

**REPORT TO THE GOVERNOR
COUNTY GOVERNMENT OF NAKURU**

ON

**SUSTAINABLE MANAGEMENT OF LAKE NAIVASHA
RIPARIAN LAND**



**SUBMITTED BY THE CHAIRPERSONS OF THE TEN COMMITTEES
ESTABLISHED BY THE GOVERNOR DURING THE STAKEHOLDERS
CONSULTATIVE MEETING HELD ON 4TH DECEMBER 2013 AT SIMBA
LODGE- NAIVASHA**

DECEMBER 2014

SUSTAINABLE MANAGEMENT OF THE LAKE NAIVASHA RIPARIAN LAND

EXECUTIVE SUMMARY

Riparian Land

Lake Naivasha riparian Land in accordance with the relevant laws and gazette notices is all that land contained within the 1,892.8m.a.s.l contour within the lake basin, which may from time to time be exposed by receding lake water levels. (Ref. groups 2, 3 & 10)

Riverine riparian land within the lake Naivasha basin in accordance with relevant legislation and as agreed by consensus is a corridor down each bank of the river measuring from each bank a distance equivalent to the width of the river provided always that this should be a minimum of 6mts. and a maximum of 30mts. (Ref. group 3)

Spring riparian land within the lake Naivasha basin in accordance with relevant legislation and as agreed by consensus is a minimum radius of 3mts. and a maximum of 6mts. from the 'eye' of the spring being taken as a mid-point of the area of ground over which is surfacing. (Ref. group 3)

All riparian land is Public land which is incapable of alienation or attracting title, and the custodianship of which is variously and jointly the responsibility of government (both national and county), appointed agents, the local authority, contiguous land-owners, through LNRA, and the general public. (Ref. groups 2, 3, & 10)

Recommendation for way forward:

All riparian land to be pegged according to surveyed trig points to ensure easy awareness of riparian boundaries by all contiguous land owners, monitoring agents, and enforcement officers. (Ref. groups 1,2,3, & 10)

1. PUBLIC ACCESS CORRIDORS

Physical planning maps and Survey of Kenya maps identify 5 access corridors (Ref. Group 1):

- Lentolia (disputed by adjoining landowners)
- Kamere
- Kihoto
- YMCA (intended for wildlife access but land allocated). Ref. Group 10.
- Naivasha Country Club (stated to be a private access and a nearby corridor in the vicinity of Yellow Green lodge mentioned). Ref. SH -chair group 10)

Reference was made to a list 17 corridors alleged by various stakeholders to be existing. A consensus was reached that passages in the Kongoni and Kasarani areas currently being used for access should be established as corridors. (Ref. group 1)

Recommendations for way forward:

- The Government to formalise and gazette corridors at Kongoni and Kasarani. (Ref. group 1).
- Relevant institutions or agents to undertake an exercise of validation of any other claims to access corridors, and recommend relevant steps to be taken (Ref. group 1).
- Watering points for livestock to be developed outside riparian land (ref. groups 1, 2, & 3)
- Public land to be identified outside riparian land where livestock can be permitted to graze (Ref. Group 1).

2. ENCROACHMENT OF AND ON RIPARIAN LAND

The following were identified as encroachments of and on riparian: (Ref groups 2, 3, 4, 5, 6, 7, 8, &10)

- Alienation of riparian land
- Destruction of natural riparian land vegetation
- Planting of trees especially exotic species
- Grazing and watering of cattle.
- Cultivation
- Fencing - other than along riparian zone boundaries
- Building of structures
- Waste and sewage disposal
- Conducting of tour groups on walks.
- Mining of soils and collection of other materials
- Construction of bunds or dykes.
- Constructed wet-lands

Recommendations For Way Forward: (Ref. groups 2, 3, 4, 5, 6, & 8)

- Relevant institutions or agents to prepare a full inventory of encroachments.
- Enforce surrender of illegal titles or any other alienation.
- Decommission and remove all materials of structures on riparian land, at the expense of the parties responsible for such illegal developments.
- Remove all waste material dumped on riparian land at the expense of those responsible.
- Level all bunds and dykes.
- Promote public education, awareness and sensitization on policies, laws and regulations that govern riparian land.

3. SUSTAINABLE USE OF RIPARIAN LAND.

By consensus sustainable uses of riparian land were identified as: (Ref. groups 2, 3, 8, and 10)

- Watering of livestock form traditionally established watering points to be permitted for the time being only pending development of watering points outside riparian land.
- Preservation of vegetation in its natural state
- Eco-tourism to be restricted to boating activities only for purposes of bird, wildlife, & flora viewing and for sporting and recreational purposes. All embarkation and dis-embarkation

points to be appropriately sited and approved by the relevant authority. All boats to be certified by the by the Kenya Maritime Authority.

- Water abstraction with the approval of the appropriate authority, and regulated as necessary
- Fishing from approved beaches and landing-sites provided that whether commercial or sporting the fishing activity is licensed.
- Recreation and site-seeing by the general public over and through the public access corridors, provided always properly regulated.

Recommendations for way forward:

- County government and relevant support institutions or agents, NGOs and CBOs to enhance capacity to ensure compliance and penalize transgressors.
- Local authority and/or agents to manage & regulate all public access corridors.

4. FISHERIES MANAGEMENT.

The fish in Lake Naivasha should be a sustainable resource and source of good livelihood for the commercial fishermen and to provide a good protein source for many more people. (Ref. Groups 4, 3, 8).

The following constraints were identified:

- Inadequate capacity of Fisheries Department to regulate and enforce fisheries management measures
- Lack of awareness, information and capacity among stakeholders
- Reduced productivity due to the lack of market access, value addition, diversification, and aquaculture development.
- Lack of applied research in Fisheries management
- Invasive flora - water hyacinth, duck weed (Azolla)
- Invasive fish species such as crayfish and common carp

Recommendations for way forward:

County government should enhance the capacity of the Fisheries Department by increasing the number of patrol boats, vehicles, and enforcement officers so as to deal with the problem of illegal fishing

5. SEWERAGE AND SANITATION MANAGEMENT.

The problems all relate to lack of adequate treatment work facilities and improper planning and development allowing storm water drainage onto riparian land. (Ref. group 5).

Recommendations for way forward:

Review county by-laws (urban development) to ensure proper sewerage, solid waste, and storm water management. This will likely require the redesign and expansion of the municipal treatment works. The sub-county government should ensure that all building plans incorporate the construction, to required standards, and proper management of septic tanks and soak pits.

The PHD, county authorities, civil society organisations, and property owners to undertake public education and awareness campaigns. (Ref. group 5)

6. POLLUTION

The sources and types of pollution were identified as:

- informal settlements and attendant hospitals, mechanical garages, learning institutions, local markets, human waste, e-waste
- Fish landing beaches
- Agricultural effluents - soil erosion, cattle waste, fertilisers, pesticides, plastic, rubber and metal waste
- Urban storm water run-off.

RECOMMENDATIONS FOR THE WAY FORWARD:

Develop Codes of Conduct for self-regulation, ensure regulatory framework and develop capacity to improve enforcement and compliance on pollution management. (Ref. group 6)

7. VEGETATION DESTRUCTION

It was agreed that vegetation destruction leads to loss of buffering capacity for filtration and for preventing run-off of contaminants such as nutrients and chemicals resulting in lake water pollution. This in turn leads to loss of habitat, biodiversity, and ecosystem functions. (Ref. Group 7)

Recommendations for way forward:

Encourage land owners to undertake restoration of degraded vegetation and enhance capacity of KFS to ensure enforcement and compliance to the laws and regulations governing vegetation on riparian land. (Ref. group 7)

8. SECURITY

It was established that regular cases of insecurity and infringements or attacks on or against environmental assets, infrastructure, property, and individuals are negatively impacting environmental sustainability and development in the region. (Ref. group 8)

Recommendations for the way forward:

Develop a coordinated security enforcement strategy through stakeholder participation in formulation/implementation of security by-laws and codes of conduct at the sub-county level. Thereby ensuring that security alerts, information and reporting amongst institutions and stakeholders are properly and adequately addressed.

Lobby for greater central government budgetary allocation to enable the capacity to address all security issues.

Promote employment, income generating and livelihood opportunities in the informal settlements around the lake of Kamere, Karigita, Kasarani, KCC and Kihoto. (Ref. group 8)

9. WEAK ENFORCEMENT OF WATER LAWS AND REGULATIONS

The problems were identified as being the weak institutional capacity of WRMA and the WRUAs to discharge their mandate thereby resulting in poor enforcement of and compliance with water resource management regulations and inadequate data and information management to guide decision making. (Ref. group 9)

Recommendations for the way forward

WRMA headquarter to enhance the capacity of the Naivasha sub-regional office and the WRUAs, and to honour the agreements and MoUs with WRUAs to facilitate water resource management by the WRUAs

WRMA to establish appropriate data, communications and information management systems to ensure finalisation of water abstraction facts to guide permitting, monitoring and enforcement. (Ref. group 9)

10. WILDLIFE CONTROL AND MANAGEMENT

It was established that despite being a Ramsar site and an Important Bird Area, bird and wildlife habitats are threatened and face degradation through uncontrolled poaching, illegal livestock grazing and human interference. In addition threats are posed by unsustainable tourism practices on riparian land and lack of integrated urban planning for Naivasha town.

Recommendations for the way forward

The riparian zone should be maintained in its natural state to serve as a wildlife habitat and bird breeding area with wildlife populations being maintained within appropriate thresholds to prevent habitat destruction, by allowing wildlife corridors to be kept open and properly monitored.

Land bridges be built over irrigation canals, and fences and buildings removed from riparian land to allow wildlife free movement on the riparian zone.

The riparian zone to be gazetted as a wildlife conservancy or sanctuary to be managed by the local stakeholder community in partnership with KWS.

The proposed wildlife corridor connecting Hell's Gate National Park to Nakuru National Park through the riparian zone be brought to fruition as a dispersal area for, particularly, excess buffalo.

Governors- Stakeholders Consultations on Sustainable Management of the Lake Naivasha Riparian land

Committees' Recommendations

Group Name /Task	Issues/	Current Status /Findings	Recommendations
Group 1: Access Corridor	1. Establish the status of access corridors and their management needs	• A list of seventeen corridors were listed and alleged by stakeholders to be existing. • Physical planning maps for L. Naivasha obtained from Lands Office (Ardhi House) identified five access corridors: Out of the five we managed to obtain FR (Folio Register) of two YMCA and L. Naivasha Country Club. • Lentolia: The land owner disputed that it was a public access, but some stakeholders still maintained it was a public corridor • Kamere: This corridor exists on the official SoK maps. • Kihoto: This corridor exists on the official SoK maps. • Both the YCMA & L. Naivasha country club: These corridors exist on SoK maps. . However, It was confirmed that the YMCA corridor has been subdivided and allocated to individuals. • During the Chairmen Consultative meeting held on 26th March 2014, Sarah Higgins clarified that the YMCA corridor is a wildlife corridor and L. Naivasha Country Club is a private access. • A public corridor exist around Yellow Green	• The government needs to formalise corridors that are currently being used as public access corridors this includes Kongoni and Kasarani which need to be gazetted by the government. • Relevant government institution to undertake validation of corridors around the lake. • Provision of alternative watering points and identification of public land where grazing can be permitted outside of Riparian Land.

		There was conflict of interest that needs to be solved in order to have a common ground and have issues sorted out amicably																																									
Summary of Corridors legal status from SoK Maps																																											
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Group 2: Encroachment of Riparian Land	- Land Tenure - Demarcation- Lake Naivasha Riparian land - Encroachment on riparian land - illegal alienation of riparian land - Enforcement and Compliance to Policies, Laws and Regulations governing Riparian land	- Riparian land is public land as defined in the Constitution of Kenya and relevant Laws that govern riparian lands in Kenya. - Demarcation- Lake Naivasha Riparian land is all the land enclosed within the 1892.8masl contour and gazetted as Lake Naivasha Water Conservation and Protection Area (Order, 2012), Water Act. - Inventory of encroachers around the lake is required - Illegal alienation of riparian land: - Policies, Laws and Regulations governing riparian land are not effectively enforced - Compliance to Riparian land laws and	- Decommission all illegal development and encroachment on the riparian land - Enforce surrender of illegally alienated riparian land - Governor's office to co-ordinate enforcement of laws and regulations that govern the riparian zone in collaboration with line ministries and agencies. - Promote public education, awareness and sensitization on policies, laws and regulations that govern the riparian land. - Ensure full compliance of conditions in EIA licenses.																																								

		regulations is low	• Develop an integrated Riparian Land management strategy • Establish beacons to demarcate official riparian land boundary
Group 3: Sustainable Use of Riparian land	1. Riparian Land definition 2. Sustainable use of riverine & spring riparian land 3. Sustainable Utilization of lake Naivasha Riparian Land 4. Who Should Use Riparian Land 5. Prohibited uses of riparian land:	• Destruction of natural riparian zone vegetation • Felling and harvesting of trees on riparian land. • Introduction of exotic species • Cultivation of riparian land. • Permanent structures erected on riparian land. • Alienation of riparian land, • Watering of livestock directly from the lake resulting in cattle 'treking' over riparian land. • Constructed wetlands on Riparian land	• Preservation of Riverine vegetation in its natural state. • Watering of livestock from rivers to be permitted for the time being only from traditionally established watering points. The long-term aim being to prohibit any watering of livestock directly from rivers, by abstracting water for the purpose to tanks and troughs sited beyond riparian land. • Abstraction of water over riparian land, if approved, licensed, metered, and regulated by the appropriate authority. • Mining or excavation for harvesting material (eg. building sand) should be expressly prohibited. • Eco-tourism, which should be restricted to boating activities only for purposes of bird, wildlife and flora viewing; and for sporting/recreational purposes. All embarkation (pick-up) and dis-embarkation (put-down) facilities to be appropriately sited and approved by the relevant authority. All boats carrying tourists to be certified by the Kenya Maritime Authority and to have liability insurance cover. Walking tours over riparian land to be expressly prohibited. • Water abstraction only with the approval of the appropriate authority following agreed procedures. All abstractions, as classified in the Water Act, to be licensed and metered.

			• Fishing from approved landing sites for purposes of accessing open waters and removal of catches. All fishing either commercial or sporting to be licensed and to be subject to requisite regulation. In particular there should be no fishing activity during hours of darkness. Recommended Users : - • Titled owners of land adjacent or contiguous to riparian land, • Abstractors of water (licensed). • General Public • Tour Operators • Fishermen
Group 4: Fisheries Management	1. Fisheries policy and legislation 2. Awareness, information and capacity among stakeholders 3. Law enforcement and compliance 4. Fish productivity 5. Applied research in fisheries management 6. Invasive species and pollution in the lake 7. Capacity development of the fisheries department	• Inadequate capacity of Fisheries Department to regulate and enforce fisheries management measures (policy, legislation and resources) • Lack of awareness, information and capacity among stakeholders • Reduced Fish productivity due to lack of; a) Value addition, b) Market access c) Diversification – e.g. sport fishing d) Aquaculture development. • Lack of applied research in Fisheries management • INVASIVE SPECIES- water hyacinth, the water fern salvinia and the duck weed (AZOLLA) • Invasive fauna in the lake include the Crayfish and the Common Carp.	• A code of conduct for sustainable Lake Naivasha fishery to be developed and translated into fisheries county laws. (A draft has been developed) • County government to enhance the capacity of the Fisheries Department by increasing the number of patrol boats, vehicles, and enforcement officers in order to deal with the problem of illegal fishing • All boats operating in the lake to be registered for regulation purposes. (Process ongoing) • Regular stakeholders meetings to be organized to create awareness on sustainable fisheries and investment opportunities. • A fish market to be put up to improve fish trade, and value addition in Naivasha town • A saving and credit cooperative society (SACCO) be formed (Process underway) • County government to support Aquaculture Development And restocking of the lake.

			• Seek additional funding to Kenya Marine and Fisheries Research Institute (KMFRI) to execute fisheries research. • Develop appropriate strategies to control invasive species in the lake.
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Group 5: Sewerage & Sanitation Management	1. Only 11% of Naivasha town is covered by sewerage network 2. Rampant Sewerage bursts due to High Volume of sewerage & solid materials 3. Storm Water drainage connected to sewer system 4. Inadequate Sewerage network 5. Low capacity of Treatment Works 6. High operational costs of the treatment works 7. Vandalism of manhole Covers 8. Development of a constructed wetland adjacent to treatment works	Treatment works designed for less than 50,000 people, current population over 200,000—leading to increased pressure to the system -- hence, ineffective treatment process and poor sanitation conditions	• Undertake a feasibility study to re-design and expand sewerage network and Treatment Works to accommodate increased demand. • Construction of reinforced concrete and PVC manhole covers • NAIVAWASS should immediately acquire appropriate modern equipment for unblocking of the sewer lines e.g. high pressure exhausters. • Review county By-laws (urban development) to improve on sewerage 'solid waste management and storm Water management • PHD, County authorities, Imarisha and other relevant agencies undertake public education, awareness and sensitization on sewerage and sanitation management. Involve the Civil Society Organizations (NGOs, CBOs SHGs and property owners • Sub-county government should regulate the construction buildings and use of septic tanks and ensure that the required standards for construction and management of septic tanks and soak pits are included in the building plans. • Public Health Department should disinfect the areas around the manhole after unblocking as required.
Group 6: Pollution	Poorly managed pollution from point and non point sources.	Current sources and types of pollution in the basin: - informal settlements, hospital waste, mechanical garages, learning Institutions, local	• Enhance capacity of regulatory institutions to improve enforcement and compliance on pollution management.

		markets and fish land beaches, soil erosion, agricultural effluents, urban runoffs, storm water, cattle grazing fields, wildlife grazing fields. Animal and plant material, human waste, pesticides, fertilizers, fungicides, fuel waste, noxious gases, e-waste, plastic materials & polyphonies, metal waste, rubber waste and detergents.	• Develop Code of Conduct for self regulation for pollution control and management. • Capacity building of farmers to adopt sustainable farming practices • Promote/adopt innovative technologies and good practices for integrated waste management • Create appropriate drainage system to control storm floods from upper catchment • Improve waste collection, improved landfills and properly managed dump sites. • Promote solid waste management in the informal settlements like Kihoto, Kamere, Kasarani, KCC and Karagita - approximately 20,000 tons of waste is generated everyday while only 16,000 tons is collected every week. • Promote sustainable development through adherence to EIAs and Annual Environmental Audit reports including waste management strategies by commercial farmers and developers. • Promote public education, awareness and sensitization on waste management for compliance.
Group 7: Vegetation Destruction	1. Vegetation destruction includes cutting of Acacia trees and other plant materials on the riparian land 2. Natural tree falling in the riparian land 3. Papyrus destruction 4. Eucalyptus and other species not required on riparian land: 5. Overgrazing	• Loss of vegetation cover and wetland buffering capacity leading to increased run-off, siltation, low filtration of nutrients and chemicals and high pollution of the lake • Loss of riparian wetland habitat, ecosystem functions and services including biodiversity species and populations	• Promote establishment of tree nurseries to raise indigenous seedlings for planting and engage farmers, land owners, BMU, tour operators and local schools in tree planting on the riparian land and adjacent areas. • Undertake restoration of degraded vegetation cover including papyrus sites and encourage private land owners to be involved in conservation and protection of vegetation. • Develop and adopt appropriate technologies and innovations that promote sustainable energy sources (Biogas, Solar, Wind energy) • Promote Agro-forestry and establishment of wood lots for fuel wood supply to local communities

			○ Naturally falling trees should be allowed to decompose and recycle the nutrients back to the soil ○ Review the licensing procedures for tree cutting on riparian land and seek support from the local administration officers i.e. DCC, ACCs and Chiefs. • Control invasive species including removal of Eucalyptus trees from the riparian land • Support capacity building of KFS to discharge their mandate to ensure enforcement and compliance to the laws and regulations governing vegetation on the riparian land • Promote awareness on importance of vegetation in the ecosystem • Control over-grazing and avoid wild fires on the riparian land.
Group 8 Security	• Inadequate security personnel & operational budget ; • Lack of equipment to detect, investigate and deal with complicated crime; • Lack of security coordination, collaboration and information sharing among stakeholders. • Lack of branding of equipment for identification (boats, vehicles) and animals that would help curb livestock theft • Conflicting land use	• Regular insecurity cases on the Environmental assets, Infrastructure, individual persons and tourists—causing negative impacting on environmental sustainability and development in the region	• Establish data on deployment and distribution of security personnel. • County government to lobby for additional budget to address security issues from the central government • Establish security reporting systems (installations and networks) that harmonize security information and alerts among institutions and stakeholders. • Kenya Maritime Authority should open an office in Nakuru for them to monitor the safety of boats in Lake Naivasha. • Lead agencies should coordinate and enforce branding of equipment/movable assets. • Demystify the issues of security through interactive

	practices: Pastoralism/crop farming/tourism/fishing/wildlife conservation; • Unplanned Urban development and settlements		programmes; it is believed that security is a monopoly/preserve of the police, embrace the Nyumba-Kumi initiative. • Sensitize the citizenry on their role as detectors and reporters of crime and on the indivisibility of peace and security. • Ensure that stakeholders are involved in formulation/implementations of security by-laws and Code of Conduct at the Sub-county level. • Promote proper land use planning, employment creation, income generation and livelihood opportunities among the communities especially in the informal settlements of Kamere, Karagita, Kasarani, KCC, Kihoto etc. • Resolve issues that contribute to conflicts i.e. access corridors, permanent structures, water canals and fence materials on riparian land, • Establish a Naivasha Sub-county security database and information center to improve citizenry access to information on security issues. • Establish an early warning system to deter and pre-empt crime • Design an enforcement coordination strategy of all security players in the riparian land
Group 9: Weak Enforcement of water laws and regulations	• Inadequate capacity (equipment, transport, personnel and budgetary allocation) of WRMA to effectively enforce laws, rules and regulations- and reliance on abstractors for data.	• Weak institutional capacity of WRMA and the Wruas to discharge their mandates • Poor enforcement, regulation and	• • • WRMA headquarters to enhance capacity of the WRMA Sub-regional office-Naivasha and the Wruas.

	• Inadequate capacity of Wruas to discharge their mandate. (governance, technical staff, equipment and operational budget). • Of the 12 WRUAs , only 9 have finalized their Sub-Catchment Management Plans (SCMP) and as a such are operating without clear guidelines. • Lack of access to information and poor communication system within WRUA's. • Inadequate knowledge of water laws, regulations and rules amongst the various stakeholders. • Lack of proper inventory of the hydrological and monitoring data on water resources • Lack of reliable database on the water resource management within the basin. • Conflict of inter-sectoral policies and regulations in the management of the integrated water resources. • Lack of clear understanding on the roles of national and county governments in the management of water resources in the basin.	compliance in water resource management • Inadequate data and information management to guide decision making	• WRMA should establish appropriate database , communication and information management system on water resources • WRMA to honor the Agreement signed with WRUAS as agents and facilitate them to undertake water resource management at sub-catchment levels. • Finalize Water abstraction survey to guide permitting, monitoring and enforcement
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Group 10: Wildlife Control and management	1. Wildlife carrying capacity on riparian land causing destruction/fragmentation of habitat and populations. 2. Obstruction of Wildlife Access corridors, migratory routes and dispersal areas 3. Weak enforcement and Compliance to Wildlife laws and regulations 4. Lack of clarity on the role of KWS & Communities on management of wildlife on riparian land 5. Unregulated tourism activities on riparian land 6. Equitable sharing of wildlife related benefits. 7. Inadequate public education, awareness creation and access to information 8. Poor Urban Planning	• Lake Naivasha is a Ramsar site, an Important Bird Area and is hoping to become a world heritage site but is threatened. • Wildlife habitats and the riparian land facing degradation • Uncontrolled game meat poaching and human-wildlife conflicts • Unsustainable tourism practices on the riparian land. • Lack of integrated urban planning for Naivasha town	• Wildlife populations maintained within appropriate thresholds to prevent destruction of the habitat. • Wildlife corridors to be kept open and properly regulated • The riparian zone be kept intact and in its natural state as wildlife habitat • No introduction of invasive species and those already in place controlled. • Protection of wildlife through enhanced enforcement/ compliance, sharing of intelligence and proper management of human-wildlife conflicts. • All fences, farming activities and buildings on riparian land should be removed • Land bridges to be built over irrigation ditches to ensure free movement of wildlife. • A corridor connecting Hell's Gate Park to Lake Nakuru Park through Eburru, Elmenteita and the local ranches be established. • The game fence on the west shore road to be encouraged and if possible extended as a wildlife protection measure. • The riparian zone should be gazetted as a wildlife conservancy or sanctuary managed and regulated by the lake community in partnership with KWS • A Management Plan for the conservancy be established with codes of conduct for each sector involved with riparian land. • Establish a tourism association for all the tour operators and a code of conduct to regulate the industry on the Lake and riparian zone. • Tourist should only be transported in boats. There should be no walking on riparian land except at designated access points or designated areas (i.e. hotels & Crescent Island). • Livestock watering points should be set outside the
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			riparian land. • No grazing of livestock on riparian land. • Proper town planning that addresses wildlife dispersal, water provision to communities, solid waste management and zoning. • All access corridors to be properly managed to ensure no inappropriate activities take place and no rubbish left, as this kills and harms wildlife. • No vehicles on riparian land and no movement of boats after dark. • Education and awareness activities should be enhanced • Establish a data base on all wildlife, birds, insects, vegetation, etc.
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- Sanction

GROUP 1 – ACCESS CORRIDOR – PROGRESS REPORT

CHALLENGES & RECOMMENDATIONS.

- The Terms of Reference for the group were created as :
 - **Identify existing corridors and their status.**
 - **Identify the need and proposed of more corridors where necessary**
 - **Define sustainable uses of identified official maps around the lake.**

It was further clarified that the committee's ToR limited its mandate to debating on the issue of public access corridors and not the use of Riparian Land.

At this point it was noted that Imarisha do not have an official/registered maps that shows the public access corridors to the lake.

a) Identifying Existing corridors and their status.

The stakeholders gave a list of what they believed were the existing corridors. This was agreed not to be the official list until such a time official maps shall be obtained to identify the same.

Some members disputed the existence of these corridors but it was agreed that only the use of official Survey maps would approve or disapprove this.

Name of Corridor	Status	Name of Corridor	Status
6. Lentolia	On the map & disputed	10. L. Naivasha C Club	On the map
7. Kamere	On the map	11. KWS hippo camp	Not on the Map
8. Kongoni	Not on the Map	12. Kihoto	On the map
9. Elsamere	Not on the Map	13. Manera Pry School	Not on the Map
10. Watalii village -	Not on the Map	14. Morendat Farm	Not on the Map
10. YMCA	On the map	15. Kasarani (2 of them)	Not on the Map
11. Simba Lodge	Not on the Map	16. Bila Shaka	Not on the Map
12. Soap lodge/Flamingo	Not on the Map	17. Oserian	Not on the Map
13. Sanctuary farm	Not on the Map		

Based on the list given, physical planning maps for L. Naivasha obtained from Lands Office (Ardhi House) identified five access corridors:

Out of the five we managed to obtain FR (Folio Register) of two YMCA and L. Naivasha Country Club.

1. **Lentolia:** Despite the fact that the land owner disputed that it was not a public access, and had the official documents that showed it to be private access and not public, some stakeholders still maintained it was a public one. It was noted that this particular issue needed further discussion in a separate forum. There were divided opinions on the construction of an electrical fence erected in this area. Some community members argued that the fence should stay as it had eliminated the previous cases of human wildlife conflict while some wanted it to be removed for access. It was pointed out that there was need to weigh the consequences of each action as each would adversely affect the other.

It was further noted that the fence had been erected at considerable cost and was part of the larger Mundui/Crater Lake/Lentolia wildlife sanctuary.

2. **Kamere:** This corridor exists on the survey maps obtained from Survey of Kenya. The members proposed a ground visit to ascertain its status and also establish if there was contention from the adjacent landowners. The surveyor would carry on searching for particular documents for this corridor.
3. **Kihoto:** This corridor exists on the government map obtained from Survey of Kenya. The members proposed a ground visit to ascertain its status and also establish if there was contention from the adjacent landowners.
4. **Both the YCMA & L. Naivasha country club:** These corridors exist on government map. The folio register was also obtained; current land occupiers are to be approached to determine if they have official documents on the same.

It was noted and confirmed that the YMCA allocations have been done and demarcation of land has been done by the surveyors. Mr Orlando of Kongoni Police Station confirmed that the legal process is ongoing.

During the Chairmen Consultative meeting held on 26th March 2014, Serah Higgins mentioned that YMCA is not a public access but a wildlife corridor and L. Naivasha Country Club is a private corridor.

A public corridor being around Yellow Green was also mentioned during this meeting.

b) Identify the need and purpose of more corridors where necessary.

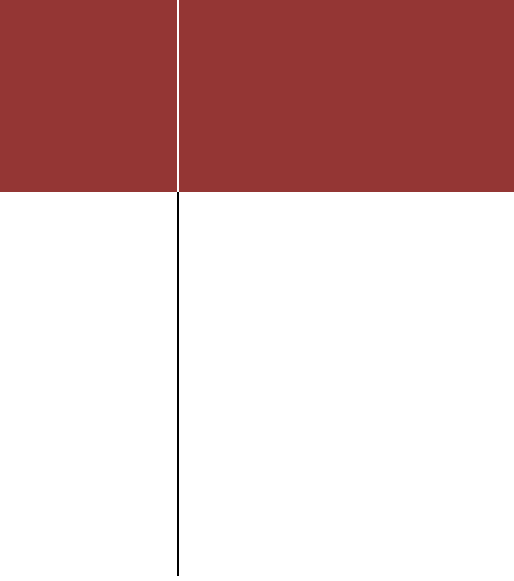
After all the corridors have been identified; then we will determine whether extra access corridors are required and if they are appropriate in keeping with the conservation of the lake.

CHALLENGES.

- **There was conflict of interest that needs to be solved in order to have a common ground and have issues sorted out amicably.**

RECOMENDATIONS

- The group needs to take a different approach to finding a way forwards-this however will require all the various stakeholders to have realistic expectation.
- Need to have a government stakeholder to attend the meeting in future in order to provide technical assistance.
- The committee wished to engage and find out how else the community/stakeholders can be assisted. This will entail engaging the community representatives for more consultations to solve conflicts. Some ideas are provision of watering points and identification of public land where grazing can be permitted out side of Riparian Land.
- The government needs to formalise corridors that are currently being used as public access corridors this includes **Kongoni and Kasarani** which need to be gazetted by the government.
- The Chair mentioned that it was not possible to have access on all the corridors as proposed. The committee needs to be more realistic on what we want to achieve.



REPORT ON PROPOSED MEASURES AND SOLUTIONS FOR CURBING RIPARIAN ZONE ENCROACHMENT

SUBMITTED TO:

H.E KINUTHIA MBUGUA - GOVERNOR NAKURU COUNTY

SUBMITTED BY:

GROUP 2 (RIPARIAN ENCROACHMENT)

Contents

LIST OF TABLES.....	15
1.0 INTOUDUCTION	16
1.1 GOAL.....	16
2.0 RIPARIAN ZONE.....	17
3.0 OWNERSHIP OF RIPARIAN LAND.	17

4.0 DEMARCATION OF RIPARIAN LAND	19
5.0 CASES OF ENCROACHMENT.....	19
6.0 EXTENT OF ENCROACHMENT & INVENTORY OF ENCROACHERS.....	19
7.0 SURRENDER OF ILLEGAL ALIENATION OF RIPARIAN LAND.....	20
8.0 POLICIES, LAWS AND REGULATIONS	20
9.0 RECOMMENDATIONS	21

LIST OF TABLES

Table 1: Roles and Mandates for Organizations & Institutions involved in Management of Lake Naivasha and its riparian zones.....	17
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1.0 INTRODUCTION

Over the last (20) twenty years, lake Naivasha and its ecosystem has been undergoing environmental degradation due to strain and struggle for natural resources. It is in this context that Lake Naivasha and its riparian land is threatened by transformation in land use along the watershed. The entrenched risks linked to degradation of Lake Naivasha and its riparian zone have been acknowledged as serious and requiring urgent attention by the County and National government as well as all stakeholders. Consequently it is in this scenario that stakeholder's conference was convened and chaired by H.E Kinuthia Mbugua on 4th December, 2013 to identify issues that contribute to the degradation, seek solutions to the issues and build consensus on the necessary strategies for sustainable management of the ecosystem.

The stakeholders conference identified and clustered the issues under (10) thematic topics and formed working groups to indulge into more detailed analysis to determine the way forward. The ten thematic topics were (i) Access Corridors (ii) Encroachment on riparian land (iii) Sustainable/Wise Use of Riparian land (iv) Fisheries Management (v) Inadequate sewerage facilities (vi) Pollution from the catchment (vii) Vegetation destruction on riparian land (viii) Security (ix) Weak enforcement and over-abstraction of water (x) Wildlife management on riparian land

GROUP 2 was mandated to identify cases of encroachment along Lake Naivasha riparian zone and propose measures and solutions to address the concerns.

1.1 GOAL

Management of Lake Naivasha riparian zone according to 'wise use principle' (*sustainable utilization for the benefit of mankind in a way compatible with the maintenance of the natural properties of the ecosystem*)

2.0 RIPARIAN ZONE

LAND ACT (No. 6 of 2012) “**riparian reserve**” means the land adjacent to the ocean, lake, sea, rivers, dams and water courses as provided under the Survey Act (Cap. 299) or any other written law;

3.0 OWNERSHIP OF RIPARIAN LAND.

Riparian zone/area/land is a public property under the trust of the government but the neighboring party or community plays a role of being the custodian

Riparian land is public land as defined in the Constitution of Kenya and relevant Laws that govern riparian lands in Kenya.

Organization and Institutions involved in managing Lake Naivasha Riparian zones include;

Table 1: Roles and Mandates for Organizations & Institutions involved in Management of Lake Naivasha and its riparian zones

INSTITUTIONS/ ORGANIZATIONS	MANDATE	ROLES
Lake Naivasha Riparian Association (LNRA)	Stewardship of the Riparian Land	Manage and oversee riparian land by reporting on excessive water abstraction, pollution, illegal development, fish poaching, water quality, encroachment and wildlife control
Kenya Wildlife Services (KWS)	Conserve, manage & enhance Kenyas wildlife	Management of Human wildlife conflict
Water Resource Management Authority (WARMA)	Regulate & manage water resources use effectively	Demarcation of riparian zones
Ministry of Agriculture,	Promote & facilitate production	Make innovative &

INSTITUTIONS/ ORGANIZATIONS	MANDATE	ROLES
Livestock Fisheries	of food and agricultural raw materials for food security and income	commercial- oriented plans towards improving livelihoods
National Environmental Management Authority (NEMA)	Coordination and supervision of all mater relating to environmental management & implementation all environmental policies	Developing policies to protect the riparian Policies, Laws and Regulations
National Land Commission	Manage public land on behalf of national & county government	Manage riparian zones Survey report on Lake Naivasha Riparian Zone

Note (*constitutional provision*) , The Constitution of Kenya 2010,Chapter 5,

Public Land

Article 62 (1)

(f) all minerals and mineral oils as defined by law;

(g) government forests other than forests to which Article 63 (2)

(d) (i) applies, government game reserves, water catchment areas, national parks, government animal sanctuaries, and specially protected areas;

(i) all rivers, lakes and other water bodies as defined by an Act of Parliament;

(j) the territorial sea, the exclusive economic zone and the sea bed;

(l) all land between the high and low water marks;

Article 62 (2) *Public land shall vest in and be held by a county government in trust for the people resident in the county, and shall be administered on their behalf by the National Land Commission*

Article 62 (4) Public land shall not be disposed of or otherwise used except in terms of an Act of Parliament specifying the nature and terms of that disposal or use.

4.0 DEMARCATION OF RIPARIAN LAND

A riparian zone always varies depending on the type of water body i.e River, Lakes/Oceans but generally ranges from 6M – 30M. It is important to note that sometimes the water bodies recede

Lake Naivasha Riparian land is all the land enclosed within the 1892.8masl contour and gazetted as Lake Naivasha Water Conservation and Protection Area (Order, 2012), Water Act. There is urgent need to establish beacons to demarcate the boundary along the contour alignment and official maps availed for guidance of the public.

Note; LAND ACT No. 6 of 2012

12. Allocation of public land

(2) The Commission shall ensure that any public land that has been identified for allocation does not fall within any of the following categories—

(c) public land that is along watersheds, river and stream catchments, public water reservoirs, lakes, beaches, fish landing areas riparian and the territorial sea as may be prescribed;

5.0 CASES OF ENCROACHMENT

Includes; alienation of riparian land, settlements, construction of permanent structures, agricultural activities and any other illegal activity within the official boundary of the riparian land.

6.0 EXTENT OF ENCROACHMENT & INVENTORY OF ENCROACHERS

A confidential report is in preparation in liaison with organization and institution in charge of riparian land management (*see table 1*)

Note; THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT, 1999No 8 of 1999

PART V – PROTECTION AND CONSERVATION OF THE ENVIRONMENT

42.(1) No person shall, without prior written approval of the Director-General given after an environmental impact assessment, in relation to a river, lake or wetland in Kenya, carry out any of the following activities –

- (a) erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, or under the river, lake or wetland;*
- (b) excavate, drill, tunnel or disturb the river, lake or wetland;*
- (c) introduce any animal whether alien or indigenous in a lake, river or wetland;*
- (d) introduce or plant any part of a plant specimen, whether alien or indigenous, dead or alive, in any river, lake or wetland;*
- (e) deposit any substance in a lake, river or wetland or in, on, or under its bed, if that substance would or is likely to have adverse environmental effects on the river, lake or wetland;*
- (f) direct or block any river, lake or wetland from its natural and normal course; or*
- (g) drain any lake, river or wetland.*

7.0 SURRENDER OF ILLEGAL ALIENATION OF RIPARIAN LAND

Action or punitive measures taken upon the encroachers of Lake Naivasha Riparian zone must be within the Kenyan law

8.0 POLICIES, LAWS AND REGULATIONS

There is need to effectively enforce policies, laws and regulation governing Lake Naivasha Riparian zone

Lack of resources, sustainable strategic plans and political will is a challenge on effective enforcement of the policies, laws and regulation governing Lake Naivasha Riparian zone

Note *(constitutional provision)*

The Constitution of Kenya 2010

Chapter 5,

Regulation of land use and property

***Article 66 (1)** The State may regulate the use of any land, or any interest in or right over any land, in the interest of defence, public safety, public order, public morality, public health, or land use planning*

Compliance to Riparian land laws and regulations is low due to inadequate education and awareness among the public and adjacent communities.

9.0 RECOMMENDATIONS

- **Decommission** all illegal development and encroachment activities on the riparian land
- An independent **Joint Enforcement Unit** to be set up through the Governor's office for effective enforcement of laws and regulations that govern the riparian zone should be executed by the line ministries and agencies.
- **Promote** public education, awareness and sensitization on policies, laws and regulations that govern the riparian land.
- **Review** EIA reports on development projects close to the riparian land and ensure full compliance with the conditions in the EIA licenses.

Note (constitutional provision)

The Constitution of Kenya 2010

Chapter 5,

Part 2—Environment and Natural Resources

Article 69. (1) The State shall—

(f) establish systems of environmental impact assessment, environmental audit and monitoring of the environment

- **Develop** an integrated Riparian Land management strategy (plan) that includes a monitoring programme to determine cases of encroachment and prompt measures to mitigate illegal activities.

GROUP 3 - SUBMISSIONS AND RECOMMENDATIONS ON:

SUSTAINABLE WISE USE OF RIPARIAN LAND - LAKE NAIVASHA AND CATCHMENT.

1. Riparian Land Defined:

In order to exercise the group's role of recommending what should be considered as sustainable wise use of riparian land, the group determined the need to define the riparian land over which the recommendations should apply. Being informed by the relevant legal instruments, this was agreed as follows:

Riverine riparian land: All that land contained within a corridor along each bank of a river to a distance measured from the high point of each bank of the river to a distance equivalent to the width of the river as determined by the distance of the high point of the bank, each from the other, always subject to this being a minimum of 6 mt. and a maximum of 30 mt.

Spring riparian land: taking the 'eye of the spring' as the mid-point of the area over which ground water is surfacing, a radius of a minimum of 3 mt. and a maximum of 6 mt.

Lake Naivasha Riparian Land. All that land between the lake water edge, wherever that might be from time to time, and the 1,892.8 m.a.s.l. contour encircling the lake.

2. Sustainable use of riverine and spring riparian land:

The group, by consensus, agreed to recommend the following:

- Preservation of riverine vegetation in its natural state.
- Watering of livestock from rivers to be permitted for the time being only from traditionally established watering points. The long-term aim being to prohibit any watering of livestock directly from rivers, by abstracting water for the purpose to tanks and troughs sited beyond riparian land.
- Abstraction of water over riparian land, as defined, always provided that this is approved, licensed, metered, and regulated by the appropriate authority.
- Mining or excavation for harvesting material (eg. building sand) should be expressly prohibited.

A recommendation for the urgent pegging or demarcation of riverine and spring riparian land zones within the wider lake Naivasha catchment area was recorded and agreed by the group.

3. Sustainable Utilization of lake Naivasha Riparian Land.

The group, by consensus, recommends that the sustainable use of this riparian land should be restricted to only three categories of usage as follows:

1. **Eco-tourism**, which should be restricted to boating activities only for purposes of bird, wildlife and flora viewing; and for sporting purposes. All embarkation (pick-up) and dis-embarkation (put-down) facilities to be appropriately sited and to be approved for the purpose by the relevant authority. All boats carrying tourists to be certified by the Kenya Maritime Authority and to have liability insurance cover. Walking tours over riparian land to be expressly prohibited.
2. **Water abstraction** only with the approval of the appropriate authority following agreed procedures. All abstractions, as classified in the Water Act, to be licensed and metered.
3. **Fishing** from approved landing sites for purposes of accessing open waters and removal of catches. All fishing either commercial or sporting to be licensed and to be subject to requisite regulation. In particular there should be no fishing activity during hours of darkness.

The following activities were listed as being recommended to be expressly prohibited as uses of riparian land:

- No destruction of natural riparian zone vegetation - including *papyrus*
- No felling of trees on riparian land. There was considerable discussion in the group over whether dead and dying trees should be consumptively utilised, and by consensus, it was agreed that all such trees whether upright or fallen should be left undisturbed.
- No introduction of exotic species of any description.
- No cultivation of riparian land. Where this has occurred, the areas should be allowed to revert to natural, unmanaged vegetation.
- No permanent structures to be erected on riparian land. Where this occurred the structures to be destroyed and all materials removed from site.

- No alienation of riparian land, and where this has occurred titles to be surrendered and returned to the Commissioner of Lands for appropriate amendment.
- No watering of livestock directly from the lake resulting in cattle 'treking' over riparian land. Watering points for pastoralists' cattle to be established behind the riparian zones of the corridors, and until such time as this is implemented livestock watering to be permitted for the time being, with access being via the corridors.
- No mining of sand or any other material in the riparian zone.
- No constructed wetlands on riparian land.

4. Who Should Use Riparian Land. Although not specifically mandated in this regard, the group considered it necessary to deliberate on this in the context of the uses being recommended by the group. By consensus the group determined that the following categories of people should be allowed to use riparian land, in accordance with the recommendations set out above:

- Titled owners of land adjacent or contiguous to riparian land
- Abstractors of water (licensed).
- General Public
- Tour Operators.
- Fishermen

5. Closing remarks:

In considering the 3 categories into which land holding in the Republic of Kenya is placed by the Lands Act, namely: privately owned; community; and public, the group wished to emphasize that riparian land is public land and that one of the important facts attaching to public land is that it is inalienable and incapable of attracting title. It was further noted that the ultimate 'custodian' of public land is the government of the day, however, by virtue of the Lake Naivasha Riparian Undertaking between the Government and titled land owners, these owners have a particular role of custodianship, and they should be encouraged to exercise this provided always that they receive necessary support from all regulatory authorities, and do not 'take the law into their own hands'.

GROUP 4 PROGRESS REPORT

LAKE NAIVASHA FISHERIES MANAGEMENT COMMITTEE

TERMS OF REFERENCE:

- i). To identify the Key issues that hinder sustainable Fisheries sector in Lake Naivasha
- ii). To agree on and take mitigation measures on the identified issues

1. ISSUES IDENTIFIED AS HINDERING SUSTAINABLE FISHERIES SECTOR IN LAKE NAIVASHA

- i. Inadequacy in the fisheries policy and Legislation
- ii. Lack of awareness, information and capacity among stakeholders
- iii. Inadequate law enforcement and compliance
- iv. Reduced Fish productivity due to lack of;
 - a) Value addition,
 - b) Market access
 - c) Diversification
 - d) Aquaculture development.
- v. Lack of applied research in Fisheries management
- vi. Invasive species and pollution in the lake.
- vii. Lack of enough capacity by the Fisheries Department to regulate and enforce fisheries management measures.

2. SUMMARY OF ACTIONS AND RECOMMENDATIONS

The following are the actions that the committee has either taken or recommends for sustainable Lake Naivasha fisheries.

- A code of conduct for sustainable Lake Naivasha fishery to be developed and translated into fisheries county laws that provide for stiff penalties for the law breakers. (A draft has been developed)
- Regular meetings to be organized between the Committee, Fisheries Department, the fishermen and other stakeholders to create awareness on sustainable fisheries. (Ongoing)
- All boats operating in the lake including ecotourism and private boats to be registered for regulation purposes. (Ongoing).
- A special armed unit to be deployed for law enforcement in the lake and riparian land to deter poachers of fish and wildlife as well as offering security to residents and visitors. The unit could also be specially trained to carry out search and rescue operations in the lake. (Recommended)
- A fish market to be put up to improve fish trade, and add value to fish in Naivasha town. (Recommended)
- A saving and credit cooperative society (SACCO) to be formed by and for the fisher community. (Ongoing)
- Support by the County government required for Aquaculture Development which is a flagship project of the Vision 2030.(Recommended)
- Support by the County government required for enhanced restocking of the lake. (Recommended).

- Additional funding to Kenya Marine and Fisheries Research Institute (KMFRI) required to make their research more relevant with immediate action being financial support to undertake fish stock assessment.(Recommended)
- Biological and mechanical methods to control proliferation of invasive weeds recommended. (A private stakeholder has expressed willingness to finance a feasibility study on the harvesting of water hyacinth for composite manure production)
- Harvesting of crayfish as a way of controlling its proliferation recommended.
- Capacity enhancement of the Fisheries Department by the County government recommended. **Immediate action required is the purchase of more patrol boats and vehicles, provision of fuel for their running and deployment of County enforcement officers to assist in dealing with the problem of poaching.**

3. DETAILED REPORT

ISSUES IDENTIFIED AS HINDERING SUSTAINABLE FISHERIES SECTOR IN LAKE NAIVASHA

Issues identified as hindering sustainable fisheries sector in Lake Naivasha include:

- Inadequacy in the fisheries policy and Legislation
- Lack of awareness, information and capacity among stakeholders
- Inadequate law enforcement and compliance
- Reduced Fish productivity due to lack of;
 - Value addition,
 - Market access
 - Diversification
 - Aquaculture development.
- Lack of applied research in Fisheries management
- Invasive species and pollution in the lake.
- Lack of enough capacity by the Fisheries Department to regulate and enforce fisheries management measures.

1. FISHERIES POLICY AND LEGISLATION

Challenges

- Beach management Units (BMU) regulations don't adequately address the management issues of the Lake Naivasha fishery and there exists no code of conduct for the fishery.
- Penalties/Fines provided for in the Fisheries Act (Cap 378 of the laws of Kenya) are too low and not deterrent
- All levies collected from the fishery go to the County treasury without anything going back directly for management

Actions

- The committee to initiate development of a code of conduct for Lake Naivasha fishery.
- The committee to initiate development of Fisheries County laws through the Chief Officer responsible for fisheries for approval by the County Assembly. Such County laws should give stiffer penalties for violators
- The committee recommends that a policy should be put in place for some percentage of revenue collected from the Lake fisheries to be brought back for fisheries management. (In other sectors, 80% is brought back.)

2. LACK OF AWARENESS, INFORMATION AND CAPACITY AMONG STAKEHOLDERS

Actions:

- i) Regular meetings to be organized between the committee, Fisheries Department, the fishermen and other stakeholders to create awareness on sustainable fisheries.
- ii) Annual stakeholders' forum to continue being held to sensitize fishermen on good practices, new policies and legislation.

3. INADEQUATE LAW ENFORCEMENT AND COMPLIANCE

Challenges

- i) Presence of illegal, unregistered and unregulated (IUU's) vessels (boats) in Lake Naivasha
- ii) Lack of equitable access to the lake fisheries resources.
- iii) Lack of capacity by the Fisheries Department to enforce the law.

Actions

- i) All boats operating in the lake to be registered for regulation purposes. Registration of fishing boats has already been done while that of eco-tourism boats is ongoing. Private boats will also be required to register with the County government. An operation is planned to remove from the lake all non-complying boats.
- ii) License issuance has been reviewed to give equal opportunities to all. The number of fishing boats has been increased in line with the recommendations of the Lake Naivasha research consortium while plans are underway to establish another landing site around Karagita.
- iii) The committee recommends the establishment of a special armed unit for law enforcement in the lake and riparian land to deter poachers of fish and wildlife as well as offering security to residents and visitors. The unit could also be specially trained to carry out search and rescue operations in the lake. The special unit should be equipped with the necessary resources and tools including patrol vehicles and boats.

4. REDUCED FISH PRODUCTIVITY DUE TO LACK OF; a) VALUE ADDITION, b) MARKET ACCESS, c) DIVERSIFICATION, AND d) AQUACULTURE DEVELOPMENT.

Actions

- i) The committee recommends the establishment of a fish market infrastructure to improve fish trade, value addition and income in Naivasha town by the County government
- ii) The committee recommends that the County government should intervene and sort out once and for all the conflict between Kamere estates (who claim ownership of the land occupied by South lake (Kamere) BMU) and the Kamere BMU. The Landing site is located on riparian land
- iii) Establishment is underway of a saving and credit cooperative society to help the fishermen and fish traders in diversification of fisheries activities and access to SME opportunities.
- iv) The committee recommends support of Aquaculture Development by the County government to ease pressure on the Lake through provision of alternative source of livelihood to fisher community and also provide an alternative source of fish to feed a growing population aware of the benefits of including fish in their diet.
- v) The committee also recommends that the County government supports enhanced restocking of the lake. So far 1 Million Tilapia niloticus fingerlings have been restocked out of the targeted 6 Million.

5. LACK OF APPLIED RESEARCH IN FISHERIES MANAGEMENT

Challenge

While the committee appreciated the need to incorporate scientific information in fisheries management, it noted that the Kenya Marine and Fisheries Research Institute (KMFRI) is seriously underfunded.

Action

The committee recommends additional funding to KMFRI to make their research more relevant. Immediate action should be financial support to undertake fish stock assessment in the Lake. The committee also recommends that the researchers at KMFRI write research proposals and forward them to private partners such as Imarisha and LNGG for possible funding.

6. INVASIVE SPECIES AND POLLUTION IN THE LAKE.

Challenges

Three plant species, water hyacinth, the water fern salvinia and the duck weed are invasive species in Lake Naivasha while invasive fauna in the lake include species such as the Crayfish and even the Common Carp.

Actions

- i) The committee recommends control of pollution in the lake to reduce proliferation of the weeds and enhance the quality of fish. (Pollution and sewerage committees to take note)
- ii) The committee recommends biological and mechanical methods to control proliferation of the invasive weeds. Already a private stakeholder has offered to fund a feasibility study on mechanical harvesting of the hyacinth to make composite manure.
- iii) The committee recommends promotion of alternative uses of water hyacinth – e.g. as fodder or for bio-fuel production.
- iv) The committee recommends the harvesting of crayfish as a way of controlling its proliferation. It however noted that there exists a challenge in finding a market for it. The committee recommends promotion of local consumption.

7. LACK OF CAPACITY DEVELOPMENT OF THE FISHERIES DEPARTMENT TO REGULATE AND ENFORCE FISHERIES MANAGEMENT MEASURES

Challenges

- i) Lack of enough trained personnel
- ii) Lack of other necessary resources including vehicles, engine boats, and funding for effective surveillance and patrols of the lake.

Actions

- i) The Committee recommends capacity enhancement from the County government including formation of the special armed unit. Immediate action required is the procurement of more patrol boats and vehicles, fuel for their running and deployment of County enforcement officers to assist in dealing with the problem of poaching
- ii) The committee recommends re-investment of the revenue collected from fisheries levies in Lake Naivasha to support the management needs of the lake.

CONCLUSION

The Fisheries committee consulted widely in coming up with the issues affecting the Lake fishery and the actions required and believes it is possible to have a sustainable fishery in Lake Naivasha. It requests to be given more time or to be made a standing committee so that it can continue following

up on implementation of the recommendations. It further requests for the necessary facilitation and cooperation from the County government where this is required in order for it to fulfill its mandate. For a start, an operation as mentioned earlier is important to rid the lake of all illegal and unregistered boats and nets.

Signed.....Chairman
..... Secretary



SEWERAGE SITUATION AND MANAGEMENT IN NAIVASHA TOWN

Group 5

May 2014

Executive Summary

The Committee evaluated the sewerage situation in the Naivasha basin and identified the key issues that affecting effective and efficient sewerage services provision within Naivasha town. This report provides details of the critical issues relating to sewerage in Naivasha and provides recommendation on how the poor sewerage service provision Naivasha can be improved.

The Committee realized that only 11% of the town is covered by a conventional sewerage articulation network. The other 89% of Naivasha comprising of the Main town and the satellite settlements are serviced through pit latrines and septic tanks. Sewerage waste exhausted from the septic tanks is discharged into the overstretched Naivasha sewerage treatment plant that has a capacity of only 800m³per day

The Population of Naivasha has risen to over 250,000 people thus requiring appropriate planning to ensure provision of adequate social amenities.

To alleviate the sewerage problems in Naivasha the committee recommends a total overhaul of the sewerage system and development of an integrated development plan for Naivasha.

1. Introduction

The purpose of sewerage collection and disposal systems is intended to transport sewage through the town and other adjacent residential areas to the sewage treatment plants as a measure to maintain acceptable public health standards and prevent diseases and pollution to the environment. At the sewage treatment works, the Sewage is supposed to be treated adequately to control pollution before discharge of the effluent water to the surrounding environment.

The sewage system in Naivasha conveys the waste water by gravity from a larger part of the residential areas that are connected to the articulation system to the Naivasha sewage treatment plant. In some areas of the town due to limitation of the topographic relief, gravity collection systems are not possible and the sewage requires to be pumped through a pipeline to the treatment plant. Such areas include Kihoto, and the lower side of the residential parts of the Industrial area. Other satellite settlements around the lake are not connected to the sewerage systems and are serviced through the effluent sewer systems or Septic Tank. At each residential block, a buried collection tank is used to secure waste and when full are the waste is exhausted and delivered to the central treatment works

2. Committee Members

1. Jane Warigia - LNDEG
2. Elizabeth Wanjiku – Wendani SHG
3. Susan Muthoni - Umbrella Wrua Association
4. Elizabeth Wagacha - LNRA
5. Elizabeth Nyokabi - Urumwe SHG
6. Jim N. Njau- GEPA project/ Interim Chair for the Committee
7. Patrick Wamiti - GEPA project
8. James Gichana /Douglas Bosire – NAIVAWASS
9. Bette Hopcraft – Loldia-Ndulele Ltd
10. Joseph Anyangu/ Adan Boru – Ven Den Berg Roses
11. Kamau Mbogo – Imarisha Secretariat

12. Joseph Magu (Absentee)
13. Mike Roka(Absentee)
14. Maenga Kisotu (Absentee)

3. Terms of reference

- 1) Identify the key sewerage and sanitation issues related to the LN riparian land
- 2) Provide mitigation/ recommendations to the identified sewerage and sanitation issues

4. Execution of the Task

The committee held three meetings. In the first meeting the committee developed its terms of references and a plan of action. The committee obtained technical information and a data from relevant persons and institutions through group discussion, administering questionnaires and request for technical reports. The sources of information included the Sub-county office, National Environment and Management Authority (NEMA), The District Public health, Naivasha Water Sanitation and Sewerage (NAIVAWASS) Company, Flower farms and Hotel establishments around the lake. The deliberations from the committee meetings and information obtained from the relevant institutions forms the foundation of this report

5. Observation and findings of the group

a) Coverage of sewerage network within Naivasha town and around the lake

The Existing Naivasha systems was constructed was constructed in 1974. It covers only 15% of Naivasha town. The larger proportion of the subserviced part of the town includes the satellite settlements around the lake. The sewerage system is inadequate and requires extension.

b) Capacity of the sewerage treatment.

The system can only accommodates a capacity of only 800m³/day. Even if the other parts of the town were connected to the system, it does not have the capacity to handle increased volumes. The proposed actions including exploring alternatives of sewerage management, expansion of the treatment system and attachment of a constructed wetland to existing treatment works

c) Monitoring of sewerage management

Sewage systems in Naivasha comprises of five components

- Area under the Sewerage Network/coverage
- Sewerage from the Flower farms and their treatment works
- Sanitation : Solid waste which is under the management of the Sub-County/Municipal
- Septic sewerage from the rest of the town exhausted and discharged at the Treatment Works
- The sewage Treatment Works

Information available on all the above systems and the quantities of waste discharged and processed is inadequate. During the execution of this task, the committee attempted to get information from the relevant Institutions but only a few responded to the committee's request. **Out of thirty questionnaires sent out, only five responses - from Oserian flower farm, Finlays flower farm, Samba lodge,) were received.** The report from NAIVAWASS provided information on the areas under the coverage of the sewerage networks and the treatment works.

As a system becomes older it also requires a higher standard of maintenance than before. No monitoring and maintenance schedules are in place.

d) Inadequate/ poor sewerage infrastructure

During the execution of this task, the committee noted that 85% of Naivasha town is not covered by a sewerage articulation system. Most parts of the town and the satellite settlements are serviced through private long drop toilets/Pit Latrines and Septic tanks which when full are then emptied and the sludge taken to the central treatment works. The network was also poorly planned during its initial installation. Some of the pipes are narrow therefore inadequate for the current sewage and storm water flows. The collection (lateral pipes) connects at right angles at the junction points to the main (branch) pipes resulting to back flows. Most manholes are open due to vandalism of metal component of the manhole covers resulting to entry of storm water and other unwanted solid materials hence causing sewerage lines blockages

The industrial area of the town is at a lower elevation than the rest of the town. About 10years ago, a lift station was constructed along Moi South Lake road. The lift station is a gravity sewer pump designed to lift accumulated sewage to a higher elevation joining to the trunk sewerage pipe that runs along Moi South Lake road. The lift pump has never been utilized because it has not been handed over to the client by the contractor due to non-payment of fees.

e) Technical capacity for sewerage management

Management of the sewage system is dependent on the technical capacity of the staff deployed to attend to the issues by the relevant institutions- NIAVAWASS, Public Health, & Sub-County Office. These institutions have demonstrated that they do not adequate technical capacity to manage and monitor the sewerage and sanitation systems within Naivasha.

f) Education, awareness creation and information sharing among stakeholders on sewerage and sanitation management:

There is low awareness on the sewerage and sanitation management within the basin. This has contributed to the low level of responsibility by the stakeholders in both paying for services and also appropriate handling of waste within the residential areas. To resolve this issues, there is need to develop a strategy on awareness creation. This also should include public stakeholders meetings, engagements with policy maker e.g. national / county government.

g) Poor urban planning with inadequate sewerage and sanitation facilities

Naivasha Town has continued to grow over the years without proper development planning especially for the residential areas. Poor planning in the development of the town will continue to impact on the sewerage management.

Action:

- Engage the County Government for proper future planning and improvement of current system.

**h) Enforcement/ Compliance- sewerage management- EIAs, Regulations/
Rules governing development**

Development especially for human habitation does not adhere to required sewerage management standards. Most of the sewerage exhausted from the septic tanks does not reach the treatment works (potential source of pollution)

Action:

- Town Planner should ensure habited premises have adequate provision for sewerage management..
- Report on enforcement from NEMA (provide list of Licensed Exhauster Companies), Naivasha District Public Health and Planning office –Sub-County Office Naivasha .

i) Vandalism of sewerage infrastructure

There is high theft of manhole covers to scavenge the metal parts for sale to scrap metal dealers. There should be control on the sale of scrap metals within the town through establishment of the by-laws by County government.

6. Conclusion and Recommendation

From the various discussions and interviews with technical persons within the sectors, the following recommendations have been proposed to alleviate the sewerage situation around Lake Naivasha.

- ❖ Redesign and expand the sewerage treatment works to accommodate higher human population and development around the LN Re-design and overhaul the entire sewage system in Naivasha to accommodate the expanding population.
- ❖ Re-design and undertake expansion of the Naivasha Treatment Works to accommodate increased demand from Naivasha town. Re-design and install larger sewerage piping system and network to improve flow and disposal of sewerage material from town to the treatment works. Sewage pump stations should be constructed at appropriate locations to ensure efficient flow of sewage to the treatment works. Screens and sieves should be installed to remove solid substances from the network.
- ❖ Residents should be directed to ensure storm water drainage is Separated from sewerage lines Notices should be sent to the residents to stop directing roof catchment water into the sewerage lines which is currently increasing pressure on the system
- ❖ Undertake development of constructed wetlands adjacent to the conventional treatment works enhance the treatment of effluents being discharged to the environment.
- ❖ Enhance awareness among stakeholders/ inhabitants
- ❖ Develop a comprehensive integrated waste management in Naivasha through Review the By-laws to improve on waste management in the town and within the estates
- ❖ Integrated planning of urban development and riparian land
- ❖ Protection of public land allocated for sewerage plant should be initiated immediately
- ❖ Cannibalization of manhole covers should be stopped.
- ❖ Undertake regular monitoring of the Sewerage system. NAIVAWASS should acquire appropriate modern equipments for unblocking of sewer lines i.e. high pressure exhauster. After unblocking the clogged lines NAIVAWASS and the Public Health department should disinfect the areas around the manhole as required.
- ❖ NAIVAWASS - should develop a proposal to be submitted to RVWSB, WSTF, Government and donors to raise funds for expansion of the networks, re-designing and expansion of the treatment works, establishment of a constructed wetland and other waste management facilities. More public education, awareness and sensitization on sewerage management be promoted by the PHD, MCN and other agencies. Involve the Civil Society Organizations (NGOs, CBOs, and SHGs) as appropriate. The Sub-county government should regulate the construction and use of septic tanks and ensure that the required standards for construction and management of septic tanks and soak pits are included in the plans.

A follow up with the County Government and other relevant Authorities should also be instated immediately.

SUSTAINABLE MANAGEMENT OF LAKE NAIVASHA RIPARIAN LAND

Group Six Report

Topic: Pollution from the catchment

Chairperson: Absolom J Mukuusi

Secretary: Dominic Mwang

Executive Summary

This report presents findings by group six, on pollution from the catchment of Lake Naivasha. The report discusses the composition of the group, ToRs, methodologies used, major causes of pollution, types of pollution and sources of pollution in the catchment. The report provides a bird's eye view on the important legislations and institutional arrangement that provides structures and principles for pollution management.

Major issues of pollution, recommendations and respective institutions bound with responsibilities of its management, enforcement and implementation are presented in the recommendation log frame.

Contents

Executive summary	35
Introduction.....	36
Terms of reference.....	37
Group members	38
Methodology.....	38
Meetings.....	38
Consultations	38
Data collection.....	39
Field visits.....	39
Issues/challenges as discussed.....	39
Overview on pollution.....	39
Water cycle and pollution.....	39
What's the relation of water cycle and pollution?	39
Point Sources Pollution.....	40
Non-point sources of pollution	41
Types of pollution, potential sources and impacts in the basin.....	41
Policies, legislation, rules relating pollution together with enforcement and compliance	42
Institutional arrangements for pollution management.....	43
Education, Awareness and Information dissemination	43
E-waste, Technology transfers and Innovations.....	43
Recommendations	44
Conclusion	46
Annexes	48
Summary Report by Physical Planning office.....	48
Summary Report by NAIVAWASS	49
Summary Report by MoA	52
Field visit report.....	53
First Group Meeting Minutes.....	55
Second Group Meeting Minutes.....	60
Last group meeting minutes	65

Introduction

Lake Naivasha Basin is the area covered by all the rivers and streams draining into Lake Naivasha. The lake is located at Latitude 0° 45' 0" S and Longitude 36° 20' 0" E. It is a fresh water lake found within the Great Rift valley of Kenya, about 100 km North West of Nairobi. It is situated at an altitude of 1800 meters above the sea level. The lake covers about 140 sq. km. Two rivers from the

Aberdares range feed into the lake: River Malewa and River Gilgil. The Lake Naivasha Basin is about 3,240 sq km. It comprises three distinct catchments that drain into the Northern part of the Lake: the Malewa (1750 sq.km) which rises in the Aberdares ranges to the east and north at an elevation of almost 4000m, the Gilgil (420 sq km) in rift highlands due north, and the Karati (70 sq km), on the Kinangop plateau to the west. Many small basins with a total size of 1000 sq.km drain the southern and western part of the basin.

The basin over a period of time has been faced with threats from anthropogenic activities contributing to the declining quality of the water and the entire ecosystem. This has been associated with continued degradation of the catchment. Despite the introduction of a number of projects to restore the catchment value, still evidence of continuous unsustainable land use practices can be viewed. Massive uncontrolled crop farming along the tributaries of river Malewa is evident, where crude methods of crop farming are utilized. These have contributed to excessive siltation, leaching and runoff wash of fertilizers to the river systems flowing to the lake. Uncontrolled and unplanned development of urban areas within the catchment has also posed a serious threat to the existence of the lake. Raw enriched fluids are flowing from the residential and commercial building into the river systems that ends up into the lake as a result;

- Lake water has become highly polluted, with especially high turbidity and its oxygen content severely reduced.
- The lake is eutrophic and invaded by foreign species e.g. water hyacinth.

Terms of reference

The following are the TOR for the group;

- Identify the key Pollution issues (Types & Sources) from the LN Catchment
- Identify the Impacts of pollution
- Provide recommendations/mitigation measures to control and manage pollution in the catchment

Group members

Name	Institution/Group
ABSOLOM MUKUUSI – CHAIRING	Naivasha Professionals Association (NPA)
GUY ERSKINE	Sanctuary Farm
ESTHER MBUTHIA	AMUA/LANCODO
DOMINIC MWANGI - SECRETARY	NAGGA
DANIEL O. OTHIM	BMU
DANIEL MAINA	District Water Office
EZEKIEL HUBES	MWIHANGERI SHG
PATRICK W. KINGARU	Public Health Department
GARY HOPCRAFT	Loldia farm
RICHARD FOX	Imarisha
NJUGUNA KAMAU	Chamber of Commerce
MBOGO KAMAU	Imarisha
ANDERSON KOYO	Imarisha

In attendance

Dorglas Bosire – Naivasha Water Sewerage and Sanitation Company

Methodology

Meetings

The task committee was able to hold three meetings. The meetings generated minutes that form part of this report as annexes. During the meetings members were able to discuss and brainstorm openly on the issues as they were raised. Consensus was reached at in cases of misunderstanding.

Consultations

As part of sourcing for credible information and facts on issues that weren't clear, the committee exercised its powers by inviting specific technical officers from relevant departments both from the private and public sectors. Among the sectors and departments consulted included;

- Naivasha water and sanitation company
- Ministry of agriculture
- The department of public health
- The department of the town planer
- The department of environment (sub-county)
- National environment management authority
- Water resources management authority

Representatives from the NAIVAWASS, PHD, were able to attend the meetings of the committee as requested while we received copies of reports and recommendations from; MoA, Town Planner, Environment department, and Nema. The committee however was unable to get any reports from WRMA office.

Data collection

The task committee utilized simple methodologies of data collection to attain the desired information. The most utilized data collection methodology was observations and perusal of existing documents – literature. Among the literature utilized included existing legislation touching on pollution and reports from the respective departments and ministries.

Field visits

The task team organized for a one day field visit to the catchment, in areas that were identified as hot spots for pollution. These areas included; Ndinda centre, Naivasha town dumping site, KCC settlement, Naivasha town sewer treatment works, Karagita estate and Kamere fish landing beach. Among the things that were looked at include; farming practices in the upper catchment along the river systems, disposal of waste from slaughter houses, dumping in the river systems.

A summary of the field report was compiled and attached to this report as an annex

Issues/challenges as discussed

Overview on pollution

Water pollution is contamination of water by foreign matter that deteriorates the quality of the water. Water pollution covers pollutions in liquid forms like ocean pollution and river pollution. As the term applies, liquid pollution occurs in the oceans, lakes, streams, rivers, underground water and bays, in short liquid-containing areas. It involves the release of toxic substances, pathogenic germs, substances that require much oxygen to decompose, easy-soluble substances, radioactivity, etc. that become deposited upon the bottom and their accumulations will interfere with the condition of aquatic ecosystems. For example, the eutrophication: lack of oxygen in a water body caused by excessive algae growths because of enrichment of pollutants.

Water cycle and pollution

Water cycle is, simply saying, the circulation of water in earth. In fact, the water in the earth's biosphere is used and reused again and again. This is called water cycle or continuous movement of water between the earth and the atmosphere. It involves the following mechanisms:

- Evaporation: changing of water from liquid to gas
- Transpiration: Release of water vapor from plant leaves
- Condensation: changing of vapor to liquid (cooled down)
- Precipitation: Water that returns to the earth (water droplets in clouds become large enough and there comes the rain).

What's the relation of water cycle and pollution?

According to the water cycle, naturally, water around us will be absorbed to the land (soil) and rivers will stream from the upstream to the downstream and released to the sea. In normal situation organic pollutants are biodegraded by microbes and converted to a form that brings benefits to the aquatic life. And for the inorganic pollutants, in the same situation, don't bring to much hazards because they are widely dispersed and have almost no effect to the environment which they are released to.

In a small scale, both inorganic and organic pollutants safely decompose throughout the stream, their concentration decrease in the sea, and they don't harm the sea ecosystem and its distribution. But in an excessive scale, communities in beach and estuary will be affected by the pollutants, and can heavily harm them.

To be able to address this thematic area, the group identified six areas of discussions;

- Point source pollution
- Non-point source pollution
- Types of pollution, potential sources and impact
- Policies, legislation, rules relating pollution together with enforcement and compliance
- Institutional arrangements for pollution management
- Education, Awareness and Information dissemination (Technology transfers, & Innovations)
- E-Waste

Point Sources Pollution

Point source pollution, on the most basic level, is water pollution that comes from a single, discrete place, typically a pipe. The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

Sources and transport systems within the basin Include:

- Sewerage waste, waste canals, industrial waste, river systems, cattle pens on riparian land and slaughter houses (Ol-Kalou, Ndinda slaughter house discharging to tributaries of river Malewa and privately owned slaughter houses at Karagita, Kameere, Marula, Kongoni, Kasarani, Gilgil).
- Other Urban Centers within the Basin and on the beaches around the Lake. There is need for proper waste management in the urban centers and on the beaches.
- Hospital waste, Learning Institutions and in the Markets – How do they dispose their waste materials? most waste generated in learning institutions is disposed through open burning, while others use dug out pits and pit latrines. Apart from Naivasha town, most markets within the catchment produce huge amounts of waste that is left to decompose on site, or is swept into rivers systems and open drains.
- Cattle pens and grazing ground around the lake. A lot of cattle is being held within lake and river riparian land and are a major source of pollution. some areas within the catchment, cultivation is done within the riparian zone close to the river bank where runoff from livestock waste enters the river system directly.
- The Naivasha sewerage system was identified as a major source of pollution especially due to bursts and blockages that occur along the network sewer lines in particular near the Total junction, Council Estate. The Naivasha Sewerage treatment plant also presented an alarming threat due to its deterioration and inefficiency, with improperly treated sewage being piped directly into the lake system.

Non-point sources of pollution

Nonpoint source pollution comes from oil, pet waste, pesticide, herbicide, fertilizer, road salt, bacteria, sediment, and any other contaminant that ends up on the ground naturally or from human activity. Rainwater picks up these contaminants as it washes over yards, sidewalks, driveways, parking lots, and fields and deposits them into Lake Naivasha and rivers. Common sources of nonpoint source pollution in Lake Naivasha include:

- animal production operations and feedlots – grazing fields;
- agricultural activities – leaching and erosion;
- stream bank and shoreline erosion;
- timber harvesting;
- land development;
- on-site sewage disposal units;
- solid waste disposal landfills;
- transportation-related facilities;
- storm water;
- atmospheric deposition and,
- detergents use near water;

Largely carried through the surface run-off especially in all the urban settlements. Most of the settlements and a large section of Naivasha town still use pit latrines which are a major source of pollution to ground water aquifers. There is poor monitoring of waste management and disposal systems within the town, some of which are located in the wrong sites.

Types of pollution, potential sources and impacts in the basin

Organic pollution – these are contaminants in an environment that can be oxidized (biodegraded) by microorganisms. They include biodegradable organic matter-animal waste, human waste, dead animal/plant material, and wood waste.

Potential sources within the catchment include; farmlands, grazing fields (livestock & wildlife), saw mills, institutions (schools, hospitals), restaurants and recreation areas, market areas.

Inorganic pollution - pesticides, fertilizers, fungicides, fuel waste, noxious gases – Olkaria , heavy metals, e-waste, plastic materials, metal waste, rubber waste, and detergents from washing.

Potential sources are from Olkaria, flowers farms, Cable manufacturing factory, Keroche Breweries, Garages within Naivasha, Car washes- along the river and the riparian areas.

Major Impacts to the lake;

- Lake water pollution especially nutrient loading Eutrophication,
- Decline quality of water for economic uses,
- Decline of aquatic biodiversity and products such as fish.

Policies, legislation, rules relating pollution together with enforcement and compliance

The Committee appreciates that there are several national policies, legislation and by-laws that address the issue of pollution.

The water act 2002; Provides a clear legislation arrangement for the management and conservation of the water resource. WRMA is mandated by the act to protect water catchment areas including monitoring for pollution sources.

Cap 265; This provided for the formulation and enactment of By-Laws on waste management within municipalities. The act is outdated and has been replaced by the urban areas and cities act 2011. However the UACA 2011 does not direct on the issues of waste management and pollution directly and the function is left to the county assembly to formulate and enact policies that provide clear guidance on these issues.

EMCA 1999; The act provides for the formulation of waste management rules by NEMA as the principal custodian. Waste management rules 2006, provides for regulations on waste management that includes licensing, transportation, handling, storage and disposal, including penalties for non-compliance.

Physical Planning Act cap 286 of 1996; provides for environmental guidance on planning for human settlement. The act also sets standards for building structures and infrastructures within urban centres. It stipulates the need for close monitoring of all structures through the construction process from inception to completion – completion and occupation certificate issuance.

Recommendations to the act include;

- There is an urgent need to prepare a catchment area physical development plan. The catchment area should be gazetted and protected by the catchment plan. This plan will regulate all activities including minimum land subdivision and any new settlement.
- There is need to prepare urban development plans of all urban areas in the catchment. This will ensure that our towns are growing in harmony with the environment.
- There is need to engage neighboring counties such as Nyandarua on management of the catchment. This will help consolidate resources and efforts.
- There is need to harmonize government institutions working on management of the riparian. This will ensure consolidation of efforts and resources. These institutions include the Public Health Department, Water department, NEMA, County Government, Fisheries, Provincial Administration among others.

Public Health Act cap 242; PART IX on sanitation and housing stipulates clearly rules and regulation on prevention of public nuisance that touches of health matters. The act categorize any source and/or form of pollution as part of public nuisance, which is highly prohibited by the act and provides for its management, protection and even penalties for violation.

Shortcomings in the act however include;

1. Need to include the new technologies of solid and liquid waste management.
2. Need to include current environment pollution issues e.g the air pollution.

3. Aligning the ACT with the current devolution in the county.
4. Need to have legislation, by laws at the county level on Public health issues being in line with the current challenges encountered.
5. Need to include stakeholder Participation.

Draft UPAL policy 2010; Provides guidelines on agricultural practices within peri-urban areas. A detailed summary of the policy is provided in the annex.

Proposals;

- The Committee to Make Appropriate input to the Draft County By-laws on Pollution Control and Management
- A Code of Conduct to be developed to control and manage pollution in the basin and all developers to subscribe to the CoC

Institutional arrangements for pollution management

Need for clear institutional arrangement and structure is key to management and monitoring of pollution within the basin. The committee appreciates the fact that under the current structure, there are a good number of institutions charged with the responsibility of ensuring limited pollution to the environment. The institutions however work independently from each other leaving gaps that offenders have been able to exploit. Among the institutions that have a direct responsibility in pollution management include; NEMA, Sub-county office, Public health, Agriculture, Fisheries, KWS, Livestock, WRMA, and NAIVAWASS.

Despite the presence of these institutions, there is still constraints in implementing the policies guiding them due to; weak enforcement due to capacity in human resources, infrastructure, inadequate funding and lack of facilities and equipment.

Education, Awareness and Information dissemination

Education, awareness and information dissemination is a critical aspect in the management and control of pollution within the catchment. Lack or insufficient education, awareness and information dissemination on pollution among the community within the catchment pose a threat to the existence of the water systems. Ignorance among the community has contributed to continuous release of toxic substances into the river systems as they take it as the dumping sites. Within the catchment this is widely evident in most satellite urban centres and farmlands. Communities within the catchment have no access to information concerning impact of pollution to the water system. Most information has widely concentrated on conservation and restoration of the catchment value through tree planting without considering the increased release of nutrients to the water system through agricultural activities and in the market centres.

E-waste, Technology transfers and Innovations

The menace of e-waste is evident in the catchment especially in the urban centers where there is a lot of it being generated uncontrolled. There are no known clear evidence of legislations on technological transfers and innovations that govern pollution from e-waste. There is therefore need for the county government to incorporate stakeholders in the various sectors generating this kind of

waste to draft policy guidelines for its disposal and management. It is therefore important to have a technical team look at the following;

- Identify types of E-Waste being generated and source
- What are the existing solid waste management innovations/technologies in Naivasha?
- Do they meet national/international standards?
- Who is applying the innovation and technologies and where?
- Identify gaps in innovation and technologies in Naivasha? Suggest how to fill in the gaps

Recommendations

Issue	Recommendations	Responsibility
Naivasha town sewage menace	● To replace the sieve along the prison sewer line to remove solid waste, undertake maintenance of the sewerage lines and conduct regular monitoring of the line. ● Undertake expansion of the Naivasha Treatment Works to accommodate increased volume of waste from the entire Naivasha town.. ● Redesign the drainage system to control flush floods that run through Naivasha town during storm rain and expand the sewerage Network in Naivasha town. ● The sewage to the Sewage Booster Pump Station has never been commissioned. Cannibalization of manhole covers undermines the capacity of the sewerage systems. The County Government to intervene to ensure the sewage pump station is handed over to the water and sewerage management company. ● Create a drainage channel to realign surface floods from Kinangop plateau to flow into Karati River instead of flowing as open floods through Naivasha town. ● The Sub County government to undertake proper drainage planning for the Naivasha urban center and the surrounding areas ● Improve sewerage and sanitation services and proper planning for infrastructure development especially in the informal settlements	NAIVAWASS County Government

Solid waste management	• Naivasha Town Council to enhance waste collection and management system in town and on the beaches • Review the By-laws and make appropriate recommendation to improve on waste management in town and regulate livestock keeping within the estates. • Explore production of Fertilizer from the sewage and waste materials waste.	Sub-County Public Health Department
Policy legislation	• Enhance enforcement of relevant policies, laws and rules by all the agencies concerned • Promote education, awareness and sensitization of impacts of pollution and support initiative that improve compliance • Undertake a monitoring programme on pollution in the basin. • Adopt technologies for effective pollution and waste management. • The Committee to Make Appropriate input to the Draft County By-laws on Pollution Control and Management • A Code of Conduct to be developed to control and manage pollution in the basin and all developers to subscribe to the CoC.	Line ministries and departments County Government
Weak Institution structures	• Need to conduct Rapid assessment of the institutions to determine their capacity for effective management of pollution and waste materials- including policies, laws and regulations governing pollution management. • Need to review pollution management technologies and practices in the Basin i.e. agricultural practices such as terracing, grass stripping, tree planting, hydroponics, constructed wetlands, landfills, treatment and recycling works for waste management- e.g. fertilizers, landfills, biogas production, solid waste separation and recycling, value addition, marketing etc • Recommend for additional field	County Government

	extension officers to be recruited	
Inadequate Education, awareness and information dissemination structures	- Identify institutional arrangement that can effectively develop and disseminate information on pollution - Emphasis to be placed in the education curricular on pollution management and control - Regular forums to address effects and impacts of pollution in the environment	County Government Imarisha Naivasha
Lack of Technology transfers and innovations initiatives	- Identify and document new technologies - Invest in new technologies for waste management - Adoption of new farming & livestock husbandry techniques to minimize generation of waste that cause pollution	County Government through line ministries
E-waste menace	- Identify and document sources of E-Waste - Constitute a team of experts to analyze and evaluate the impact of E-Waste within the catchment - Develop a code of conduct for E-Waste management and disposal for the county	County Government

Conclusion

Lake Naivasha is an important ecosystem that needs to be guarded by all means to ensure the continued survival and existence of critical ecological processes. The existence of the catchment plays a pivotal role in the sustainability of the lake ecosystem; hence its pollution will have a long term negative impact. As from the findings of this report, it is important to sensitize all the stakeholders within the catchment on the importance of minimizing pollution into the water system. Key government institutions and civil societies charged with the mandate of monitoring the lake ecosystem should be empowered more with enough resources to ensure a close check of the activities happening within the basin. Imarisha Naivasha, should lead the park by providing timely updates on the status of the basin. This should be able to inform the county government and the line ministry at the national level on the happenings within the basin to influence policy decisions that shall enhance conservation initiatives.

The county government therefore should be ready to recognize and complement the efforts by Imarisha Naivasha by providing a comprehensive legislation that will support its activities in the basin as the lead institution as it has the national government support. This should call for allocation of resources both financial and manpower being anchored under the county ministry of environment, natural resources, water and energy.

Annexes

Summary Report by Physical Planning office Physical Planning and Water Catchment Management

The Physical Planning Act Cap 286 was enacted in the year 1996 to guide the general planning of Human Settlements in Kenya. This includes all activities taking place on the land. The planning of water catchment areas is a sensitive issue that should be handled in a manner that the ecological balance is upheld. There is need to ensure that any development on the water catchment is friendly and will add value to the environment.

Land subdivided in the agricultural areas upstream causes material change in the use of land. Land subdivision leads to introduction of new homes and businesses among other human activities. New human activities will lead to a change in the functioning of the ecosystem. There is need to regulate haphazard land subdivision upstream in order to limit introduction of activities that will impact negatively on water bodies. Land subdivision also leads to fragmentation of land to uneconomical sizes which brings about poor farming practices such overgrazing, use of excessive artificial fertilizers and pesticides. Small parcels of land encourage small scale farmers to cultivate to the river banks which causes soil erosion that leads to siltation of the lakes and rivers. This ends up affecting the lake biodiversity including fish production.

Urban areas including rural market centres are a source of environmental pollution brought about by solid and liquid waste discharge to water bodies. These settlements need proper urban development plans with proper strategies for solid and liquid waste management.

The capacity of planning authorities to regulate development is inadequate. There are inadequate skilled personnel to monitor development in the water catchment areas. There is need to expand the planning team to be able to effectively reach all developments within the water catchment areas.

Management of land and the environment is a multidisciplinary function that if not well harmonized, very little will be achieved. The current institutional set up is not coordinated and every government department or agency is working on its own.

Recommendations

- There is an urgent need to prepare a catchment area physical development plan. The catchment area should be gazettted and protected by the catchment plan. This plan will regulate all activities including minimum land subdivision and any new settlement.
- There is need to prepare urban development plans of all urban areas in the catchment. This will ensure that our towns are growing in harmony with the environment.
- There is need to engage neighboring counties such as Nyandarua on management of the catchment. This will help consolidate resources and efforts.
- There is need to harmonize government institutions working on management of the riparian. This will ensure consolidation of efforts and resources. These institutions include the Public Health Department, Water department, NEMA, County Government, Fisheries, Provincial Administration among others.

**Summary Report by
NAIVASHA WATER, SEWERAGE & SANITATION COMPANY LTD.**

PROCESS OF SEWERAGE TREATMENT PLANT.

The mechanical pre-treatment is removes course material (litter) and sand. The biological treatment process of extended aeration follows. Pollution is broken down by bacteria and other micro-organisms for which oxygen supply is essential. The water is post treated in maturation ponds where a natural treatment takes place.

STATUS OF TREATMENT WORKS

The sewerage treatment works was designed in 1970's when the population was about 10,000 people; the current population is about 70,000 people, meaning the treatment works is not able to accommodate the current population.

The current production is averagely 5,500m³, production from private borehole owners is about twice the company's production meaning total production contributing to waste water is about 16,500m³, if all potential customers get connected to the net work the total waste water to be received will be approximately 75%*16,500 therefore 12,375m³ which is more than the current capacity of the waste water treatment works.

Raw sewerage

- Design capacity -1250m³/hr
- Received during wet season - 1015m³/hr
- Received during dry season - 800m³/hr
- Received during the night - 450m³/hr

Capacity

Sludge drying beds capacity -560m³

2 Pumps de-sludging capacity -30m³/hr

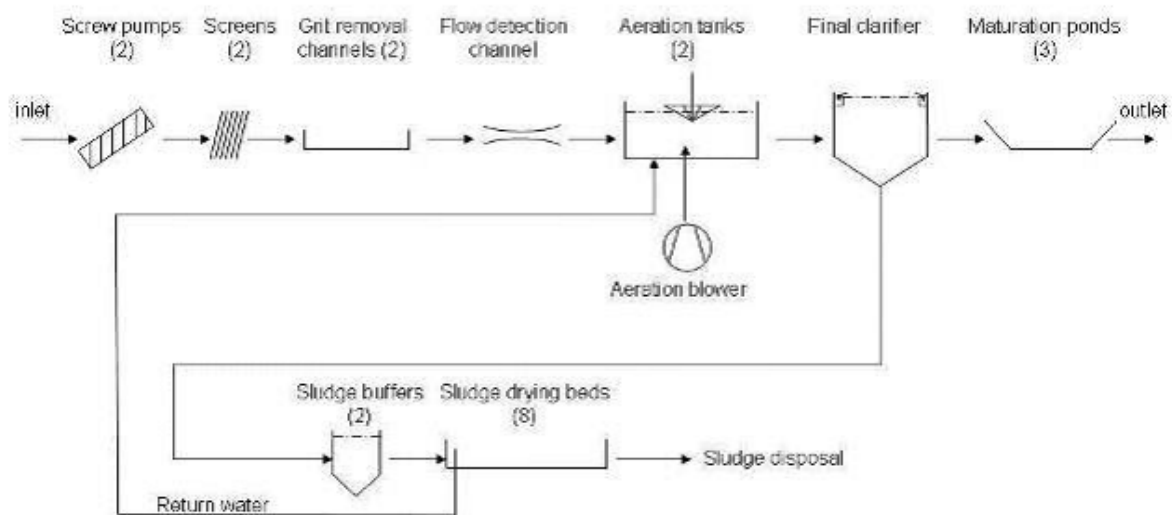
Above flows are tabulated as follows,

Flow=m³/h=Channel width (cm) * Water level (cm) * Flow velocity (m/s) *0.36

- Diagram showing aerial location of the treatment works.



Operations schematic diagram



The screw pumps are meant to lift the waste water to the screens; unfortunately they are down most of the time since they are old same to aeration blowers, sludge pumps and air compressor.

In respect to the design, the retention time between aeration bonds and discharge point should be 36hrs, this is solely depended on aeration efficiency, in order to improve on the discharge quality future plans are to construct the wetlands capacity 7,600m³ for further treatment of the effluent, this will increase the retention time hence better effluent quality.

Recommendations

- Roof top and storm water to be disconnected from the already overstretched sewer network at a cost of the customer.
- Structures erected on top of sewer lines to be removed at the cost of the customer.
- Sewer network size to be enlarged, recommendation the Rift Valley water Services Board to undertake the surveys and designs to come up with accurate BOQs .
- Raising the manholes which allow storm water in at an estimated cost of Ksh 200,000/=.
- Construction of screens in the critical manholes to trap non organic materials at an estimated cost of Ksh50,000/=.
- Purchase of high pressurized exhauster for rapid response in case of a sewer burst at cost of about Ksh25,000,000/=.
- Purchase of normal exhauster for exhaustion services at an average cost of 18,000,000/=
- Sewerage supervisor to be employed to keep constant monitoring of the treatment works and network at large.
- 90 degree joints in the network like the one at total petrol station to be eliminated.
- Additional network in the zones so as to reach all the potential customers.
- Lean personnel – Increase the technical personnel manning the both the sewer treatment works and network.

Summary Report by Ministry of Agriculture

DRAFT NATIONAL URBAN AND PERI URBAN AGRICULTURE AND LIVESTOCK POLICY- MAY 2010

Agricultural growth and development is crucial for Kenya's overall economic and social development. In Kenya urban areas are not only increasing but experiencing an upsurge of the people out for better livelihood as a result of rural-urban migration. However, urbanization is increasing without an equivalent improvement in infrastructure and services or poverty driven land use responses. Therefore the question of organized urban land uses will be critical and this includes urban and peri-urban agriculture and livestock (UPAL) activities.

The challenges that face the UPAL subsectors include:- land use, crop and livestock production, technology development, markets and marketing, safety of environmental pollution and provision of support services. The dissemination of new technologies is poor and there is no supportive legal and regulatory framework to govern the subsectors. These shortcomings have resulted in underdevelopment of the subsector.

The urban and peri urban agriculture and livestock (UPAL) policy is the sector's outline of policy interventions to be pursued in order to address current constraints and to improve the subsector growths and development. Policy aims at giving clear direction for sustainable development of the UPAL and underscores the importance of public private sector partnerships in accelerating growth in the subsectors. All the changes proposed in this policy paper will need to be supported by an appropriate legal framework.

One of the strategic objectives of the ministry is to create an enabling environment for agriculture through the review of the current policy and legal framework that would accelerate agriculture production on a sustainable basis. Thereby contributing more incomes, employment and food security. In the past urban agriculture used to be regarded as an insignificant cultural practice and was ignored by policy makers. However, the complexity of urban life with high poverty levels has led to increased agricultural activities in the urban and peri-urban areas and it is now seen as a livelihood strategy.

The policy addresses the key challenges in the sector. The overall objective of urban and peri-urban policy (UPAL) is to promote and regulate sustainable UPAL development to improve incomes, food security, create employment and reduce poverty to enhance living standards, with focus on land use, public health and environment. This will entail addressing the following areas: coordination and reviewing of policy and legislation affecting UPAL with the aim of developing concerted subsectors improvement. Strengthening and enforcing legislation to support UPAL development in liaison with the ministries of local government, public health and other industry players. Enhancing and strengthening of collaborations and linkages between institutions developing and promoting appropriate technologies for sustainable UPAL development.

Promotion of conservation of the environment by management of waste and other pollutants from the UPAL products through improved market, transport and information exchange. This policy document looks at the constraints to the development of UPAL with regard to policy, legal regulatory framework, environment pollution, crop and livestock production, technology development and dissemination, markets and marketing, safety of agricultural produce and products and land use. For each of these constraints the policy assesses and diagnoses the causes of these limitations and outlines specific intervention measures that will be undertaken in order to achieve the outlined policy objectives.

The policy explores and proposes an institutional framework.

Some of the available acts of parliament that support or hinder urban and peri-urban agriculture are as follows:-

- i. The local government Act (cap 265) local authorities in Kenya have the power to lease, transfer or allow land for company use (section 144) they also have the power (section 201) to make by-laws necessary to maintain residents health and safety and wellbeing, maintaining good rule and government...e.t.c.
- ii. Nairobi city council has used these powers to enact by-laws that prohibit cultivation on public streets and keeping livestock that create nuisance.
Section 144(c) of the Local Government Act also prohibits cultivation by unauthorized persons on land that is not occupied or land belonging to private persons e.t.c.
Section 155 (b) of the same act allows for agricultural and livestock undertakings and provisions of services to them.
Section 155 (c) provides the planting of famine relief crops by person to support themselves. In any part of the country where there is likely to be shortage of foodstuffs.

Field visit report

SUMMARY REPORT ON THE FIELD VISIT TO THE CATCHMENT

The following is an account of the findings made during the above visit by group six members on 4th February 2014.

Purpose: The purpose of the field visit was to investigate suspected sources of pollution in the lake Naivasha basin.

SITES;

1. NDINDA CENTRE

This is situated in Nyandarua County where one of the seasonal tributary of Malewa River passes. River flowing during the visit.

Findings;

- Women were washing clothes in the river
- There was oil floating on the water
- There was grease in the water
- Plastics, rotten fruits and vegetables, husks, fruit seeds, animal droppings and paper also noted dumped in the river

Slaughter house situated between Ndinda and Engineer centres

- The slaughters slab was placed on a sloping ground
- Waste water and blood flowing from the slaughter slab drains into the open and discharged into the adjacent farms through a channel that leads it into the river
- Oval content dropped in the compound
- Drains to and from lagoons broken and harbouring waste
- Flies breeding in large quantities

- Water was not flowing at the time of visit

2. KAYOLE DUMP SITE

Findings;

- The dump site was not fenced off
- There was free entry by animals and humans
- People were busy scavenging
- Haphazard placing of waste noted
- Open burning was also noted, smoke bellowing into the nearby school on leeward side (one 27 KAG academy)

3. KCC SLUM

- There were claims of waste water discharging into the river Malewa. On investigation however it was proved to the contrary.
- Open defecation was noted near the latrines at the back of the slum, overlooking Kenya co-operative creameries cooling plant

4. NAIVASHA SEWAGE TREATMENT PLANT

- Situated to the west of Kihoto estate on the lower side of Naivasha town
- Norma screening of waste water not done as pump had broken down, hence grit and sit finding their way into to lagoon
- One aerator was malfunctioning, only three were functional
- There was fear incompletely treated sewage could end up in the lake either directly or through underground seepage
- Submersible pumps for sludge tanks broken down, necessity manual removal of sludge
- Information given on proposed wetlands (2)

5. KAMERE LANDING BEACH

- Fish trade and other activities could discharge waste into the nearby lake
- The pit latrines at the site could pollute the lake water

6. KARAGITA

- Team inspected culverts, some of which were clogged which direct water from the slum into Lake Naivasha
- The storm water carries all types of waste into the lake
- The community jiko was also visited, team informed on its working mechanism; burning combustible solid waste to produce heat which heats metallic plates where residents prepare their food

First Group Meeting Minutes

Lake Naivasha Riparian Land Management

POLLUTION FROM THE CATCHMENT

Location: Imarisha Naivasha Board Room		Minute Rapporteur: Mbogo Kamau		
Date of Meeting: 20 th Dec.2013	Time: Start: 0930hrs Finish 1230hrs	File Ref: Lake Naivasha Riparian Land Management	Date of Circulation:	
Purpose	Group 6. Pollution from the Catchment			
Attendance	Name	Institution/Group	Phone No.	E-mail
	Absolom Mukuusi – Chairing	NPA	0720-096943	absolomj@yahoo.com
	Dominic Chege	Middle Malewa WRUA	0721-143182	dgiochege@gmail.com
	Guy Erskine	Sanctuary Farm	0721-346961	guyerskine@gmail.com
	Esther Mbuthia	AMUA/LANCONDO	0710-404974	Esthermbuthia78@gmail.com
	Dominic Mwangi	NAGGA	0721-672701	Mingos210@gmail.com
	Daniel O. OTHIM	BMU	0713-020699	---
	Njuguna Kamau	Chambers of Commerce	0727-988883	knjuguna@yahoo.com
	Julia W. Waweru	Wanjohi WRUA	0724-331865	Juliwaweru@yahoo.com
	EZEKIEL HUBES	MWIHANGERI SHG	0724-364847	Ezekielhubes@yahoo.com
	Kamau Mbogo	Imarisha	0722-315678	Mbogokamau2001@yahoo.co.uk kamaumbogo@imarishanaivasha.or.ke
Apologies	• Gray Hopcraft - Loldia • John Maina Kamau - Wanjohi Wrua • Daniel Maina - District Water Officer • Richard Fox - Imarisha			
Distribution	• All group Members • Governor’s Office • County Commissioner and deputy Commissioners Office • Sub-County Administrators Office			
	Preliminaries		Action By	Completion by
Meeting Agenda	The Chairman called the meeting to order and requested members to introduce themselves. He explained to the members the business as; • To develop the Terms of Reference (TOR) for the Committee			

	on Pollution from the Catchment - To identify the pollution issues that hinder sustainable management of Lake Naivasha and its riparian land. - Identify appropriate mitigation measures/actions to address the pollution issues		
	Terms Of Reference (TOR)		
	- Identify the key Pollution issues (Types & Sources) from the LN Catchment - Identify the Impacts of pollution - Provide recommendations/mitigation measures to control and manage pollution in the catchment		
Minute Number	Matters discussed		
1	Point Sources Pollution Sources and transport systems Include: Sewerage waste, waste canals, industrial waste, river systems, cattle pens on riparian land and slaughter houses (Ol-Kalou slaughter house discharging to tributaries of river Malewa and privately owned slaughter houses at Karagita, Kameere, Marula, Kongoni, Kasarani, Gilgil). -- Other Urban Centers within the Basin and on the beaches around the Lake. There is need for proper waste management in the urban centers and on the beaches. --Hospital waste, Learning Institutions and in the Markets – How do they dispose their waste materials? --Cattle pens and grazing ground around the lake. A lot of cattle is being held within lake and river riparian land and are a major source of pollution --Cattle kept within the estate Major threat is linked to the Naivasha sewerage especially due to bursts that occur along the network sewer lines – near the Orange shop, Council Estate -mostly due to the waste from prison where a sieve for solids has been broken Recommendation/Action: --NAIVAWAS --To replace the sieve along the prison sewer line to remove solid waste, undertake maintenance of the sewerage lines and conduct regular monitoring of the line. NAIVAWASS should let the committee know where they are facing challenges --Undertake expansion of the Naivasha Treatment Works to accommodate increased volume of waste from the entire Naivasha town.. -- Redesign the drainage system to control flush floods that run through Naivasha town during storm rains and expand the sewerage Network in Naivasha town. --The sewage to the Sewage Booster Pump Station has never been commissioned. Cannibalization of manhole covers undermines the capacity of the sewerage systems. The County Government to intervene to ensure the sewage pump station is handed over to the water and sewerage management company. --Create a drainage channel to realign surface floods from Kinangop plateau to flow into Karati river instead of flowing as open floods through Naivasha town.	All	22/01/2013

	--The Sub County government to undertake proper drainage planning for the Naivasha urban center and the surrounding areas --Naivasha Town Council to enhance waste collection and management system in town and on the beaches. --Improve sewerage and sanitation services and proper planning for infrastructure development especially in the informal settlements Review the By-laws and make appropriate recommendation to improve on waste management in town and regulate livestock keeping within the estates. -- Explore production of Fertilizer from the sewage and waste materials waste. --The Committee to make field visits around the Lake to appreciate the pollution issues.		
2	Non-point sources of pollution (soil erosion, agricultural effluents, urban runoffs, storm water, cattle grazing fields, wildlife grazing fields, acid rains – e.g. Olkaria & Eburru geothermal emissions). --Largely carried through the surface run-off especially in all the urban settlements --Most of the settlements and a large section of Naivasha town still use pit latrines which are a major source of pollution to ground water aquifers. -- There is poor monitoring of waste management and disposal systems within the town, some of which are located in the wrong sites. Recommendation/Action; --Construct proper drainage system within Naivasha and the surrounding areas --Sub-county government to regulate the construction and use of septic tanks and ensure that the required standards for construction and management of septic tanks and soak pits are included in plans. -- Visit to the farms to establish the state of waste management in the farms. --Adopt appropriate capacity, technologies and innovation for waste recycling and management --Copies of EIAs and Annual environmental audit reports and waste management strategies by the commercial farmers and developers to be distributed to the County government and Imarisha Naivasha. --Promote public education, awareness and sensitization on waste management	Chairman	22/01/2013
3	Types of pollution, potential sources and impacts in the basin --Organic – biodegradable organic matter-animal waste, human waste, dead animal/plant material, wood waste, --Human waste --inorganic- pesticides, fertilizers, fungicides, fuel waste, noxious gases – Olkaria , heavy metals, e-waste, plastic materials & polyphonies, metal waste, rubber waste, detergents from washing, --Potential sources are from Olkaria, flowers farms, Cable manufacturing factory, Keroche Breweries, Garages within Naivasha, Car washes- along the river and the riparian areas. --Major Impacts include lake water pollution especially nutrient loading Eutrophication, decline quality of water for economic uses, decline of aquatic biodiversity and products such as fish.		

4	Policies, legislation, rules relating pollution together with enforcement and compliance --The Committee appreciates that there are several national policies. Legislation and bylaws. – Dominic Mwangi and Absalom Mukuusi Obtain the document for the Committee for reference to ascertain if they adequately address the Pollution. --The Committee to Make Appropriate input to the Draft County By-laws on Pollution Control and Management --A Code of Conduct to be developed to control and manage pollution in the basin and all developers to subscribe to the CoC. Recommendation/Action: --Enhance enforcement of relevant policies, laws and rules by all the agencies concerned ---Promote education, awareness and sensitization of impacts of pollution and support initiative that improve compliance ---Undertake a monitoring programme on pollution in the basin. ---Adopt technologies for effective pollution and waste management.	Dominic Mwangi & Absalom Mukuusi	22/01/2013
5	Institutional arrangements for pollution management Institutions involved include; – NEMA, Sub-county office, Public health, Agriculture, Fisheries, KWS, Livestock, WRMA, NAIVAWASS, EDUCATION, The Institutions are weak in enforcing due to capacity in human resources, infrastructure, inadequate funding and lack of facilities and equipment. Recommendation/Action: --Committee to conduct Rapid assessment of the institutions to determine their capacity for effective management of pollution and waste materials- including policies, laws and regulations governing pollution management. --Committee to review pollution management technologies and practices in the Basin i.e. agricultural practices such as terracing, grass stripping, tree planting, hydroponics, constructed wetlands, landfills, treatment and recycling works for waste management- e.g. fertilizers, landfills, biogas production, solid waste separation and recycling, value addition, marketing etc --Recommend additional agriculture field extension officers to be recruited	All	
7	Education, Awareness and Information dissemination The Committee acknowledges that a lot of the issues are due to low levels of awareness and access to information by the public Action: ---Organize public barazas, seminars, talks, road shows, develop and disseminate publicity materials	All	28/02/2013
	Additional Resolutions		
	Recommendations for long term pollution control that the committee will also be looking into include; • Integrated land use and urban planning for the basin • Capacity building of small scale farmers –to adopt sustainable farming & good practices • Enhanced water stewardship in the basin (enforcement, compliance, good practice/modern and efficient technologies i.e. modern treatment technologies. • Develop and implement strategies for integrated pollution management -		

	Develop a Pollution Monitoring system that covers the entire basin.		
AOB	- The committee should draw a budget required to facilitate the activities of the group - Group Requires a detailed map of the area where they can plot pollution hotspots identified in the field		
	There being no other business –the meeting ended at 1330hrs.		
Next Meeting	Date of the next Meeting Wednesday 22 th January 2014 – 9.00am, Imarisha Board Room	ALL	

Second Group Meeting Minutes

Lake Naivasha Riparian Land Management

GROUP-6 POLLUTION FROM THE CATCHMENT

Location: Imarisha Naivasha Board Room		Minute Rapporteur: Anderson Koyo		
Date of Meeting: 22 nd Jan.2014	Time: Start: 0900hrs Finish 1200hrs	File Ref: Lake Naivasha Riparian Land Management	Date of Circulation:	
Purpose	Group 6. Pollution from the Catchment			
Attendance	Name	Institution/Group	Phone No.	E-mail
	Absolom Mukuusi - chairing	NPA	0720-096943	absolomj@yahoo.com
	Dorglas Bosire	NAIVAWASS	0722-995827	onsongodorglas@gmail.com
	Guy Erskine	Sanctuary Farm	0721-346961	guyerskine@gmail.com
	Esther Mbuthia	AMUA/LANCONDO	0710-404974	Esthermbuthia78@gmail.com
	Dominic Mwangi	NAGGA	0721-672701	Mingos210@gmail.com
	Daniel O. OTHIM	BMU	0713-020699	---
	Daniel Maina	DWO	0735234559	Mainadan65@yahoo.com
	EZEKIEL HUBES	MWIHANGERI SHG	0724-364847	Ezekielhubes@yahoo.com
	Patrick W Kingaru	MoH	0720-734568	patrickwanjoh@gmail.com
	Anderson Koyo – taking notes	Imarisha	0733-750518	andkoyo@yahoo.com
Apologies	• Gray Hopcraft - Loldia • Richard Fox - Imarisha • Njuguna Kamau – Chamber of Commerce			
Distribution	• All group Members • Governor’s Office • County Commissioner and deputy Commissioners Office • Sub-County Administrators Office			
	Preliminaries		Action By	Completion by
Meeting Agenda	The Chairman called the meeting to order and requested members to introduce themselves. He explained to the members the business as; • Review of previous minutes • Feedback from the previous meeting • AOB			
Minute Number	Matters discussed			
1	Point Sources Pollution – Issues and feedback • Field visits not yet done as it was logical to engage Naivawass before the field visits. • Naivawass not clear on specific purpose/objective of the			

	field visits – scope and what the team wants • Develop a budget and programme for the field visits Naivawass update & challenges of managing the treatment works; --The entire network from consumer level needs expansion – currently its outstretched. Only about 11% of the town is covered by the sewerage network. --Aeration of the treatment works is done only for 12hrs per day instead of 24hrs, while the waste is received throughout the day --Only three (3) aerators are operational while the forth one is still under repair --With the three (3) aerators operating at 12hrs per day, the power bills stands at Ksh. 240,000 per month. An approximated bill of between Ksh. 700-800,000/= would be attained if all the aerators were operational for 24hrs. Naivawass would not be able afford that bill. --The current capacity of the sewerage works' is low and cannot cope with the volume of waste that is coming in. The works requires urgent expansion to cope with the current demand and additional capacity for waste management for another ten years. --Constructed wetland should be done below the treatment works for further filtration --Current treatment does not meet the WHO standards that are based on a 24hrs treatment. --In many parts of the town, roof catchments have been connected to the sewerage network thus exuberating the pressure and leading to the sewerage bursting --In some cases solid waste is directly disposed in the open manholes leading to clogging and blockage of the sewer lines --challenges ---need for proper equipments for unblocking i.e. high pressure exhauster ---use of manual exhausting (unblocking rods) takes too long and not efficient --- need replacement with modern technology ---manhole vandalism has been a regular problem but has been brought under control through awareness campaign and involvement of police in investigation and prosecutions. Manhole vandalism had particularly led to high inflow of silt into the sewerage system. ---assistance from Vitens from the Netherlands is mainly to replace manhole covers and not new construction or expansion works Recommendations -Re-design and expand the entire network to cover the whole town and the peri-urban areas. -Naivawass wrote to RVWSB to undertake a survey and re-design the network to cater for present and future populations---make follow up -Notices have been sent to residents to redirect the roof catchment to the open drainage and avoid over-stretching of the sewerage system, -After unblocking the clogged lines Naivawass and the Public Health department should disinfect the areas around the manhole as required --Disinfecting- used to be done together with MoH though currently out of stock. Follow-up actions will be done to ensure it is done regularly.	All	
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	Reactions; The issue of re-designing the network has been discussed for over two years; when will it be addressed? The sewerage bursts that always occur next to the Total Gas Station – are caused by waste from Naivasha Prison. The population at the prison is over 3,000 and they use a lot of water and drop solid waste substances into the sewer line. Screens need to be installed to remove foreign objects from the network. Sewer Booster pump Situated in industrial area next to Aqua lodge hotel has never been commissioned. The sewerage pipeline that connected the booster to the network was uprooted during road construction. The Contactor who constructed the booster station is still on site and has not handed over the booster to the RVWSB or Naivawass. Ministry of Water and the County government should take appropriate action, inspect and verify the booster as per the original specifications, make payments and finalize the taking over by government. The Solid Waste Collection and Management service has been moved to Public Health Department. However the department is having inadequate staff that will affect its performance in the long run. Solid waste collection and management in Naivasha town has improved recently. Peri-urban areas like Karagita, Kamere and Kasarani still have no solid waste management services while the population in these areas continues to rise. Karagita is generating up to 20,000 tons of waste every day while only 16,000 tons of it is collected every week. Most of the open drainage channels from Kinangop pass directly through Naivasha town. There is urgent need to redirect the channels to flow into Karati river before reaching the town. This should be addressed within the context of Naivasha town planning. Alternatively, there is need to construct a Dam to hold and retain the flood water instead of letting it flow directly to the lake causing high silt deposition. Farmers and other land holders in the Kinangop region should be trained on sustainable agricultural practices including application of fertilizers and pesticides to avoid high nutrient loading in the lake. Solid waste management in the peri-urban areas (Karagita, Kihoto, Kamere, KCC, Kasarani) should be approached through a participatory PPP concept that creates a platform for all sectors to work together to address the challenges of solid waste management. The Public Health, MCN, NEMA, WRMA by-laws on solid waste management are in place. An education, awareness and -sensitization of the public on these laws should be enhanced to improve on compliance. The relevant ministries and agencies should also improve on their mandate and responsibility to enforce the laws, rules and regulations. Within the estates, engagement of landlords and tenants to take responsibility on solid waste management should be increased		
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	through intervention by PHD, MCN and public education and awareness. The landlords to provide bins/receptacles and tenants should ensure that all solid waste are separated and dropped in the bins Waste collection from the CBD and estates should be improved by the MCN and the PHD. -New building and construction plans in the town should only be approved if they have clear plans for solid waste management. Likewise, Completion and Occupancy Certificate should be issued only to completed buildings with adequate provisions for solid waste management.		
2	Non-point sources of pollution - issues --Industrial Area estate in Naivasha town depends largely on soak pits, pit latrines, septic tanks although the population in the area is very high. Recommendation/Action; -- network expansion to cover this estate --Naivawass- should develop a proposal to be submitted to the government and donors to raise funds for expansion of the networks, re-designing and expansion of the treatment works, establishment of a constructed wetland and other waste management facilities. --partnership (Vitens) – concentrate on maintenance of what is existing but not on new ventures (design, construction) -- WSTF has not provided funds for expansion or waste management in Naivasha for the last two years. There is need to follow up --PHD, MCN, NEMA etc should make regular visits to the farms, industries, and other institutions to inspect and verify waste management systems. --More public education, awareness and sensitization on solid waste management be promoted by the PHD, MCN and other agencies. Involve the Civil Society Organizations (NGOs, CBOs, SHGs) as appropriate.	Naivawass, PHD, DWO	
3	Field Visits to be done by the Group to the hot spots; --garages in town, --sewer treatment works, --ndinda centre, --dumping site, --kamere beach, --flower farm, --karagita, --KCC, -The chairman of the Group (Absolom) to finalize the field visit arrangements with Imarisha secretariat—Mr Mbogo. Field visit to be undertaken next week	Chairman	
4	Policies, legislation, rules relating pollution together with enforcement and compliance --The committee requested technical department to provide copies of the sectoral Policies, Laws and Regulations that govern waste management. (Public Health Act, EMCA 1999, MCN regulation, MoA act, Water Act, Physical planning Act, Land Control Act, Industrial Development Act, Construction Act). --The department (PHD, DWO and Naivawass) to produce an inventory of all the appropriate Laws, Rules and Regulations that govern waste management.	PHD, DWO, Absolom, Dominic Technical Officers from respective departments	10/02/2014

	They will also produce a summary report that highlights the gaps, challenges, technical capacity, inadequate staff, funding, equipment, good will, and constraints that hinder effective enforcement and compliance, and make recommendations on how to fill up the gaps and address the challenges. --Also provide reasons why enforcement of the Laws and Regulations is not up to date and why the public have low compliance rate. -Discuss the roles of County and National governments, private sector, CSOs, public and institutional frameworks that exist or should be in place for effective solid waste management. All reports to be availed in the next meeting		
4	Capacity Building, Technology transfers, Innovations, Education , Awareness and Information dissemination --What are the existing solid waste management innovations/technologies in Naivasha? Do they meet national/international standards? -Who is applying the innovation and technologies and where? --Identify gaps in innovation and technologies in Naivasha? Suggest how to fill in the gaps	All	10/02/2014
	Resolutions and way forward		
	--E-waste – management strategies to be developed to cover diverse range of electronic waste materials being disposed of in the Naivasha.	Technical officer, Technical Officers from respective departments, Chairman, Dominic	10/02/2014
AOB	There being no other business –the meeting ended at 1205hrs.		
Next Meeting	Date of the next Meeting Monday 10th February 2014 – 9.00am, Imarisha Board Room	ALL	

Last group meeting minutes

GROUP 6 – POLLUTION FROM THE CATCHMENT

DATE OF MEETING	TIME	START 0900HRS
10 TH FEBRUARY 2014		FINISH 1350HRS

PURPOSE GROUP 6: POLLUTION FROM CATCHMENT

ATTENDANCE.

1. Absolom Mukuusi - Chairing
2. Douglas Bosire
3. Guy Elskire
4. Gray Hopcraft
5. Patrick W. Kingaru
6. Esther Mbutia
7. Njuguna Kamau
8. Ezekiel Hubes
9. Dominic Chege
10. Daniel Maina
11. Dominic Mwangi – Taking Minutes

ABSENT

1. DANIEL O. OTHIM
2. RICHARD FOX

APOLOGIES

1. TOM KINYANJUI

MEETING AGENDA

The meeting was called to attention by the Chairman and after self introduction by the members he gave the day's agenda as

- i. Report from the field visit
- ii. Report by the departments i.e.
 - a. Naivawass
 - b. Ministry of water

The chairman informed the committee about the difficult he is facing in getting reports and acts of legislations from some government offices e.g.

- i. The town planner.
- ii. Environment office – sub-county
- iii. Ministry of agriculture
- iv. Wrrma
- v. Nema

And it was agreed that the chairman, the co-chairman and Mr. Njuguna would address this issue on 4th Feb 2014.

The field visit (by Mr. Patrick)

See the attached copy.

RECOMMENDATIONS

- 1) The Kayole dumpsite issue to be addressed as a matter of urgency

Centre	Issue fundings	Recommendations	WHO	Alternative
NDINDA	<i>See the copy provided</i>	Public awareness Law enforcement	Provincial administration P.H.O WRUA	WARMA Boda Boda groups
NDINDA SLAUGHTER HOUSE	<i>See the copy provided</i>	Share findings with the area P.H.O. Implementation of the new veterinary guidelines	Nema P.H.O Veterinary department M.C.A	M.C.A
KAYOLE DUMPSITE	<i>See the copy provided</i>	Purchase of bulldozer Identify disused quarries to be used as land fills. Compositing of waste Segregation and recycling of waste at the source. Fencing of the dumpsite Install an incinerator Education awareness	County Government Line ministries	Groups dealing with waste management M.C.A
K.C.C. SLUMS	<i>See the copy provided</i>	Public awareness Public private partnership Relocation of the slum dwellers	Provincial administration	M.C.A.
SEWER TREATMENT PLANT	Broken machinery (<i>see copy attached</i>)	Repair the machinery Hire more staff Construct a wetland Modernize the entire facility	The water company The county government	Area M.C.A
KAMERE LANDING BEACH	(<i>see the copy attached</i>)	Have a clear management plan in all the landing beaches	Sub county planner P.H.O. Fisheries Dep	Area M.C.A.
KARAGITA	(<i>see the attached copy</i>)	Public awareness Enforcement of the sub-county by-laws Enhancement of garbage collection Community jiko to be replicated in other areas	P.H.O Sub county Community groups	M.C.A

- 2) Naivawass report
Presentation by Mr. Bosire
(see the attached copy)

RECOMMENDATIONS

- i. Overhaul of the whole system as it only serve 11% of the total population of Naivasha
- ii. Purchase of a high pressure exhauster
- iii. The aeration to be done 24 hours a day.
- iv. Purchase of new and modern aerators and screw pumps.
- v. Construction of a wetland (urgent)
- vi. The engineer to supply the committee with the current electricity bill.
- vii. Hiring of more staff i.e.
 - a. S. Supervisor
 - b. Quality person
 - c. Treatment works supervisor
 - d. Operators
- viii. The residents to be advised to use the Electro Micro organisms (E.M)technology in their septic tanks and pit latrines
- ix. Naivawass to account for the waste of the 89% population that never reach their treatment plant.
- x. The engineer to make a comprehensive report.
- xi. The engineer to arrange for a meeting with Sarah Higgins, Ruth and Eugene so that they can share the information they have regarding the sewerage in Naivasha

Report from district water officer

- i. It was reported that no record regarding the booster pump is in his office so Mr. Njuguna promised to share with his office the information and records he has regarding with same pump.
- ii. The contractor is said to be ready to complete the work and even waiver some cash if he can be approached.
- iii. The two reported that the 10 million which was received from the government during the 2012 / 2013 financial year was used to expand the sewer network by 2.4 km and also that 100 pipes were burned by five at their premises.
- iv. Though the expansion was done no connection have been done to date which the D.W.O. told the committee that connection is the mandate of the Naivawass and the P.H.O.

3) PUBLIC HEALTH REPORT

The public Health Officer informed the committee of the ongoing plans to address the county public Health issues at the county level of which Imarisha Lake Naivasha Board has been identified as a key stake holder.

He was asked to provide a copy of the recommendation they have made as the Naivasha sub-county P.H.O. to the committee.

On the capacity building, technology transfers, innovation and education the committee recommended that all the initiatives by the groups dealing with waste management should be supported.

E-WASTE

It being a major challenge the committee agreed to research on it through literature and internet.

The meeting ended at 1350hrs with a word of prayer from Esther Mbuthia

GROUP 7: VEGETATION DESTRUCTION-

CONVENOR-ANDREW KOISAMOU: 0722793843

ISSUE IDENTIFIED AND PROPOSED WAY FORWARD

VEGETATION DESTRUCTION INCLUDES CUTTING OF ACACIA TREES AND OTHER PLANT MATERIALS ON THE RIPARIAN LAND

Extensive tree destruction is taking place around Moi Southlake road and Parts of North Lake among other areas.

Natural tree falling in public lands:

Acacia trees are falling naturally due to increasing Lake water level. There is also natural tree falling on private properties. Such trees should be allowed to decompose and recycle the nutrients back to the soil.

Action

- Seek guidance from Naivasha Sub-County forest officer on what the Forest policy and Forest Act states on the management of fallen trees and how the same may be disposed of (guidelines on management of fallen trees)
- Review the licensing procedures for tree cutting on riparian land and seek support from the local administration officers i.e. DCC, DOs and Chiefs.
- Establish tree nurseries to raise seedlings for planting on the riparian land
- Engage farmers, land owners, BMU, tour operators and local schools in tree planting on the riparian land and adjacent areas.
- Produce alternative sources of charcoal i.e. briquettes from farm waste materials
- Identify research projects to show alternative cheap and safe energy sources
- Develop a proposal for Biogas Production projects at the BMU landing sites and in Naivasha Prison.
- Develop and implement appropriate technologies and innovation that promote sustainable energy sources (Biogas, Solar, Wind energy)
- Establish Agro-forestry and wood lots for fuel wood supply to local communities
- Create awareness on importance of vegetation

Papyrus destruction:

Papyrus destruction around the Riparian Land is taking place due to reasons which include Agriculture, Construction, Boating, Fishing, Hotel views, Livestock and Wildlife grazing

Proposed Action

- Incorporate institutions to undertake and coordinate management of papyrus
- Encourage private land owners to be involved in conservation and protection of papyrus.
- Reach out to Chiefs and MCAs to disseminate information and create awareness on papyrus conservation
- Undertake restoration of degraded papyrus sites by replanting papyrus where appropriate
- Reduce over grazing by livestock and wildlife and avoid wild fires on the riparian land.

- Discourage creation of unofficial corridors and entry points to the lake
- Engage Leicester University Research team to promote floating papyrus on the lake

Eucalyptus and other species not required on riparian land:

These include invasive species and others not considered sustainable in wetland zones. Eucalyptus species should be removed from the riparian land as per the Gazette Notice signed by the Cabinet Secretary, Ministry of Environment, Water and Natural Resources.

Overgrazing:

Overgrazing within the riparian land has been attributed to two causes: wildlife and livestock. Loss of natural wildlife habitats due to human population pressure has forced higher density of wild animals on riparian land resulting in overgrazing and soil erosion. Likewise, higher numbers of livestock on riparian land has contributed to over grazing and damage to the habitat including loss of papyrus.

GROUP 8: SECURITY:

CONVENOR: JOSEPH GITHAE 0723769999

Terms of Reference

- Identify security issues in the Lake Naivasha Riparian Land
- Develop mitigating strategies to overcome security issues.

The following were identified as the Security Agents in Naivasha:

The Kenya police, Provincial administration, County Government, Kenya Wildlife Service (KWS), Kenya Forest Service (KFS), Water Resources Management Authority (WARMA), Fisheries Department, Kenya Maritime Authority, The Community Groups (Land owners, LNRA, LNGG, Conservancies etc); Private sector operators, The Citizenry.

Issues of Security in Lake Naivasha Riparian Land

The security situation the Lake Naivasha Riparian Land was discussed and found to be of great concern in terms of General security and lack of collaboration between the community/people and the security agents. Source of threats to the Riparian land security were identified as follows:

Environmental security issues: Wildlife poaching, Human-Wildlife conflicts, Fish poaching, Tree felling for firewood, charcoal and construction. Overgrazing, Cattle rustling, (ii) **Human threats** e.g. Rape, Assault, Murders and general theft of property (iii) **Infrastructure threats** which include vandalism of physical infrastructure like fence, transformers, telephone, electrical wires and building materials, (iv) **Threats to Tourism**-Robberies on tourists e.g. cameras and other personal items.

Reasons why crime has not been adequately contained by the Security Agents include:

Inadequate personnel; Low operational budget ; Lack of equipment to detect, investigate and deal with complicated crime; Lack of collaboration among the land owners and between land owners and the security agents; Lack of security alerts and sharing of information among property owners; Conflicting land use systems—pastoralism and farming; Lack of animal identification mechanisms that would help curb livestock theft.

Recommendations on how to deal with the issues of insecurity:

- Establish security reporting systems (installations and networks) that harmonize security information and alerts among stakeholders and institutions in the riparian land.
- Sensitize the citizenry on their role as detectors and reporters of crime and on the indivisibility of peace and security. Improve citizenry access to information on security issues.
- Address the issues of planning, income generation and livelihood opportunities among the communities in the informal settlements of Kamere, Karagita, Kasarani, K.C.C, Kihoto etc.
- Ensure restoration, effective management and regulation of access corridors.
- Remove fencing and obstructions that hinder free movement of wildlife around the riparian land. Water channels and canals are obstructing free movement of wildlife on the riparian land.
- Kenya Maritime Authority should open an office in Nakuru for them to monitor the safety of boats in Lake Naivasha.

- Demystify the issues of security through interactive programmes; it is believed that security is a monopoly/preserve of the police. Embrace the Nyumba-Kumi initiative
 - Ensure that stakeholders are involved in formulation/implementations of security by-laws at the county and sub-county levels.
 - The central and county governments should deal with the question of informal settlements which pose a major security threat in most parts of the riparian land.
 - Establish a security database using a questionnaire detailing all security issues from all Riparian Land players on the status of security in their farms/businesses. Assess the training needs for the security personnel
 - The County should consider branding animals and moveable assets like boats as per landing beaches using colour codes for ease of identification and regulation.
-
- Establish advanced warning system, a proactive approach that will deter crime
 - Design an enforcement and coordination strategy of all security players in the riparian land

GROUP 9: WEAK ENFORCEMENT

CONVENER: SEAN MWEDA

TERMS OF REFERENCE (TOR)

1. Identify causes of weak enforcement
2. Determine mitigation measures to weak enforcement

CAUSES OF WEAK ENFORCEMENT

- Inadequate capacity of WRMA to effectively enforce Water laws, rules and regulations. This includes inadequate technical personnel, financial/budgetary allocation, equipment and transport.
- Inadequate capacity of WRUAs to compliment WARMA in the enforcement. This includes weak governance structures, lack of accountability, weak technical capacity and skills on water resources management. Knowledge and information gaps include water balance within the basin to guide informed water allocation and permits to users.
- Lack of access to information, poor communication system within the majority of Wruas.
- Inadequate knowledge of water policies, laws and rules amongst the various stakeholders.
- Lack of reliable database on the water resources, inventory of the hydrological and monitoring data.
- Conflict of inter-sectoral policies and regulations in the management of the integrated water resources. There is also lack of clear understanding on the roles of national and county governments in the management of water resources in the basin.
- Very low and non deterrent penalties for the offenders

Recommendations on how to address weak enforcement

- **Inadequate capacity of WRMA to effectively enforce water policies, laws and rules:** Deploy adequate technical staffs at WRMA Naivasha sub region. Allocate adequate financial resources, equipment and transport to the sub-regional office to effectively manage various responsibilities.
- **Inadequate capacity of WRUAs to compliment WARMA in enforcement:** Support development of institutional capacity of Wruas to execute their mandate on water resource management. Institutional capacity building should include governance, accountability, transparency, communication, project management and reporting skills.
- **Inadequate technological capacity to execute various functions:** WRMA to finalize water balance study, carry out inventory of all abstractors under various categories, provide standardized abstraction meters, and establish water quality monitoring and a database to enable wruas and stakeholders access to information for decision making.
- **Inadequate knowledge of water regulation laws and rules amongst the players:** Conduct public education, awareness and sensitization on water resource management and the roles and responsibilities of various institutions i.e. wruas, farmers, industries, land holders and all other water users.
- Develop an integrated water resource management strategy (plan) through harmonization of the various policies, laws, regulations and land use systems. Train wruas on conflict management and resolution skills. Establish multi-sectoral working groups to manage water resources and involve stakeholders in decision making

- **Lack of clear understanding on the roles of national and county governments in the management of water resources:** Educate stakeholders on policies and legislation regarding devolution of water resource management and the separation of authorities and mandates between the national and county governments. Contribute to the development and implementation of the County government policies, laws and regulations on water resources management. Conduct public training and awareness creation on devolution and how it relates to water resources management.

**GROUP 10: WILDLIFE MANAGEMENT ON RIPARIAN LAND:
CONVENER: SARAH HIGGINS-- 0723786007**

TOR:

1. Identify the key issues in the wildlife sector within the Lake Naivasha riparian land
2. Recommendations to resolve issues in the wildlife sector

Key Issues

9. Wildlife carrying capacity on riparian land, destruction/fragmentation of wildlife habitat and populations (cutting of trees, destruction of papyrus, soil erosion, waste disposal)
10. Wildlife Access corridors and migratory routes
11. Private and Community Conservancies and Wildlife/avifaunal biodiversity hotspots on riparian land
12. Enforcement/Compliance Wildlife poaching, patrols protection of wildlife
13. Role of KWS & Communities on management of wildlife on riparian land
14. Unregulated tourism activities on riparian land
15. Equitable sharing of wildlife related benefits for conservation of the ecosystem
16. Education, awareness creation and access to information
17. Urban Planning

Recommendations on resolution of wildlife issues on riparian land

- **Wildlife carrying capacity, destruction/fragmentation of wildlife habitat and populations (cutting of trees, destruction of papyrus, soil erosion, waste disposal)**

Excessive wildlife populations cause over-grazing, soil erosion, worms and diseases in the animals. Wildlife corridors be kept intact or re-opened to reduce the load on riparian land. The riparian zone be kept intact and in its natural state as wildlife habitat. The exception is buffalo which must be controlled to avoid overgrazing to the riparian land. The carrying capacity of the riparian land should be researched. No introduction of invasive species. Protection of wildlife through enhanced enforcement/compliance, sharing of intelligence and proper management of human-wildlife conflicts are all important issues to be addressed.

- **Wildlife Access corridors and migratory routes**

Wildlife within the riparian land should be managed appropriately and populations maintained within appropriate thresholds to prevent destruction of the habitat. These corridors should not be used by humans as this frightens off the animals. All fences, farming activities and buildings on riparian land should be removed so that the animals have free access to the lake, riparian land and beyond. A corridor connecting Hell's Gate Park to Lake Nakuru Park through Eburru, Elementaita and the local ranches be set up as a way of expanding the wildlife dispersal range, ensuring a healthier population and reducing the density of wildlife on the lake shore.

- **Role of KWS and Communities in Conservation of Wildlife on riparian land**

The riparian zone should be gazetted as a wildlife conservancy or sanctuary managed and regulated by the local community and stakeholders in partnership with KWS-particularly to ensure proper enforcement of the laws and regulations. Wildlife management on riparian land should be zoned into tourism designated areas as well as wildlife (waterfowl/ fish) foraging and breeding sites. Wildlife management should recognize the fact that Lake Naivasha is a Ramsar site -a Wetland of international importance, a designated Important Bird Area, a national asset and one of the few natural freshwater reservoirs in Kenya. Hoteliers should be sensitized to stop cutting papyrus to increase the view of the lake. Birds need

the papyrus and the riparian trees. Dead trees have a role to play in the lives and breeding of birds and insects and should be left in situ and not immediately turned into firewood or charcoal.

- **Enforcement, Compliance, Unregulated tourism activities on riparian land**

At present there is a lot of unregulated tourist activities on riparian land. Tourists are being taken round, and out in boats, by untrained and uninsured operators and guides. There is need for regulation of this important industry. The boats that take tourists out often go out at night either for illegal fishing or for other nefarious purposes. They are a security risk and should be regulated. A tourism association should be set up for all the tour operators and a code of conduct drawn up to govern their operations together with a stronger enforcement of the laws and regulations.

- **Equitable sharing of wildlife related benefits within the ecosystem**

Hotels, tourist boats, fishermen and local farmers are all benefiting the local people by providing employment and livelihood opportunities. Use of the water hyacinth should be promoted as it is a renewable source of nutrients for livestock, makes a good compost/mulch, and can be turned into paper and other products. This could start a cottage industry to help many poor people. Transient pastoralists need water for their cattle but the cattle do so much damage to the riparian land, it is strongly recommended that livestock be provided water away from the lake. Grazing the riparian land is not an option as over grazing has already reduced the wetland buffering capacity.

- **Education, awareness creation and access to information**

The LNRA already has a library set up which is available to anyone who wishes to learn about the lake. This library is being digitalized by Imarisha and soon will be available to all. There is also a new book being produced which brings together all the information about the lake in 'layman's' language (and hopefully later in Kiswahili) so that the information is easily available to people of all walks of life. Education and awareness activities should be enhanced to ensure that all stakeholders receive the right information about the lake, natural resources and related socio economic values and functions.

- **Urban Planning**

There is serious need for Naivasha town planning so that certain areas are not built upon in order to allow wildlife free access to the lake and beyond. Water needs to be taken to the communities so that there is no longer any need to do laundry in the lake thus polluting it. There should be proper waste disposal both liquid and solid so as to avoid dumping in the lake and riparian land. Watering points for community water supply should be set up away from the lake for cattle.

Conclusion

The Groups have positively taken up their responsibilities and engaged in very constructive discussions where important issues and mitigation measures have emerged. The Groups reports have been consolidated into this report to be submitted to the Governor and stakeholders. The exercise created an opportunity for all stakeholders to be participating and contribute to the strategies for sustainable management of the lake, riparian land and the entire ecosystem. This will ensure long term environmental values and services as well as the related socio economic benefits and livelihood opportunities for the communities are sustained. We hope to host the second Governor-Stakeholders Conference in May 2014 to discuss the reports and agree on the way forward.

ADDENDUM TO GROUP 1: ACCESS CORRIDORS

Some corrections need to be made on the issue of access corridors.

The physical planning map drawn up in the year 2000 was just a proposal for development purposes and was not an approved survey map.

We have tried to contact John W Simiyu who drew up the map to no avail.

We have despite consulting all stakeholders not found or seen a single map or title deed showing any access corridors/roads around lake Naivasha that have specifically and clearly been demarcated as public access but we know there are several areas currently being used or are under dispute which are;

1. Kongoni
2. Kamere
3. Kasarini x 2
4. Sanctuary
5. Kihoto
6. Adjacent to NSC (recently closed and under dispute)
7. Adjacent to Naivasha Country Club (under dispute)
8. Opposite Wildfire Farm (under dispute)
9. Lentolia (under dispute)

Therefore the recommendations must be that:

1. Current areas being used as public access are identified, surveyed and the land owners contacted in order to initiate negotiations by which the GoK can acquire and gazette the land for future protection. In some cases it may be so that the land in question is already owned by GoK but the same process of demarcation and gazettelement should be applied.
2. In areas where a public access corridor does not exist and the distance to the nearest public access corridor is deemed an inconvenience then access to water should be provided by lake front land owners to the public either through physical access to the lake or by pumping of water to a publically accessible facility. The exact distances between areas where lake water has been made available need further debate.
3. Public access corridors should not be considered in areas that connect or form part of existing wildlife corridors/conservation zones but in such cases water should be made accessible (see previous bullet point).
4. Areas currently under dispute will have to be referred to an appropriate authority for arbitration (to include NEMA).
5. No new public access corridors should be opened without an EIA first having been conducted by the authorities.

Chairman,

Alasdair Keith