likely to endanger the environment. Individual citizens have a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Another major development introduced by the Constitution is devolved government, which was inaugurated after the general elections (March 2013). Among the functions of county governments is the implementation of specific national government policies on natural resources and environmental conservation, including soil and water conservation and forestry. Clearly, county governments have an important role to play in implementation of Wetlands Policy and Wetlands Management Plans.

## **2.3.2 THE NATIONAL LAND POLICY**

The adoption of the National Land Policy in August 2009 marked the culmination of a long process and was a significant achievement in the search for a lasting solution to the challenge of land governance and management. Although it preceded the Constitution by a whole year, the two processes were closely linked as they both responded to the need for a comprehensive framework for reconciling competing interests over land and natural resources.

The National Land Policy highlights the need for policy responses to poor environmental management and inappropriate ecosystem protection and management. It recommends policy responses that include adoption and implementation of Land Use Plans (LUPs). It outlines principles to guide the protection of watersheds, lakes drainage basins and wetlands. These include: prohibition of settlement and agricultural activities in water catchment areas; identification, delineation and gazettment of all water courses and wetlands in line with international Conventions; and integrated resource management based on ecosystem structure regardless of administrative or political boundaries. The Government also commits to ensure that all land use practices conform to land use plans and principles of biodiversity protection, conservation and sustainable development. This comprehensive management plan adopted Ecosystem-Based management (EBM) approaches requiring broader and holistic management regimes across boundaries.

## **2.3.3 LAND LAWS**

Three new land laws have been enacted to give effect to the provisions of the Constitution and the National Land Policy, namely the Land Act, the Land Registration Act and the National Land Commission Act. Provisions of Land Act and the National Land Commission Act are of relevance to this wetland management plan.

The Land Act seeks, among other things, to provide for the sustainable administration and management of land and land based resources. It reinforces the principles of land policy set out in the Constitution. Section 11 of the Act empowers the National Land Commission to take appropriate action to maintain public land that has endangered or endemic species of flora and fauna, critical habitats or protected areas and to identify ecologically sensitive areas that are within public lands and demarcate or take any other justified action on those areas and act to prevent environmental degradation and climate change subject to consulting with existing conservation institutions. The Commission shall also make rules and regulations for the sustainable conservation of land based natural resources that include measures to protect critical ecosystems and habitats.

The National Land Commission Act provides for the functioning of the National Commission established by Article 67 of the Constitution. Among its functions is to monitor and have oversight responsibilities over land use planning throughout the country. In this connection, it shall be in a strategic position to ensure that the provisions of the National Land Policy regarding land use planning and ecosystems management are implemented, including those touching on wetlands such as Tionosoyiet.

## **2.3.4 DRAFT WETLAND CONSERVATION & MANAGEMENT POLICY (2013) AND THE DRAFT ENVIRONMENT MANAGEMENT POLICY (2013)**

The development of the wetlands policy has been going on for over a decade, (started in 1998) during which time significant changes have occurred in the national context for governance as well as environment and natural resource management, particularly as a result of the adoption of the National Land Policy and the promulgation of the Constitution of Kenya, 2010. The draft policy with its eight objectives aims to achieve sustainable management and conservation of Kenya's wetlands through community participation and developing strategic programmes aimed at restoring the ecological integrity of these fragile and vulnerable resources. The draft policy has been undergoing review to align it to the Constitution of Kenya 2010 and also make it current and relevance as per the conditions prevailing both in terms of governance as well as challenges and opportunities thereunto. The draft wetland Policy, adopted by the National Environment Council (NEC) in 2013, when enacted, the policy shall ensure Kenya's commitment to the Ramsar convention, which it is party to and therefore provide the resonance framework/direction on wise use and sustainable management of wetlands.

In addition, the draft Environment Management policy (2013) is the overarching environmental policy that provides direction on sustainable environmental management. Wetlands (coastal and marine-based and freshwaters) have clear provisions as key ecosystems in the natural environment land/seascape and recognized as critical natural capital.

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## **2.4 OTHER SECTORAL POLICIES AND LAWS**

Apart from the Constitution, Land Policy and land laws, other policies of relevance to wetlands conservation and management include Vision 2030, EMCA, and sector specific laws policies and laws on water, forests, agriculture, Fisheries and wildlife conservation among others. Even where they do not specifically refer to wetlands, these policies and laws have a bearing on wetlands conservation and management by reason of the linkage between wetlands and the resources that they relate to within these sectors.

Vision 2030 is the national development blueprint that aims to deliver a globally competitive Kenya by the year 2030. Its Social Pillar integrates environmental management and privileges conservation and the building of institutional capacity for environmental planning and governance to improve overall management of the environment. Although it does not specify any strategies and interventions related to wetlands, Vision 2030 sets the stage for ecosystems approaches to environmental management, especially given its emphasis on water catchment management and land cover and land use mapping. Management of catchment and recognition of water-based tourism provides entry points into sustainable of water and wetlands in the country.

### **2.4.1 ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT (EMCA) NO. 8 OF 1999**

Part II of the said Act states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. In order to achieve the goal of a clean Environment for all, new projects listed under the Second Schedule of Section 58 of EMCA No. 8 of 1999 shall undergo an Environmental Impact Assessment. EMCA is a framework law on environment that establishes the institutional framework and makes elaborate provisions for management of the environment and its component parts including wetlands. It establishes the National Environment Management Authority (NEMA) to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment. Among the tools and mechanisms the Act establishes for environmental conservation and management include environmental planning from the local to the national level, environmental impact assessment, environmental audit and monitoring, and environmental restoration and conservation orders.

The Act makes elaborate provisions for protection and conservation of wetlands under Sections 42 and 43. It prohibits activities that compromise the integrity of wetlands, requiring prior written approval of the Director-



General of NEMA, which can only be given after an environmental impact assessment (EIA). It also provides that the Minister may, by notice in the Gazette declare a wetland to be a protected area and impose such restrictions as may be necessary. The Minister may also, by notice in the Gazette, issue general and specific orders, regulations, or standards for the management of wetlands, including measures for management, protection or conservation where there is risk of environmental degradation. Such measures may include management plans.

Main Sections of EMCA Relevant to the Sustainable Management of Tionosoyiet Wetland include;

- Section 42- Conservation of Wetlands -This section guides on conservation of rivers, lakes and wetlands and requires any activity conducted within the wetland to be authorized by the Director General.
- EMC (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 -The regulation aims at increasing the coverage of protected areas and establishing new special status sites. The regulation also intends to revitalize Agriculture by 2014 through comprehensive development of the agricultural sector at all levels for the benefit of the population
- EMC (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009 - The aim of this regulation is to ensure conservation and sustainable use of wetlands in Kenya whether occurring in private or public land.
- Section 4 of the regulation outlines the objective of the regulation which includes providing guidelines for the conservation and sustainable use of wetlands and their resources in Kenya;
- Section 5 (1) of the regulation outlines the General Principles to be observed in the management of all wetlands in Kenya
- Section 5 (2) of the regulation states that the obligations of the Regulations should be implemented while taking into account the provisions of other statues under different ministries.
- Section 11 of the regulation permits the use of wetlands for domestic use among other uses.
- Section 13 lists activities that may require temporary permits for the use of wetland including emergency cases and research activities requiring use of wetlands. The temporary permits will be valid for three (3) months only as stated under section 13(2).

Part III of the regulation gives guidelines on management of river banks, lake shores and sea shore in Kenya.

- Section 17 of the same part outlines the general principles to be observed in the management and conservation of river banks, lake shores and the seashore
- Section 18 of the regulation provides conservation measures for wetlands. Part (c) of the same regulation promotes soil conservation measures along river banks, lake shores, and the seashore which includes the following measures: bunding, terracing, mulching, tree planting or agro forestry, grassing, soil engineering, compaction and placement of fills, zoning and planning; building of gabions, control of grazing, and recommending the promulgation of appropriate by-laws by the local authority.

The proponent would be required to follow the requirements of this regulation especially since the proposed project is located in a wetland inhabited with local communities and is prone to floods.

- EMC (Water Quality) Regulations, 2006

This regulation prohibits pollution of water bodies and encourages the engagement of the community in protection of water bodies both surface and underground. The regulation guides on several wetland management practices including:

- Restriction of water abstraction without conducting an Environmental Impact Assessment
- Observation of wetlands riparian zone of between 6-30m form the highest flood water mark of a water body
- Compliance with the water quality for irrigation and domestic use as stated under the first and eighth schedule of the regulation respectively.
- Provision of monitoring parameters for water bodies as listed under schedule two of the regulation

Other sectoral policies and laws, in particular Sessional Paper No. 1 of 1999 on National Policy on Water Resources Management and Development (Water Policy), the Water Act, 2002, Sessional Paper No. 1 of 2007 on Forest Policy, the Forests Act 2005, the Agriculture Act, Cap 318, and the Wildlife (Conservation and Management) Act have implications for wetlands conservation and management because they relate to natural resources that are closely related to wetlands. Some of the policies and laws relate to land uses that are undertaken within wetlands. Ultimately, the implementation of these policies and laws has a direct bearing on the conservation and management of wetlands and vice versa.

## **2.4.2 THE WATER POLICY AND WATER ACT 2002**

The Water Policy identifies lack of proper inter-linkages and poor coordination amongst the various sectors dealing with different aspects of water and water resources management as one of the major challenges to the sector. It recommends an Integrated Water Resources Management (IWRM) approach that ensures coordinated development and management of water, land and related resources in a sustainable manner. This approach is underpinned by a river basin or catchment as the smallest unit of planning and management of water resources. It seeks to promote social and economic benefits of the people in a catchment area in a manner that is equitable and does not compromise the sustainability of vital ecosystems. It thus addresses social, economic and environmental dimensions of water resources management from an ecosystem-wide perspective consideration.

The Water Act provides guidelines on use and management of the water resources in the country. It requires that a water user obtains a permit for various purposes including for discharge of pollutants into any water resource. The act further notes that, the issuance of the permit is subject to public consultation as well as an Environmental Impact Assessment. Water from Tionosoyiet wetland is abstracted for various uses, e.g. by Torot tea Factory.

The Water Act establishes the implementation framework for the Water Policy. The Act does not define 'wetlands' nor does it make any direct reference to wetlands. However, its definition of "water resource" ("any lake, pond, swamp, marsh, stream, watercourse, estuary, aquifer, artesian basin or other body of flowing or standing water, whether above or below ground") clearly encompasses wetlands. Two outstanding features of the Water Act that are of relevance to the discussions about wetlands are, firstly, its streamlining of different functions related to the sustainable management of water resources; and secondly, its provisions of a framework for participation of different stakeholders in the management of water resources. The Act separates policy formulation, water resource management, regulation of water and sewerage services provision and financing and vests these mandates on different institutions. It also devolves decision-making processes to the regional and local levels, thereby promoting stakeholder participation, including that of communities and the private sector. Catchment Area Advisory Committees and WRUAs provide spaces for citizen participation in designing and implementing water resource management initiatives across the country.

## **2.4.3 FOREST ACT 2005**

The Act guides on management and registration of forests. It is supported by the Forests Act of 2005 (No. 7 of 2005) and the Forests (Participation in Sustainable Forest Management) Rules, 2009 Kenya Gazette Supplement No. 754. The objective and purpose of these Rules is to guide on application of authorizations on sustainable use of forests.

Sessional Paper No. 1 of 2007 on Forest Policy introduced significant reforms in the management of forest resources including an ecosystems approach to the planning and management of forests and the involvement of forest adjacent communities and other stakeholders in forest management and conservation. Although it does not specifically address wetlands, the Policy and its objectives have a bearing on the management of wetlands resources. Among its objectives are to promote the participation of the private sector, communities and other stakeholders in forest management to conserve water catchment areas, create employment, reduce poverty and ensure the sustainability of the forest sector. Wetlands have important implications for water catchment. It expands forest management to embrace preservation of religious and cultural sites, traditional medicinal sources, water catchments, and habitats for endemic and threatened species of flora and fauna, categories that no doubt include wetlands.

The implementing legislation for the Forest Policy is the Forests Act, 2005. It too does not specifically deal with wetlands. It establishes the Kenya Forest Service (KFS), the functions of which include, "managing forests on water

catchment areas primarily for purposes of water and soil conservation, carbon sequestration and other environmental services”. It empowers the Minister, upon the recommendation of the forest conservation committee for the area within which a forest is situated, the local authority and the Board of the Kenya Forest Service to declare as a local authority forest any land under the jurisdiction of a local authority that is an important catchment area, a source of water springs, or is a fragile environment; or is rich in biodiversity or contains rare, threatened or endangered species”. These powers can be used to conserve and protect wetlands.

#### **2.4.4 AGRICULTURE ACT CAP 318**

This Act aims to promote and maintain stable agricultural production in the country through conservation of the soil and its fertility and to stimulate the development of agricultural land in accordance with the accepted practices of good land management and good husbandry.

The Agriculture Act (Cap 318) is an old piece of legislation, first enacted in July 1955. It has no direct relevance to wetlands except in so far as they may be affected by orders given to owners and occupiers of agricultural land by the Minister in charge of agriculture for purposes of conserving and managing soil, checking soil erosion and preventing other adverse impacts on land. The Minister may also make land development orders against an owner or occupier of agricultural land requiring the carrying out of specified development programmes within a specified period of time. Although such orders could effectively have a bearing on wetlands management, their objective would be the promotion of good farming methods.

#### **2.4.5 THE WILDLIFE CONSERVATION ACT**

The Wildlife (Conservation and Management) Act provides the framework for protection, conservation and management of wildlife in Kenya. It establishes the Kenya Wildlife Service (KWS) as a uniformed and disciplined force and vests it with oversight of conservation, management and utilization of all types of fauna (other than domestic animals) and flora. Because this Act focuses more fauna and flora, it has no direct relevance to wetlands management, except for the fact that wetlands are often habitat for fauna and flora. Unfortunately, the focus of wildlife conservation in Kenya has traditionally been on the large animals and protected areas and this is what KWS is known for, despite being the Administrative Focal point of Ramsar in Kenya.

#### **2.4.6 PHYSICAL PLANNING ACT 1999**

The Act gives provision for the development of local physical development plans and, it also guides and coordinates development of infrastructure within the county, municipal and town councils. The Act also guides on land use and development. This regulation is triggered as the area is currently mainly under agricultural use with a few institutional and commercial uses. It is therefore recommended that the land use status is reviewed.

#### **2.4.7 PUBLIC HEALTH ACT CAP 242**

The Act provides measures that safeguard and promote public health. The measures considered by the Act include those on prevention of discharge of pollutants into watercourses; prevention of mosquitoes breeding sites, sanitation management among others.

#### **2.4.8 FISHERIES ACT**

This Act guides on the development, management, exploitation, utilization and conservation of fisheries. Section 5 of the Act gives guidelines on fisheries management measures.

It is evident from the foregoing that there are a large number of policies and laws that have a bearing on the conservation and management of wetlands in Kenya, and that there are in existence policy and legal provisions that if enacted and properly used could facilitate the sustainable conservation of wetlands. Unfortunately, this multiplicity of policies and laws also translates into a multiplicity of institutional mandates that often trigger conflict and confusion. A key challenge with this framework, which has implications not just for wetlands but also

for other natural resources, is the issue of coordination. It is clear from the foregoing that apart from EMCA 1999, the policies and laws are sector specific. And although the rhetoric of holistic management is common especially to the more recent policies and laws, the reality of implementation is by reference to specific sectors.

This has remained the key challenge to wetlands management and is the main motivation for the push for policy, legal and institutional framework specific to wetlands resources. It is quite evident that only a framework that has a focus on wetlands can ensure sufficient attention to these resources. But it is also now acknowledged that wetlands and other natural resources have to be managed in a manner that takes into account the interconnectedness of ecosystems. It is for this reason that the design of a policy on wetlands must of necessity involve wide consultations and bring on board stakeholders from a wide spectrum of sectors. Ultimately, what a wetlands policy should seek to do is to articulate principles and values for sustainable conservation and management and to generate buy-in thereon so that different sectoral institutions and to apply the same in their sectors and thereby contribute to the integrity of wetlands.

## **2.4.9 INSTITUTIONAL ARRANGEMENT FOR WETLAND MANAGEMENT IN KENYA**

In Kenya, wetland management is supervised under the National Environment Management Authority (NEMA) deriving this mandate from the environmental law (EMCA, 1999), section 42. A National Wetland Programme is also implemented under the Kenya Wildlife Services (KWS), which at the same time is the Ramsar administrative Authority.

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## **2.5 RATIONALE FOR MANAGEMENT PLANNING**

Management planning is a process of arriving at goals and objectives for managing a given resource in a defined area. A management plan guides the utilisation and management of resources within a given area and specifies the activities that should or should not be carried out or regulated by the various interested parties in specified parts of the planning area. The management plan spells out the roles and responsibilities of all stakeholders in the management process, and the resources needed for implementation of the suggested management actions. A management plan therefore identifies management needs, priorities, approaches and procedures for implementation and monitoring.

The Tionosoyiet wetland system is situated in an area where seasonal and permanent wetlands are being converted into farmland or urbanized development such as for housing purposes. Indeed, the wetland system is already threatened by increasing demand for agricultural land, Eucalyptus tree growing, pollution and encroachment for human settlement and other unsustainable utilisation practices. The low economic status of the surrounding communities has also increased the drive to exploit the wetland and to open up land for crop and livestock farming. Given the above considerations, a wide-scale plan for sustainable management and conservation of Tionosoyiet wetland is necessary. Efforts for conserving the Tionosoyiet wetland system were initiated by the Ministry of Environment and Mineral Resources through LVEMP II to work out ways of ensuring sustainable use of the resources.

This management plan, which specifies what can be done and what cannot be done in different parts of the wetland will contribute towards the wide-scale management needs. Implementation of this management plan is expected to instil confidence and consistency in management, decision-making for the conservation and management of the wetland. It is against this background that the NEMA/LVEMP II has taken the initiative to work with the local communities and users, local authorities and district officials to develop a management plan for Tionosoyiet. This has been seen pertinent, as the wetland is an important natural resource requiring wise use and conservation.

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## 2.6 METHOD OF PLAN DEVELOPMENT

A natural resources management plan can be defined as a set of processes that will help achieve mutually agreed objectives in the management of a resource in a specified area. The Tionosoyiet wetland management plan was formulated through a highly participatory process involving both stakeholders at the national and County levels and in line with Ramsar Convention guidelines, as a tool to guide the promotion of optimal and sustainable use of wetland resources. The plan is in line with Kenya's national policy which provide for sustainable development as per the Constitution of Kenya, 2010. Similarly, the plan is in line with the country's blue print, Vision 2030, under the social pillar which provides for the sustainable management and utilisation of environmental and natural resources. The plan was developed with the full participation of the wetland resource users and other key stakeholders interested in the sustainable management of the wetland system. Emphasis was given to the fact that management plans should be developed within the context of the Ramsar Convention "wise use" concept, based on three key objectives to:

- maintain the integrity of the wetland,
- promote economic benefits,
- Encourage the sustainable use of resources so that present and future generations benefit.

The main goal of this plan is to work out ways of optimizing the use of resources and limiting the problems and conflicts due to resource use, in order to avoid degradation or abuse of wetlands.

The need to involve local communities in the whole process stems from the fact that:

- The local communities' use the resources, most times in uncoordinated ways, and if not well guided can abuse the same resources.
- The local communities are custodians to the wetland resources and if they appreciate their benefits, can be devoted to sustainable management and conservation of the wetland resources.
- The local communities are very knowledgeable about the wetland resources they utilize the pertinent conflicts and associated problems in their respective areas.
- The local communities have detailed knowledge on the key issues and problems associated with the resources and their use.

It is therefore clear that the local communities in the areas surrounding Tionosoyiet are the right people to work out the problems associated with the wetlands and suggest solutions to these problems. Based on this background, the approach used involved facilitating the local communities and other technical stakeholders to share ideas and experiences in resource use, problems and conflicts in the area and working out possible solutions to address the conflicts and problems as they plan to optimize resources use (plate 1). The planning process therefore involved participatory approaches, which brought out ideas from local communities into the plan. Of key consideration was the involvement and participation of the County Government of Kericho and different gender groups to bring out the gender perspectives of the resource uses as well as opportunities for the conservation.

All the community-based wetland management planning meetings were held right from location and sub-county levels with mobilisation efforts from the relevant Extension Officers. In some instances, a local officer, undertook translation in order to aid better understanding of the local issues and exert confidence for effective communication.

**PLATE 2: COMMUNITY CONSULTATIONS (UNDER-TREE MEETING AND WORKSHOP); BELOW HIS EXCELLENCY, THE GOVERNOR OF KERICHO, HON. CHEPKWONY GIVES HIS INPUTS DURING CONSULTATIONS**



## 3.0 TIONOSOYIET WETLAND RESOURCE, PROBLEM AND STAKEHOLDER ANALYSES

A participatory Resources Analysis for the wetland resources was adopted by the facilitators during the meetings. The stakeholders were divided into groups and guided by the following questions

- Identify the available resources in the wetland
- Identify the resource beneficiaries and the user groups by gender
- Outline Resource use trends
- Rank the resources use

Generally, Tionosoyiet provides many essential benefits to the community and act as an important water source for factories located within the neighbourhoods. From their perspective, following uses and benefits of the wetland were noted by communities;

- Water Provisioning for domestic/household usage (drinking, cooking, washings etc), car-washings, cattle watering, agriculture, industrial use (e.g. Torot Tea factory abstract water from this wetland)
- Ecological and biodiversity uses; a home and breeding ground to a number of birds (Adada Ibis, herones), invertebrates, mammals, fish, aquatic (Typha domingensis, sedges, shrubs, floating-leaved water lilies) and non-aquatic plants, insects such as butterflies etc
- Underground water recharge
- Fish- particularly to downstream community members living around the Mjini area (children were seen fishing and mostly catch cat fish, and 'Adel')
- Micro-climate enhancement
- Cultural and religious significance
- Grazing area for livestock

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### 3.1 RESOURCE BENEFICIARIES AND THE USERS GROUPS BY GENDER FOR THE TIONOSOYIET WETLAND ECOSYSTEM:

According to the stakeholders, Tionosoyiet wetland resources are myriad and include:

- Fish (Mud fish, Tilapia)
- Water
- Indigenous trees
- Reeds
- Clay
- Soil for agriculture
- Grass/fodder for livestock

These resources are prioritized and ranked differently based on their perceived importance to the local communities. When the services and goods were ranked during group sessions, water for domestic use topped the list of the many benefits communities derive from this wetland (table 2). In addition, wetland resource trends over the last 3 decades have changed. Generally, the quality and quantity of resources such as water and vegetation cover of the wetland ecotone has been decreasing with increasing population over the past years. Similarly, the adverse effects and implications of poor practices such as soil erosion is on the increasing trend, pointing out to the need to have a management plan to avert this worrying trend (table 3)

**TABLE 2: WETLAND RESOURCE RANKING**

WETLAND RESOURCE	RANK
Water for domestic use	1
Water for livestock	2
Fish farming	3
Cultivation	3
Grazing	4
Bee keeping	5
Cultural functions- circumcision, cultural prayers, curses	6
Clay and soil for smearing, crafts and brick making	7
Recreation	8
Baptism	9
Harvesting reeds	10

**TABLE 3: RESOURCE USE TRENDS**

PARAMETERS/YR	1970'S	1980'S	1990'S	2000'S	REMARKS
Quality of water in the streams	5	5	3	2	Urbanization, increased deforestation
Quantity of water	5	4	4	2	Deforestation, climate change, industrialization, eucalyptus, industrialization
Rainfall amount	5	4	3	3	Population pressure, climate change, deforestation, industrialization
Population	2	2	4	4	Demand for firewood and timber,
Soil erosion	2	3	4	5	Deforestation, population increase, farming, infrastructure
Vegetation cover	5	4	3	2	Encroachment, population increase, poor farming methods

## 3.2 A GENDER PERSPECTIVE OF THE TIONOSOYIET WETLAND RESOURCE USES

Communities were able to divide the wetland into sections from upstream through to downstream areas. They also have specific local names attributed to the different sections/segments of the riverine wetland across the river continuum. The local names enabled them to understand and appreciate the resources at their local-contexts and the their interactions with the wetland (resources). Tionosoyiet wetland resources and their exploitation follow distinct gender patterns; men and women, boys and girls derive important elements of resources from the wetland (table 4), pointing out the need for gender mainstreaming in plans and programmes within this catchment.



## DOCUMENTING COMMUNITY VOICES:

1. “God gave us enough water and rainfall but we have persistently degraded the wetland. We have tried to sink boreholes but they are not safe, replaced indigenous trees with blue gum that has continued to decrease the water level. This is the time to do something. The water from this wetland has been very clean, crystal-clear and portable” Sarah Mutai, a resident of Chepsetiom village-Kericho Town location.
2. “We have realized that water levels in this wetland are going down because of eucalyptus trees which consume a lot of water. We old women are suffering and have difficulty in drawing water from the river” Pricila Rono (60), Chepsetiom village.
3. “When the planting of blue trees started, we thought the problem of lack of fuel-wood would stop. Little did we know that this tree would be disastrous and consume a lot of water but we need to move very fast and swiftly to salvage the situation by removing the eucalyptus trees and replacing them with indigenous trees along the riparian zones of the wetland so that more water can be available for us to draw”. Rachael Rono, Chepsetiom village

**TABLE 4: TIONOSOYEIT WETLAND RESOURCE USE BY GENDER**

**KEY: F- ADULT FEMALE; M- ADULT MALE; Y- YOUTH;**

<b>WETLAND (SECTION) NAME</b>	<b>BENEFITS/ FUNCTIONS</b>	<b>USER GROUP BY GENDER(GROUP)</b>
Chemugusu	Domestic use, Reed (Saoset) for thatching, clay for smearing houses and for crafts in schools	F,M,YF,YM,
Kibarao	Reeds (Saoset) for thatching and purification of the water, water for domestic use, source of the Tionsioyiet, breeding home for cranes (Kong’onyot), Fishes (Tilapia and Mud fish)	F,M,YF,YM
Sugutek (joins Chemugusu)	Water for domestic use, trees for traditional medicine	F, M, YF, YM
Ainabelek (River of Elephants)	Water for domestic use, reeds for cultural use and thatching	F,M,YM
Chelagon	Water for domestic use	F,M,YF,YM
Kimungen	Water for domestic use, cattle dip use, fish ponds	F,M,YF,YM
Kipkeles	Water for domestic use, reeds for thatching, quarrying, fish ponds, tree nurseries	M,F,YF,YM
Munyak	Water for domestic use, fish ponds, bee keeping, circumcision site	M,F,YF,YM
Melit (Kiplimo)	Water for domestic use, irrigation, fish ponds, Hydro electric power	M,F,YF,YM
Ainaptindinyek	Water for domestic use, car wash, horticulture, clay for smearing houses and making bricks	M,F,YF,YM
Chepnabe	Water for domestic use, car wash, baptizing, source of Tionsioyiet, reeds for thatching, clay for smearing houses and school crafts	F,M,YF,YM
Ainaptaiywet	Feeds Tionsioyiet, water for domestic use, reeds for thatching	M,F,YF,YM
Kondamet	Water for domestic use, reeds for thatching	M,F,YF,YM
Birirbei	Water for domestic use, , fish ponds, irrigation	M,F,YF,YM
Taiywet	Water for domestic use, fish ponds, reeds, exotic and indigenous trees(firewood and medicine), cattle dip, Stevia plants by Pure circle, Kenya, initiation site, clay for smearing and crafts, baptism, car wash, irrigation	M,F,YF,YM, Church

### 3.3 PROBLEM ANALYSIS

The Tionosoyiet wetland degradation was analysed through cause-effect approach. The stakeholders are concerned by need to preserve wisely-use and protect the wetland sources, locally referred to as KONDAMET. For this management plan, their fears resonated around lack of capacity (skills, knowledge and financial resources) in order to understand the issues, legislations and carry out enforcement actions at their level; women are more worried about the decreasing water levels in the riverine wetland and the quality therein, which they partly attribute to planting of eucalyptus trees within the wetland area; extreme weather conditions marked by low/depressed rainfall regimes and droughts; aquaculture development (triggered by the Economic Stimulus Programme-ESP); plastic waste; unsustainable agriculture manifesting itself in form of farming in the riverbanks; lack of appropriate cattle watering points; car-washing and pollution from Kericho sewerage and through direct bathing, domestic washings etc; and inadequate grazing areas/pasture lands among others. All these have negative consequences on the wetland as well as the livelihood and well-being of the communities dependent on this wetland. A participatory cause-effect analysis of the problems is presented in Table 5.

Generally the problems and threats facing Tionosoyiet wetland can be grouped into six viz;

- Inadequate capacity (human skills/knowledge and equipment/infrastructure) and awareness
- Water Pollution and waste management challenges
- Catchment modification or/and degradation
- Unsustainable agriculture (livestock, fish and crop farming)
- Socio-cultural rigidities limiting livelihood diversification
- Alien and invasive species and inadequate research and monitoring

**TABLE 5: THE CAUSES AND EFFECTS ASSOCIATED WITH THE DEGRADATION OF THE TIONOSOYIET WETLAND**

PROBLEM	CAUSE-EFFECTS	COPING STRATEGIES
Blue gums	Low water quantity and quality	Planting indigenous trees
Over grazing	Soil Erosion, low vegetation cover	Tethering /restricted grazing
Pollution	Water borne diseases, low water quality	Water treatment at the household level
Over population	High population growth rate; socio-cultural landscape	Do-nothing
Sewage burst	Pollution, quality of water, water borne diseases	Water treatment; do-nothing
Industries	Pollution, localised temperature rise/warming, reduced quality of water	Water treatment; planting trees; trainings
Poverty	Decreased living standards, increase in diseases, pollution due	Diversified income streams from other sources e.g. undertake steva farming
Reduction of water levels	Human activities e.g. poor farming strategies, deforestation, planting of eucalyptus, encroachment	Afforestation, capacity building
Contaminated water	Blocked sewerage systems, disposal of wastes in water	Improved ways of wastes disposal
Reduction of forest cover	Negative human activities- cutting of indigenous trees, charcoal burning	Afforestation, capacity building
Increased proliferation of eucalyptus trees	Negative human activities- high demand for timber and firewood	Afforestation especially of indigenous trees
Soil erosion	Negative human activities- cultivation along the banks, poor drainage systems along the roads; Over population, over grazing, siltation	Afforestation, improved drainage systems

Ignorance	Lack of knowledge on how to conserve the environment and its importance	Awareness creation and capacity building
Deforestation	Food insecurity, charcoal burning, increased timber demand	Reafforestation, agro forestry, bio- fuel projects
Pollution	Untreated effluents discharge, industrial water (oil spillage), car wash	Septic tanks, proper drainage
Habitat loss	Pollution, agricultural and other human activities	Restocking (fish), proper wastes disposal

## 3.4 OBJECTIVE ANALYSIS AND PARTICIPATORY VISION DEVELOPMENT

Participatory objective analysis and vision development are key elements in a community-based wetland management planning process. In this case, communities were guided using an objective tree to analyse the specific and concrete objectives that the plan seeks to address based on the results of the problems mentioned above. In addition, at group level, participants were tasked to come up with concise statements that set out what they would wish to ‘see’ once the management plan and interventions are implemented - the vision. These were harmonized at the plenary stage and consensus reached. Thus the strategic objectives for the Tionosoyiet wetland management plan include to:

- Promote catchment management
- Control water pollution and solid waste management
- Control and manage alien and invasive species
- Improve food security and community adaptive capacities
- Build communities’ capacities , awareness and resilience towards sustainable wetland management
- Promote participatory researches, impact monitoring and evaluation
- Improve water access and availability

The adopted vision for Tionosoyiet wetland is “*A sustainable managed Tionosoyiet wetland ecosystem with desired biodiversity that support community livelihoods*”.

## 3.5 STAKEHOLDERS’ IDENTIFICATION AND ANALYSIS

The first step towards stakeholder analysis, was to list down all the stakeholders (overt and covert), their roles, whether they are key or marginalised. The stakeholders were therefore re-grouped into five’s in order to come up with such a list. At the plenary, the list was harmonised and consensus built on the said stakeholders, their mandates/interest and importance. Generally there many stakeholders with different stakes/interests including;

- ✓ Families (Men, women, boys and girls)
- ✓ Farmer(groups) eg tea and maize
- ✓ Water vendors
- ✓ Fisherfolk
- ✓ Ketepa
- ✓ James Finlays

- ✓ Sanik Bakery
- ✓ KEWASCO
- ✓ Purecircle
- ✓ Carwashers
- ✓ Unilever
- ✓ KTDA
- ✓ Finmax
- ✓ Ministry of agriculture,
- ✓ Ministry of Environment,
- ✓ Ministry of Forestry,
- ✓ Ministry of Roads,
- ✓ Ministry of Water,
- ✓ Ministry of Fisheries,
- ✓ Ministry of lands,
- ✓ Ministry of Public health,
- ✓ NEMA
- ✓ KEFRI
- ✓ KFS
- ✓ KWS
- ✓ KARI
- ✓ WRMA
- ✓ WRUAs
- ✓ Waste collectors
- ✓ Abattoir
- ✓ Hospitals
- ✓ House Construction companies
- ✓ CSOs (NGOs and CBOs)
- ✓ Church e.g. Catholic Diocese of Kericho/FBO
- ✓ Culture custodians
- ✓ Municipal Council
- ✓ MPs, and Councillors
- ✓ Provincial Administration
- ✓ Ministry of Livestock
- ✓ Ministry of planning
- ✓ Ministry of gender and social development
- ✓ Schools

Based on the aforementioned list, the stakeholders were analysed using the stakeholder matrix based on their relative importance and influence (table 6).

**TABLE 6: STAKEHOLDER ANALYSIS MATRIX**

<p><b>A) HIGH IMPORTANCE &amp; LOW INFLUENCE</b></p> <ul style="list-style-type: none"> <li>• Women</li> <li>• Farmers</li> <li>• Water vendors</li> <li>• Fishermen</li> <li>• Culture custodian</li> <li>• KETEPA</li> <li>• UNILEVER</li> <li>• KTDA</li> <li>• FINMAX</li> <li>• Car washers</li> </ul>	<p><b>B) HIGH IMPORTANCE &amp; HIGH INFLUENCE</b></p> <ul style="list-style-type: none"> <li>• NEMA</li> <li>• Ministry of Environment, Water and natural Resources</li> <li>• Ministry of roads</li> <li>• Min. of agriculture, Livestock and Fisheries</li> <li>• Ministry of public health</li> <li>• Ministry of lands</li> <li>• Environmental activists</li> <li>• Ministry of Interior Coordination</li> <li>• County Government</li> <li>• KFS</li> <li>• KWS</li> <li>• Ministry of planning</li> <li>• WRMA, WRUA</li> <li>• Construction companies</li> <li>• KEFRI</li> <li>• KARI</li> <li>• Schools</li> <li>• James Finlays</li> </ul>
<p><b>C) LOW IMPORTANCE &amp; LOW INFLUENCE</b></p> <ul style="list-style-type: none"> <li>• Politicians (MP's , Councillors)</li> <li>• Donors</li> <li>• NGO's</li> <li>• Schools</li> <li>• Churches</li> <li>• Investors (Pure circle Kenya</li> <li>• Hospital</li> </ul>	<p><b>D) LOW IMPORTANCE &amp; HIGH INFLUENCE</b></p> <ul style="list-style-type: none"> <li>• Catholic Diocese of Kericho (FBO)</li> <li>• Kericho Municipality Environmental Group</li> <li>• Live with hope centre</li> <li>• Local urban/ slum dwellers</li> <li>• Farming managers in the Diaspora</li> <li>• Politicians, (MPs and councillors)</li> <li>• Guru Nanak</li> </ul>

Stakeholders in the pink box B (with high importance and high influence) must be involved in the planning and implementation of the management plan while those in box C shall just be monitored as they may not have much influence / and power and also less important in the management planning/decisions making.

# 4.0 TIONOSOYIET WETLAND MANAGEMENT ISSUES AND IMPLEMENTATION PLAN

A diverse series of issues need to be addressed in order to effectively manage the Tionosoyiet wetland. The management objectives described in section 3.4. The proposed interventions, actors and budgets for the management of this wetland are summarized in table 7.

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**PLATE 3: OTHER PARTS OF THE WETLAND**



**TABLE 7: TIONOSOYIET WETLAND IMPLEMENTATION PLAN**

STRATEGIC OBJECTIVE	ACTIVITIES/PROGRAMMES	TIME FRAME	RESPONSIBILITY/ ACTOR	BUDGET (IN MILLION KSHS)	INDICATORS
To control water pollution and solid waste management	<p>Establish formalised bathing, laundry, cattle watering and car-washing areas and community structures/institutions for managing such;</p> <p>Encourage organic farming in the agricultural fields;</p> <p>Establish sedimentation basin/pollutant trap;</p> <p>Create awareness on pollution prevention and the impacts;</p> <p>Establish Integrated Solid Waste Management (ISWM) programmes through a public private partnership (PPP) framework involving active participation of youth and women groups;</p> <p>Establish germ-plasm and vegetation for river bank protection;</p> <p>Ensure households have adequate and functional waste management structures such as pit latrines/sock pits that do not directly discharge into the wetland;</p> <p>Provide Sewerage networks and treatment systems for human wastes;</p> <p>Encourage safe use of waste and wastewater as fertiliser in agriculture or for biogas production;</p> <p>Reduce livestock capacity ;</p> <p>Encourage Zero grazing;</p> <p>Promote Waste segregation;</p> <p>Establish designated dump sites for industrial and domestic solid and liquid waste;</p>	October 2014-December 2018	County Government, KEWASCO, NEMA, KARI, KFS, Community, WRMA, CFAs, WRUAs, Interior Coordination/administration, schools, Universities, KEWI, Ministry of Agriculture and Livestock; Car washers; Wetland Committee, industrialists (e.g. Torot tea factory, James finlays etc)	150	Improved water quality; monitoring reports, functional committees, acreage planted with trees/vegetation; number of households with pit latrines; training reports, functional sewer networks, number of initiatives on ISWM and income/revenue accruing,

STRATEGIC OBJECTIVE	ACTIVITIES/PROGRAMMES	TIME FRAME	RESPONSIBILITY/ ACTOR	BUDGET (IN MILLION KSHS)	INDICATORS
To Promote catchment management	<p>Establish tree nurseries;</p> <p>Mount indigenous/suitable tree planting campaigns within the catchment to rehabilitate degraded catchment areas including bamboo;</p> <p>Undertake Wetland zoning and boundary delineation;</p> <p>Encourage Contour ploughing;</p> <p>Plant /establish adequate cover crops;</p> <p>Carry out Participatory Catchment and sub catchment Management Planning;</p> <p>Monitor plan and animal species population assemblages as ecological indicators of change;</p> <p>Encourage trade-offs e.g. replacing trees with those extracted for firewood;</p> <p>Discourage agricultural activities within wetland riparian areas through by-laws and enforcement of national laws;</p> <p>Control tree harvesting and encourage sustainable charcoal production- implement the Sustainable Charcoal Production Regulation;</p> <p>Develop appropriate land use plans (LUPs) to discourage proliferation of unplanned and informal settlements and unsustainable land subdivision.</p>	2014-2018	County Government, Ministry of Lands, Ministry of Agriculture, NEMA, KFS, Research institutions, KEFRI, WRMA, WRUA, NGOs, Private sector; Wetland committee; administrations/ministry of interior coordination;	45	Rehabilitated catchment; Existence of tree nurseries; area vegetated; existence of SCMPs, LUPs reports/Minutes; biodiversity assessment report; water quality data and trends
To Control alien and invasive species	<p>Monitor the food chain and support studies of raptors etc;</p> <p>Protect sensitive areas e.g. breeding, nesting and feeding areas;</p> <p>Monitor alien and invasive species behaviour and ecology and their impacts;</p> <p>Physically, biologically or chemically control such species</p>	2014-2018	County Government, Ministry of Agriculture and Fisheries, Livestock, KFS, KARI, KEFRI, KEMFRI, NEMA, KWS, Universities, NGOs, Wetland Committee	38	Monitoring reports/minutes; existence of protected areas and by-laws/rules; area/size controlled; populations of alien and invasive species



STRATEGIC OBJECTIVE	ACTIVITIES/PROGRAMMES	TIME FRAME	RESPONSIBILITY/ ACTOR	BUDGET (IN MILLION KSHS)	INDICATORS
To Improve food security and community adaptive capacities	<p>Encourage family planning methods;</p> <p>Diversify livelihood and income generation activities; (e.g. encourage Zero-grazing and use of Biogas plants; Sorting of solid waste; Beekeeping; Dairy Goat farming; poultry; Tilapia); Horticulture; Car-washing points; Tea seedling /nursery; Eco-tourism/biodiversity conservation; Bottling water for sale; Improved cooking stoves/Energy saving jikos);</p> <p>Zoning for various uses (Religious, cultural, car wash, drinking water, livestock, grazing, ecotourism) ;</p> <p>Trainings on value addition and livelihood improvements;</p> <p>Encourage women and youth's participation in conservation and link them to micro-financiers;</p> <p>Heighten awareness and education campaigns to break social rigidities and retrogressive socio-cultural practices e.g. on land tenure/ ownership;</p> <p>Encourage rainwater harvesting and storage;</p>	2014- December 2018	<p>County Government, Ministry of Agriculture, Livestock and Fisheries, Ministry of Gender and Social Development, Ministry of Planning; NEMA, KFS; WRMA; KMFR; Private sector (water bottlers); Ministry of Environment;;</p> <p>NGOs, Private sector; Women and Youth groups; Wetland committee</p>	87	<p>Number /uptake of appropriate FPM; Diversified and number of livelihood options and enterprises; training reports and minutes; existence of rainwater harvesting and storage structures; livelihood enterprises,</p> <p>Zoned areas, income and food tonnages derived; training reports;</p>
To Build capacity through trainings and create awareness	<p>Conduct community-level trainings on wise-use and Integrated Wetland-Watershed Management (IWWM) &amp; Ecosystem-Based Integrated water Resources Management (IWRM); ISWM;</p> <p>Catchment management and rehabilitation;</p> <p>Gender and climate change; ad hoc/walk in awareness and formalised awareness raising campaigns on family planning e.g. on radio fm stations; organize exchange visits for learning and experiential sharing; Value addition techniques; ecotourism and biodiversity conservation; water pollution control and management; safe use of human, animal waste and wastewater</p>	2014-2018	<p>WRMA, NEMA, KFS, Ministry of Energy, Ministry of Agriculture, Livestock, Fisheries, KWS, NGOs; County Government;</p>	15	<p>Training reports; attendance schedule; number of exchange visits organized;</p>

	<p>Conduct education campaigns for adoption of safe use of treated waste and wastewater re-use to demystify final products uptake and sale;</p> <p>Establish constructed wetlands for wastewater treatment (from car-wash, storm drains, bathing etc) and improvement before final discharge into the wetland;</p> <p>Mount studies and research including monitoring water quality (design models) for various uses;</p> <p>Establish lines of communication with market hawkers Association to limit amount of plastic waste and other gross pollutants into the wetland e.g. initiate transformation such as from waste to wealth, plastic to petrol (P2P);</p> <p>Enforce environmental laws regarding water pollution;</p> <p>Reroute the sewer line to other non/less populated;</p> <p>Expand the capacity of sewer network to cater for increasing population and use durable materials;</p> <p>Carry out regular surveillance and check for Environmental auditing(annually) for existing industries;</p>				
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STRATEGIC OBJECTIVE	ACTIVITIES/PROGRAMMES	TIME FRAME	RESPONSIBILITY/ACTOR	BUDGET (IN MILLION KSHS)	INDICATORS
Improve water access and availability	<p>Develop suitable incentives for water use and access methods;</p> <p>Establish permanent water level monitoring, rainfall and stream inflows and outflows;</p> <p>Enforce water rules 2007 and/or by-laws;</p> <p>Establish subcommittees on to regulate water access and use points;</p> <p>Encourage water wheel device Archimedean screw pump driven by flow for formalised stock watering point;</p> <p>Remove blue gum trees within and around wetland area; establish appropriate area for car washing and design infrastructure for such</p>	<p>January 2013-December 2014</p>	<p>Communities, Wetland Committee; WRMA, WRUAs, Provincial Administration, NEMA, Car washers; NGOs,</p>		<p>Established water access and use points; water subcommittee; rules/by-laws formulated; area covered by blue gums that is removed; car washing relocated;</p>
To Promote Participatory Research, information sharing and monitoring	<p>Conduct integrated researches on water balance; ecology/biodiversity and ecotourism potential; socio-economic linkages to ecology/modifications and changes; land use and land cover changes (LULUC); participatory feedback channels (fora)/information sharing and establish monitoring and evaluation plan/frameworks</p>	2014-2018	<p>Universities, Researchers; KARI, KMFRI, NGOs, County Government; NEMA; KWS, WRMA, KFS; Ministry of Land, Ministry of Agriculture; Wetland Communities;</p>	57	<p>Research findings/reports; meeting minutes/ workshop proceedings; existence of M and E plan; M and E reports</p>

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## 4.1 MONITORING AND EVALUATION

This is key to track the socio-ecological changes and restoration of the ecological integrity of the ecosystem.

### OBJECTIVES

The main objectives of a monitoring programme will be to provide information that will:

- Monitor changes in water quality;
- Establish trends and allow forecasting of wetland buffering capacity that would aid in understanding the wetland ecosystem and water budget, and how these are affected by environmental factors and human activities;
- Establish reasons for changes in the vitality of the Wetland and its environs;
- Update and measure the success of the Management Plan.

### PARAMETERS TO BE MONITORED

Physical parameters to be monitored are to include but not limited to:

- climatic elements - rainfall, evaporation, humidity, air temperature, wind speed and wind direction, these should be sought from the James Finlay ARD;
- stream flow and wetland water levels trends;
- wetland water quality;
- endemic and invasive species both plants and animals
- wildlife and bird censuses;
- health of species at the different levels through the food chain;

### SOCIO-ECONOMICS:

- Health statistics, particularly for malaria and gastrointestinal diseases;
- Level of awareness and understanding of management issues;
- Compliance by the community and stakeholders with the Management Plan;
- Development of new catchment activities.

### REVIEW OF THE MANAGEMENT PLAN

The Management Plan is intended to be dynamic, constantly changing as fresh knowledge becomes available. In updating the Plan the Management Committee will:

- assess whether the operational objectives are being achieved;
- examine whether the implementation plan is on track;
- evaluate the implementation team;
- evaluate the cost-effectiveness of the implementation process;
- evaluate the validity of previous assumptions in the light of monitoring results;
- evaluate public opinion on the Plan;
- Evaluate the status of the watershed.

## MEASURES OF SUCCESS

The main parameters by which the success of the Management Plan will be measured include:

- status of water quantity and quality;
- status of biodiversity;
- community awareness and support for management issues and the Water Management Committees;
- donor interest and levels of funding;
- quality and usefulness of research;
- quality of the watershed;
- Local community development.

## IMPLEMENTATION

The Final management plan will be handed over to the Plan Implementation Committee (PIC) for review, amendment and implementation.

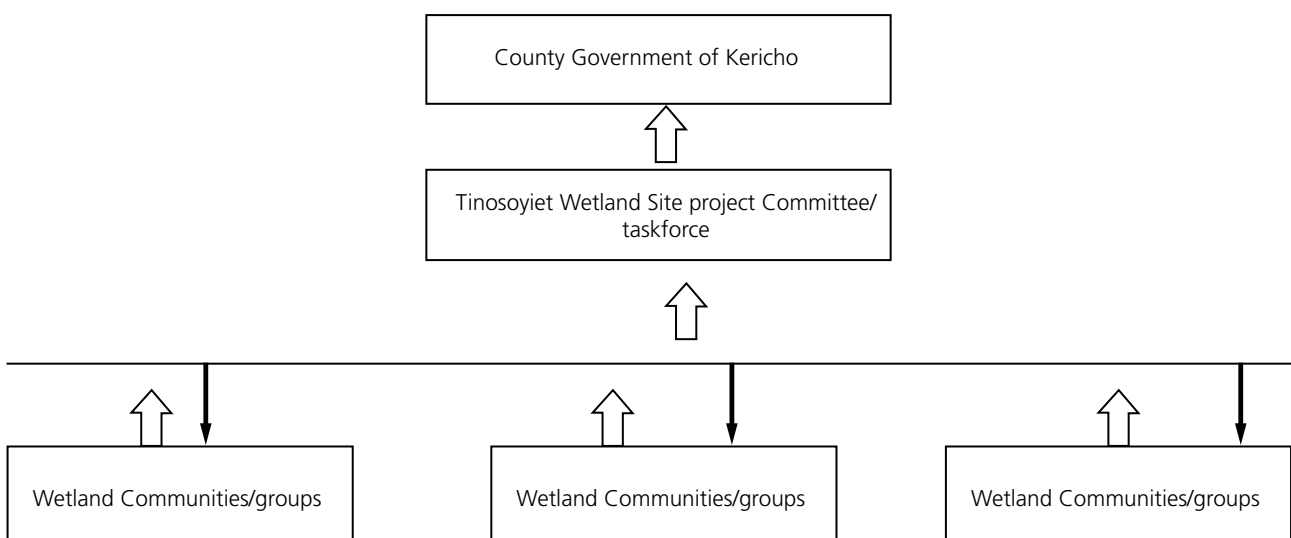
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## 4.2 INSTITUTIONAL STRUCTURE FOR THE IMPLEMENTATION OF TIONOSOYIET WETLAND MANAGEMENT PLAN

The institutional structure described herein provides the framework for accountability and a mechanism for conflict management arising from the use of the wetland. New institutions and alignments of the old ones may take place during the implementation of this management plan. For instance, the current District Project Technical Committee (DPTC) described in this plan is likely to change to County Project Technical Committee (CPTC) in line with the devolve governance as required by the Constitution of Kenya 2010. In spite of this dynamic, this proposed institutional structure (Fig 2) sets the stage for reporting and conflict management. Other structures and mechanisms will evolve and may be set up as need a rises.

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**FIGURE 2: INSTITUTIONAL STRUCTURE/Framework for Managing TIONOSOYIET WETLAND**



# BIBLIOGRAPHY

Ramsar Convention 1971 *www.ramsar.org*

Convention on Biological Diversity (CBD): *www.cbd.int*

United Nations Framework Convention on Climate Change (UNFCCC): *www.unfccc.int*

United Nations Convention to Combat Desertification (UNCCD): [www.unccd.int](http://www.unccd.int)

*East Africa Community: www.eac.int*

GoK, 2008): Nyando District Development Plan 2008

National Land Policy 2009

National Land Act

Kenya Vision 2030

Forest Act 2005

Wildlife Conservation and Management Act 2014

Agriculture Act Cap 318

Fisheries Act

Public Health Act cap 242

Water Resource Management Rules 2007

Physical Planning Act 1998

Constitution of Kenya 2010

Environment Management and Coordination Act 1999

Environment Management and Coordination (Water Quality) Regulations, 2006

Environment Management and Coordination (Wetlands, River Banks, Lakeshore and Seashore Management) Regulations, 2009

Environment Management and Coordination (Environmental Impact Assessment and Audit) Regulations, 2003

Environment Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006

Water Act 2002

Draft Wetlands Conservation and Management Policy 2013

Draft National Environment Management Policy 2013





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