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Climate Change resilience: A civil society governance approach in Kenya

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Abstract

Water Resource Users Associations (WRUAs) are civil society organizations playing critical role in water resource management in Kenya. The association is anchored in the Water Act 2002 as community based organisation whose membership is voluntary and constituted by water users and riparian owners in a defined watershed. The Act provides for co-management in water resources. The challenges facing water resources management in Lake Naivasha are closely associated with climate variability and environmental degradation associated to climate change. In the last two years, WWF, the government agencies and other stakeholders have enhanced the capacity of the Lake Naivasha Basin (WRUAs), enhanced and have successfully developed strategies and modalities to respond to climate change and enhance community resilience to climate change impacts through the development of water governance mechanisms at the local level. One approach used by the Basin WRUAs is to develop and enforce local rules between the downstream large scale water users, pastoralists and upstream small holders agricultural communities that strictly ensure water equitable access and allocation under water stressed conditions. This has forestalled possible fierce conflicts between the pastoralists, large-scale water users and smallholder agricultural communities along the Malewa, Gilgil and Karate rivers in Lake Naivasha basin Kenya. The WRUA members in collaboration with the law enforcement agency, the Water Resources Management Authority (WRMA) conduct joint inspection of water intakes especially during the dry season to enforce the laws. This paper reviews WRUA approaches that ensure that strategies are put in place for the ecosystem they depend upon for water supply and livelihood improvement is climate resilient and the communities and the ecosystem are able to respond to impacts of climate change.

Keywords

[Climate change, resilience, civil society, governance, Water Resource Users Associations]

1 Introduction

Lake Naivasha is a significant freshwater resource in a relatively water deficit area in Kenya. The Lake was designated Kenya's second Ramsar Site (wetland of international importance) since 1995. At 1887 m a.s.l., it is the highest of Kenya's Rift Valley Lakes, and covers an area of about 145 km² and lies on the floor of the Rift Valley located at 0° 46' S and 36° 21' E. . It has fresh water which is unusual amongst other Rift Valley lakes which are sodic (IUCN, 2003, Gathenya, 2007).

Apart from the invaluable freshwater that supports wide range of biodiversity, the Lake also supports large and vitally important economic activities- mainly irrigated horticultural farming, fish industry, tourism and wildlife, drinking, recreation and generation of geothermal electricity. In 2007 91,000 tons were exported compared to over 93,000 tons exported in 2008 (Kenya Flower Council, 2011). The value of flower exports rose from about Kshs 1 billion in 1990, to Kshs 23 billion in 2006, to a record high of Kshs 43 billion in 2007 (Kenya Flower Council, 2011). In 2008, the value of exports stood at Kshs 40 billion. (Kenya Flower Council, 2011).

Natural resources (land, forests, wildlife, fish stock and water) found in L. Naivasha landscape are the main foundation for socio-economic development in the basin. Lake Naivasha catchment receives an annual mean rainfall ranging between 800mm - 1600mm while the lowland receives 500mm. However, over the years the intensity and distribution of this rainfall has been fluctuating significantly affecting the hydrological flow regimes of the Catchment Rivers. The prevailing environmental degradation, coupled with climate variability in the landscape is contributing to observed decline in natural resources and escalation in poverty among the rural communities who are natural resources based. The communities living in the basin have not waited for these challenges to take toll on their livelihoods, but through WRUAs have developed local rules and guidelines that drive them to become resilient to climate variations.

This case study reviews experiences and lesson learnt on how L. Naivasha basin Water Resource Users Associations adapts to climate change perturbations while safeguarding their livelihoods. It further appreciates the role of water resources associations in safeguarding and managing the water resources using existing indigenous knowledge.

1.1 L. Naivasha Basin Description

The topography consists of the higher areas on the slopes of Aberdares and Kipipiri ranges where elevations go upto 3990 m a.s.l. near Ol Donyo Lesatima peak on the Aberdares (Gathenya, 2007) and 3360 m a.s.l. on the top of Kipipiri . The lake, the elevations is at 1890 m a.s.l (Gathenya, 2007). The central part of the basin is the plateau region which is flat to undulating and slopes are below 10%. The river cuts deeply into this rather flat area in several places giving steep river banks where the slopes are over 30%. The hillsides are also mountainous with slopes exceeding 30% (Gathenya, 2007).

1.2 Climate change and water resources

Growing human demands for water coupled with the impacts of climate change are altering the quality and availability of fresh water, which increases the difficulties of securing water to support socioeconomic activities such as agriculture and urban development as well as protecting the life-supporting functions of freshwater ecosystems. Climate change is disproportionately affecting the Africa development trajectory, as most African countries are characterized by differentiated economic structures, poor infrastructure, fragile governance structures and institutions, poor human development and most importantly, the heavy reliance on sensitive sectors such as agriculture for the majority of the rural population (African Development Forum VII, 2010).

Climate change variability in Kenya has continued to threaten its economic growth which is dependent on natural resources and which is central to development and poverty reduction (Wit, 2006). This is directly through the effects of changing water availability, loss of biodiversity, declining and volatile agricultural yields, climate-related humanitarian disasters (including floods and droughts) in various regions, increased incidence and prevalence of vector-borne diseases (malaria, East coast fever), weakened infrastructure, political instability due to heightened conflict over resources especially on the highland areas and lake regions, and movement of people (African Development Forum VII, 2010). Warm temperatures also lead to faster depletion of the limited oxygen supply in waters, negatively affecting fisheries, and limiting Lake Overturn (Fick et al., 2005; Chase, 2006).

The effects of climate change are more severe to the vulnerable and marginalized groups in the society, including women and children who spend most of their time doing natural resource based activities to safeguard the livelihoods of their families. Women are not only victims of climate change, but also effective agents of change in relation to both mitigation and adaptation (52nd session Commission on the Status of Women, 2008).

The freshwater ecosystems of East Africa are vulnerable to climatic changes through the propagation of three main types of water stresses:

- lack of sufficient water for prolonged periods of time (droughts),
- excessive water for short periods of time (flashy floods), and higher evapo-transpiration losses.

Lack of intervention, it is likely that the ecosystems will be driven to change from one dominated by the so-called equilibrium species, rich in biodiversity, to one dominated by low diversity opportunistic species that would thrive in a variable, unstable and unpredictable climatic regime. The effects of minor levels of climate change are already being felt, with impacts across many economic sectors. While there will clearly be some gains from climate change (for example, agriculture in some highland regions should increase in productivity due to a rise in temperatures), most of the impacts will be negative, and gains and losses will not be evenly distributed.

Rising global temperatures are leading to an intensification of the hydrological cycle, resulting in dryer dry seasons and wetter rainy seasons, and subsequently heightened risks of more extreme and frequent floods and drought. Changing climate will also have significant impacts on the availability of water, as well as the quality and quantity of water that is available and accessible.

In L. Naivasha Basin, the scenario is no different, climate change has had significant effects on the natural ecosystems and consequent impacts have been felt by all water users in the basin. This has been evidenced by several extreme events experienced in the country such as 1997, 2000, 2004/2005, 2009 severe droughts and 1997/1998, 2002, and 2010 severe floods that led to massive conflicts over resource use and thousands of people and livestock affected to death in the country.

Lake Naivasha which is the economic hub of the basin is surrounded by intensively irrigated agricultural land that depend largely on the lake and groundwater and a town whose population is growing very rapidly due to the employment opportunities created by the flower industry and the geothermal production company. The rivers and groundwater sources within the watershed provide water supply to Naivasha and Nakuru townships and adjoining human activities. This increasing water demand coupled with climate variability calls for appropriate water governance structures that ensure equitable water allocation in the basin for socioeconomic development and nature conservation. Civil societies involved in water governance in the L. Naivasha basin have demonstrated there are opportunities in addressing the water use issues amicably and sustainably.

2 Water Resources Governance

Broadly defined, governance refers to processes and structures for social coordination and collective decision making. It deals with questions of who decides and how? – that is, in the context of a given issue, who are legitimate actors, what are their interests, and what is the process for resolving disparate views among these actors and interests? Governance deals with the roles and activities of various actors and institutions, and interactions among them.

Effective planning and implementing climate change adaptation for water resources requires the engagement of a lead agency (Water Resources Management Authority) and water users represented by Water Resource Users Associations (WRUAs), alongside the Ministry of Agriculture, to ensure strong government support. Adaptive and flexible management is essential. The broadening nature and increasing severity of potential climate impacts in a given area and the unavoidable uncertainties associated with predicting these impacts require innovative approaches to management and development that go beyond centralized prediction and control practices. Therefore an appropriate balance between public sector efforts and incentives, such as capacity building, and private investment, needs to be struck so that the burden can shift away from poor communities

2.1 L. Naivasha basin water institutions governance Achievements

In Kenya, water resources are governed through the Water Act 2002, which mandates Water Resources Management Authority to take lead in management of the resources on behalf of the government of Kenya. The Water Act 2002 section 15 allows for stakeholders who are water users to participate in the water resources management. In this case, all water users come together to form water users associations. The Water Resources Users Associations (WRUAs) are mandated by the Act to manage the resources at the grass roots level and to ensure catchment protection. In L. Naivasha basin, the WRUAs who are civil society groups, ensures that available water resources is shared amongst the various users equitably without comprising environmental flows. In pursuit of ensuring this is achieved, the WRUAs have adopted various climate resilient approaches that have reduced conflict over water use during the dry seasons. Among the approaches include but not limited to:

2.1.1 Water Allocation Plan

Water allocation Plan is a management tool comprising of rules and procedures through which access to and use of water is determined and controlled. Historically, water allocation systems have focused primarily on efficient and equitable allocation of resources among human uses such as agriculture, power generation, and municipal water supply, with fresh water viewed primarily as an input to economic production. As human water demands continue to grow, allocation systems undermining ecological limits are beginning to adapt to the need to secure water specifically for sustaining ecosystem integrity. This is after realizing that the challenge for water governance expands beyond allocating water among human uses to broader decisions regarding allocation of water to serve both direct human uses (i.e., for domestic needs, agriculture and

industry) and requirements for maintenance of ecosystems and the many goods and services they provide.

For a long time in Naivasha basin water scarcity and growing pressure to secure water for ecosystems has resulted in increasingly complex and troublesome decision making regarding the allocation of water resources. In a quest to address this recurring challenge in the basin, L. Naivasha stakeholders developed and adopted a Basin wide Water Allocation Plan as management tool for water resources. The Water Allocation Plan for the basin has been simplified to allow easy understanding of the allocation in the basin more so during the dry seasons. The Water Resources Users Associations (WRUAs) in support of other civil society organizations, and government institutions arrived at using a traffic lights system to indicate the water use limits during the different water regimes for easy resource management. The different water regimes limits are indicated by four colours: Green (Satisfactory) – Users are allowed to abstract water as per their abstraction permits with no restrictions; Amber (Stress) – reduced irrigation and large-scale water users abstraction amounts; Red (Scarcity) - Abstraction for irrigation is heavily curtailed and domestic use reduced; Black (Reserve) – Abstraction for human needs only -**Figure 1** (Water Allocation Plan, 2011). The Water Allocation Plan was based on the water balance models for Naivasha that demonstrates that a possible deficit in 2030 if management issues are not addressed- **Figure 2** (Water Allocation Plan, 2011).

This simple management tool is a climate change adaptive measure adopted by the civil society organisations and water stakeholders in Naivasha basin. It will reduce conflicts over water resource use amongst and between large-scale horticulture growers, pastoralists and small scale farmers while securing environmental flows.

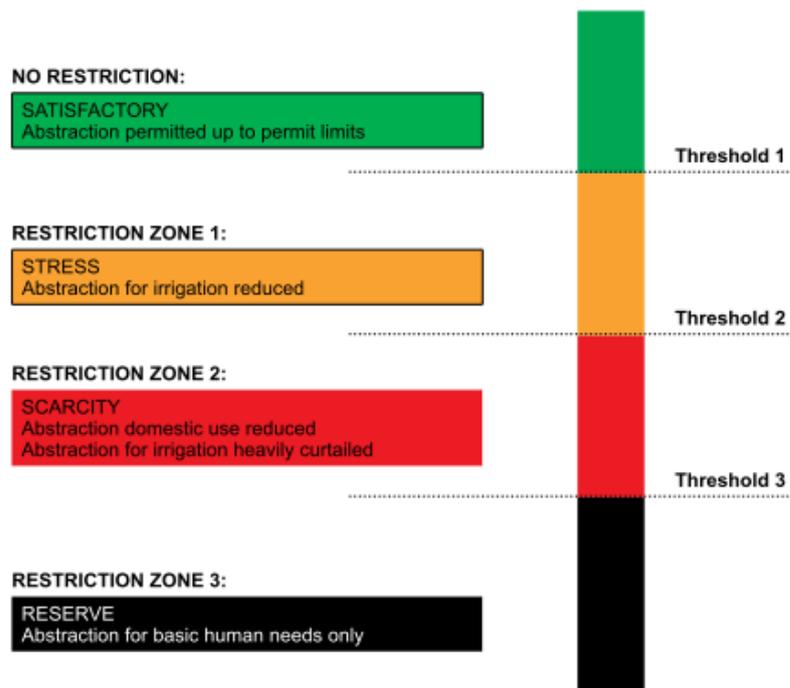


Figure 1: Abstraction Restriction Zones.

Source: Water Allocation Plan, 2011

Table 1: Availability Vs domestic demand (m³/day)

RESOURCE AVAILABLE FOR ALLOCATION	GILGIL	TURASHA	MALEWA
Reserve	1,469	39,658	58,320
Normal flow	3,974	24,105	38,534
Flood flow	9,591	67,911	123,984
Domestic demand			
2006	1,357	15,626	30,939
2016	3,343	18,695	36,769
2031	4,371	22,989	44,757
Water Balance with respect to Normal Flow			
2006	2,617	8,479	7,595
2016	631	5,410	1,765
2030	-397	1,116	-6,223

Source: Rural Focus 2006; Water Allocation Plan, 2011

2.1.2 WRUAs Sub-catchment management Plans

Sub-catchment Management Plans (SCMPs) are water catchment management tools developed by the WRUAs and comprising of strategies for increasing water availability in their respective sub basins. In L. Naivasha basin, the WRUAs have adopted this measure to adapt to climate change. Among the strategies in the SCMPs is development of communal wet season water storage infrastructure, households' soil water retention structures, rehabilitation of degraded catchment areas, rainwater harvesting facilities and building common abstraction points along the rivers. Implementation of these water strategies by the WRUAs have enhanced water availability and reduced water use conflicts during the dry seasons amongst and between pastoralists who live in semiarid areas southwest of the lake, large-scale horticulture farmers around the lake and upstream small holder farmers. The wet season water harvesting and storage measures have enhanced climate resilience because during the dry season, the WRUAs can access water for domestic and small scale irrigation improving their livelihoods.

2.1.3 Water abstraction data and revenue collection

Water resources are highly vulnerable to climate change because of poor governance and compliance by the users. When good governance structures (bottom – up management approaches) are established, the resources become well managed and available during both extreme seasons. One such approach is devolvement of revenue and data collection authorities to grass root institutions. WRUAs in the basin have lobbied the Water Resources Management Authority to devolve water use revenue and water abstraction data collection to them. With support of WWF and other stakeholders, the WRUAs have been appointed as agents for revenue and data collection. This strategy has empowered the WRUAs to manage water resources at the grass roots while ensuring water security in the sub-catchments. From the revenue collected, the WRUA are entitled to 15% of the revenue for administration, and field operations. Through this approach, the WRUAs are now assured of climate change resilience as abstractors will become more responsible through compliance of water allocation plan 2011, water rules 2007 and water Act 2002.

2.1.4 Gazettement of L. Naivasha Catchment Area and Groundwater area

As a water management tool, the civil society organizations in collaboration with private sector and water resources management authority developed policy that would govern the groundwater resource. This is to ensure the resource is safeguarded from over use in a changing climate. This is one of the measures that WRUAs have adopted and embraced with an assurance of sustainable water conservation in the basin.

2.1.5 Payment for Environmental Services scheme (PES)

Payment for Environmental Services (PES) is a market based scheme whose rationale is that downstream beneficiaries of environmental service should provide incentives to upstream land managers for the services resulting from voluntary conservation efforts. Conservation efforts includes rehabilitation and maintenance of riparian zones, establishment of grass strips and

terracing along steep slopes, reduction of fertilizers and pesticide use and tree planting which results in improved quality and quantity of river water. The upstream land managers/owners, who are small scale farmers, are therefore the producers and sellers of the environmental service while the downstream water users are service buyers and consist of economic entities such as flower farms, tourist establishments and government related institutions.

In L. Naivasha basin, WWF and CARE implemented this scheme with WRUAs through a mutual agreement in form of legal contract between buyers Lake Naivasha Water Resource Users Association (LANAWRUA) and Upper Turasha-Kinja and Wanjohi WRUAs on behalf of farmers in respective areas. This measure has been widely adopted in the basin and is working towards securing enough water of good quality for socioeconomic development nature conservation. Among the achievements of this scheme in Naivasha basin include: soil and water conservation structures on farms that yielded to soil erosion control and improved land productivity due to soil moisture retention. This has led to farmers increase in crop production and consequent livelihood improvement. Availability of on farm fodder for livestock is reducing pressure in the forest where most small scale farmers depend on for livestock grazing. Through this, farmers now have more time to undertake more productive activities that improve their livelihoods while milk production increases; the scheme has contributed to increased forest and vegetation cover on farms which contribute to increased water percolation increasing ground water recharge while reducing surface runoff from farms. This scheme has improved the resilience of agricultural communities to climate change while providing watershed services to the large-scale growers around the lake.

3 Conclusion and recommendation

Improved water resources governance in L. Naivasha basin has enhanced climate resilience of communities in the basin. When the grassroots civil society institutions develop rules, which thereafter are adopted and entrenched into governing policies; the institutions become more aggressive in management of the resources sustainably. Civil societies in Lake Naivasha basin have demonstrated commitment and aggressiveness in climate change resilience initiatives to secure the natural resources and investments in the basin.

However, the civil societies need further capacity building on policy harmonization so that they can be able to lobby for policies harmonization especially with the new constitution.

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