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Full Length Research Paper

Ratification of the Ramsar convention and sustainable wetlands management: Situation analysis of the Kilombero Valley wetlands in Tanzania

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In recent years, the Kilombero Valley wetlands in Tanzania was designated and added to the Ramsar convention's list in an attempt to improve its social, economic and environmental values. This study, carried out in selected sites within the Kilombero Valley wetlands, uses a participatory approach to analyze the existing situation and to reflect upon the quest for sustainable management as defined by Ramsar convention. The empirical findings reveal that the Kilombero Valley wetlands are an important source of livelihood for 87% of the dwellers in the area. Moreover, the wetlands also contribute significantly to welfare outside the area as 70% of the country's hydropower depends on water regulation functions of this wetland and they are the source of a diverse number of streams, adding to their biological and ecological value. The study furthermore revealed that the current institutional arrangement for the site threaten the sustainability of the wetlands, despite its addition to the Ramsar convention's list. A more detailed study on appropriate incentive mechanisms for the sustainable management of the wetlands, which would help to internalize the negative effects created by the users, is recommended.

Key words: Wetlands, sustainable management, incentive mechanisms, institutions.

INTRODUCTION

Wetlands are among the world's most biologically productive ecosystems, usually rich in species diversity. Nevertheless they are often undervalued and consequently mismanaged, leading to their degradation (Turner et al., 2000; Baron et al., 2002; Schulte-Hostedde, 2007). In Tanzania about 10% of the land surface is covered by various wetland systems ranging from deltaic mangrove formation to lakes and river flood plains. Due to their high fertility and moist soil, wetlands in Tanzania usually have a high potential for agriculture and contribute significantly to rural livelihoods in terms of cash and food security. In a country such as Tanzania where about 80% of the people are rural poor and depend on agriculture for their livelihoods, wetlands are therefore very important (MNRT, 2004a, 2007). However, due to differences in environmental and socio-economic conditions in Tanzania's rural communities there are significant variations in the patterns of use between the various wetland systems. These variations exist due to differences in the existing interactions between humans and the ecosystems (Hanna et al., 1996; Ostrom and Schagler, 1996; Ostrom, 2005; Hagedorn, 2008). The resulting patterns are complex and have an impact on the natural performance of the wetlands. This impact varies from place to place depending on the extent to which local communities are in contact with or dependent on the wetland resources.

Most wetlands in Tanzania are in fairly good conditions, although some like the coastal mangroves deltaic formations, the Kilombero Valley, the Pangani River and the Usangu plains are highly degraded. A thorough understanding of the causes of this degradation and the possible measures to revert the situation is important to

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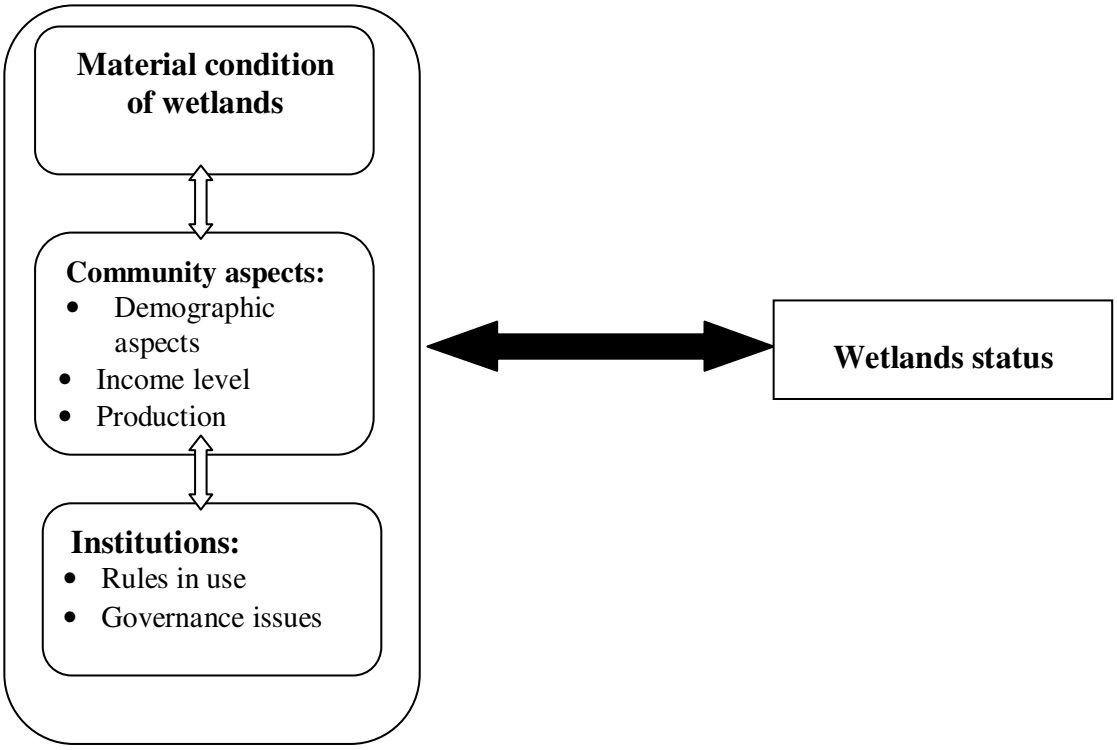

Figure 1. Conceptual frame work for situation analysis of Kilombero Valley wetlands. Source: Authors' construct with much contribution from IAD and IoS frame works.

avoid further degradation (Munishi and Kilungu, 2004). In order for the country to continue having these vital resources for economic development there should be a wise use of wetland resources through sustainable management (ESP, 2003). The Government of Tanzania (GoT) has shown its commitment towards wise use and recognition of wetlands as significant natural resources with important ecosystem services and biological values by ratifying the Ramsar convention on wetlands in August, 2000 (ESP, 2003; MNRT, 2004a). Together with efforts towards wise use as the Ramsar convention (1971) suggests there are still limits and challenges in attaining such objective. Some of the limitations and challenges include compromise between the long term and short term benefits based on the fact that short term solutions might provide a burst in income over a short time period but are seldom sustainable (Fischer, 2002; Baron et al., 2002). On the other hand, long-term sustainable planning and utilization is often more difficult, although it has been proven to give the largest and continuous benefits over time. The later is widely used according to Ramsar convention, but to the rural poor where their focus is on day to day survival, it is a great challenge.

Although some studies have already been conducted with regard to problems of wetland ecosystems in Tanzania and elsewhere, few have concentrated on explaining why the existing interactions between humans and wetland ecosystems have continued to be the cause of degradation of these ecosystems even after the country's ratification of the Ramsar convention. Moreover, Ostrom (2007) argues that most existing studies regarding degradation of common pool resources, from which wetlands are a special case, have used simple linear models which are not able to thoroughly explain the existing complex pattern of variations in their degradation. It is in this light that this study comes with some insights on why and how such interactions impact on the sustainability of wetlands. Kilombero Valley wetland, one of the most prone wetland to degradation in Tanzania, is used here as a case study. This study will be useful to inform the policy process and other development agents concerning issues to be considered when designing strategies for sustainable wetlands management.

THEORETICAL FRAMEWORK AND METHODS

A conceptual framework for this study (Figure 1) has been developed based on an extensive literature review and the authors' firsthand knowledge of the context in Tanzania. The resulting framework is closely related to the Institutional Analysis and Development (IAD) framework by Ostrom (2005) and the Institution of Sustainability (IoS) framework by Hagedorn (2008). The IAD model introduces a specific set of variables regarding persons, institutions and the physical world, which constitute the important drivers of the unsustainable wetland resources management causing the degradation in the Kilombero Valley wetlands.

Moreover, in the IoS framework it is claimed that when people interact with their physical environment through rules and existing governance structures, these interactions have impacts in both directions.

This means that while humans design the rules governing these interactions, sometimes the nature itself determines what kind of rules suits these interactions, thereby ultimately determining if the status of the wetlands is sustainable or unsustainable. On the other hand the status of the wetlands has an impact on the status of the communities' welfare which then affects the material condition of the wetlands.

The study area

The situation analysis was carried out between September 2009 and January 2010 in Kilombero District of Morogoro region where the Kilombero Valley wetlands which contain the largest freshwater wetland at low altitude are situated. The region is in the eastern part of Tanzania. The wetland area is located between the Udzungwa Mountains and the Mahenge escarpment. The valley is divided by the Kilombero River and falls within two districts (Kilombero and Ulanga). The wetland area covers 7,967 Km^2, with a catchment's area of about 40,000 Km^2. Many rivers, permanent and seasonal, feed the floodplains (Figure 2). The area is characterized by a sub-humid tropical climate with relative humidity ranging from 70 to 80% with an annual rainfall of about 1200 to 1400 mm. It has two rainy seasons: a long rainy season in March to May and a shorter one around October to December. Temperatures normally vary from 20 to 30°C (MNRT, 2007).

Sample selection

The target population comprised all primary users of the wetlands in the Kilombero Ramsar site. These were further categorised into local people, a group of companies and organizations which enjoy the products and services of the wetlands. For the locals a sample size of 5% was picked from the total household population in nine randomly selected villages (Sonjo, Mofu, Idete, Mahutanga, Kivukoni, Milola Mwaya, Sanje and Kikwawila) in Ifakara and Ulanga Districts in Morogoro region. The sample consisted of 160 households and for this case the sampling frame was a village and sampling unit was a household, defined as all people living under one roof and are sharing the same pot for cooking their dishes. The companies and organizations were randomly picked to represent all the companies and organizations, who are primary users or managers of the wetlands.

Data collection

Secondary and primary data were collected for this study. The secondary data sources included web resources, scientific papers and documents from NGOs and Government departments. The primary data was collected to fill in the gaps to whatever was not found from secondary data or when those data appeared to be out of date. The primary data were obtained through a Participatory Rural Appraisal (PRA) as a standard social survey data capture tool combined with semi structured questionnaires and checklists.

During the surveys, various wetland beneficiaries were contacted, including local communities in the selected areas, relevant NGOs and Community Based Organizations (CBOs); companies and enterprises. Qualitative data were collected through the appropriate PRA technique to understand the situation of the wetlands in terms of location, utilization, perception, trends and conservation aspects. Focus group discussions with key informants were also used in this aspect. Quantitative data were obtained by questionnaires and literature surveys, yielding information on wetland related products and services. This provided understanding on the way these products and services benefit the users and how the daily use of the services and products impacts on the wetlands' sustainability.

Data analysis

The analysis is mainly based on the conceptual framework, with as main assumption that wetlands would be functioning at 100% capacity if there would not be any anthropogenic activities. The exploration of human activities and their impacts can thus be used to assess the biophysical condition of the wetlands. While the community is the central point of these interactions, the attributes of the community have also been explored to quantify their impacts on the status of the wetlands through the rules established and the governance structures.

RESULTS AND DISCUSSION

Biophysical analysis of wetlands

Wetlands offer a variety of products and services to local households living in and around the valley. When respondents in the area were asked about the services and products having impact on their welfare and the rank of the products and services according to their usefulness and importance in their daily life, water for domestic use was ranked first, wetlands as source of food and cash (agricultural crops and fishing) was ranked second and the third was wetlands as sources of timber and non timber forest products. The ranking of these top three was the same in six of the nine surveyed villages indicating that these are the most important wetlands related products and services for the communities in Kilombero Valley. These three most important products and services are therefore referred to in order to explore how the access to and use of the resources have impacted the biophysical state of the wetlands. The average ranking of other products and services in the eight villages is listed in Table 1.

Wetlands as source of crops production

Crop production in the Kilombero Valley flood plain is practiced both at small and large scale. For several years as documented by MNRT (2004b) the plain has attracted a number of large scale farming investors. Their relative importance and distribution is presented in Figure 3a and b. Of the total area under cultivation only 23% is cultivated by small scale farming. An estimated 87% of all the people living in the valley depend on this area for their livelihood. The farming is usually done individually and sometimes in association under private farms. Majority of these farms are small, with an average size of 1 ha. About 10% of the farmers have landholdings exceeding 4 ha. The land is primarily acquired through inheritance, purchase or through allocation by the village

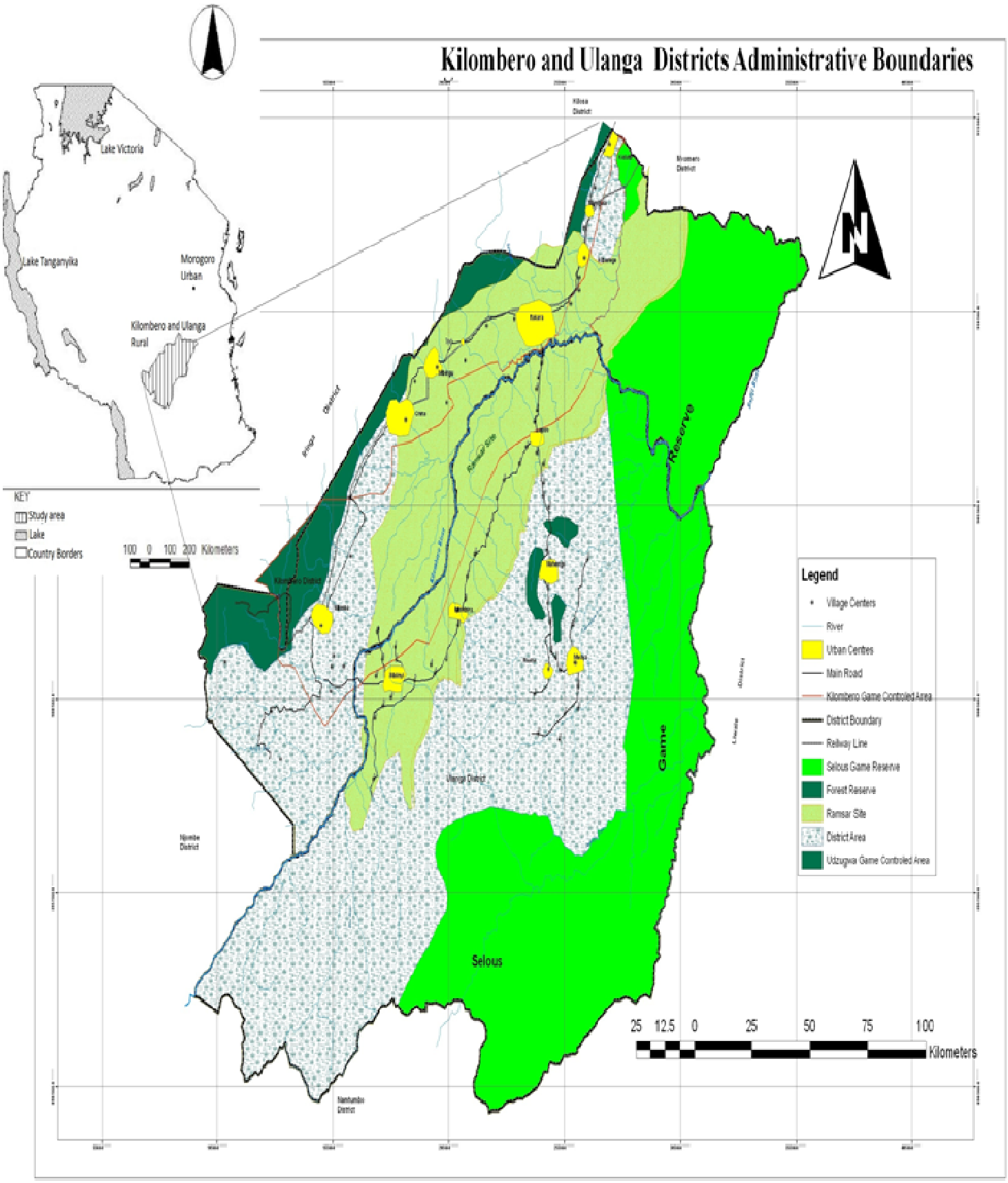

Figure 2. The map showing the location of Kilombero Valley Wetlands in Tanzania and the administration boundaries (KVRSP, 2009).

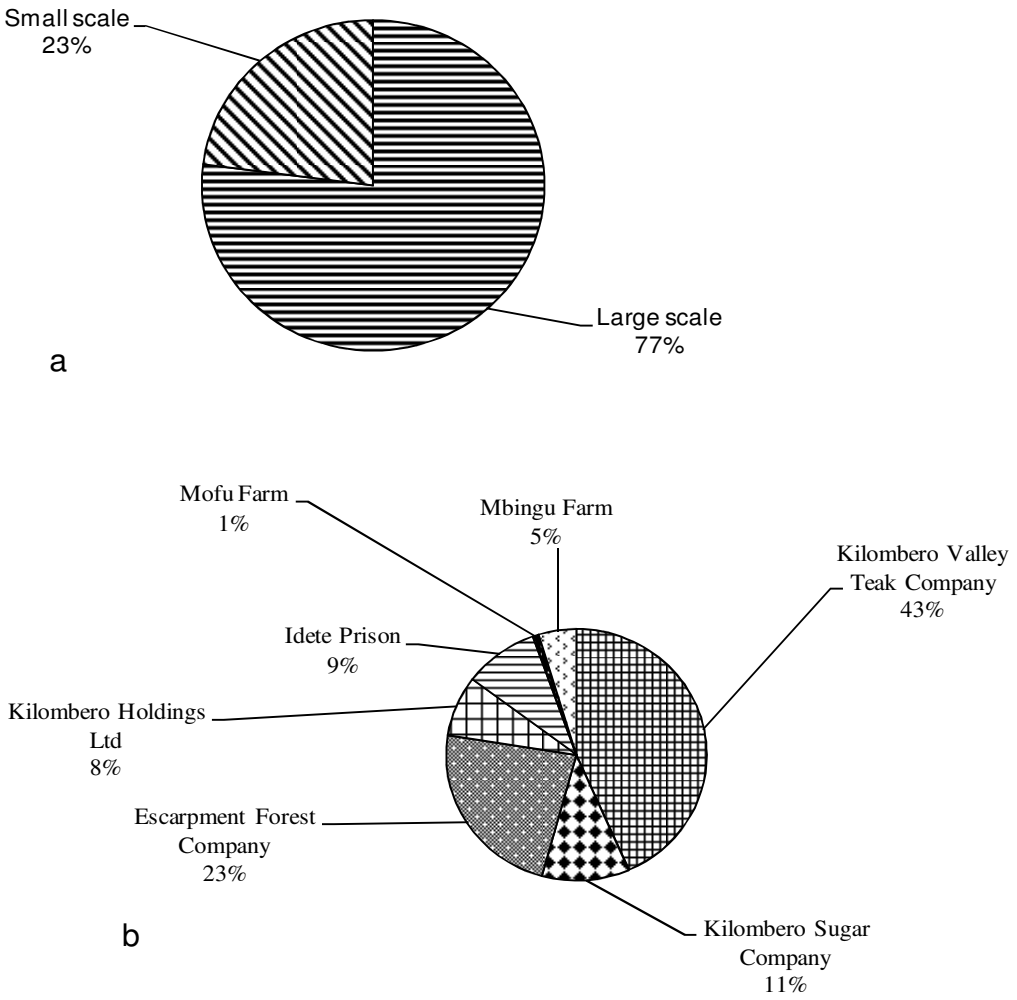

Figure 3. (a) Distribution of cultivated Land in Kilombero Valley, (b) Proportion of land holdings amongst large scale farmers in Kilombero Valley (Source: MNRT, 2007).

Table 1. Product/service rank by respondents in Kilombero Valley wetlands communities.

Rank	Product/service
1	Source of domestic water
2	Source of food and cash
3	Source of timber and energy
4	Grazing
5	Habitats
6	Cultural practices
7	Wild game
8	Source of non timber forest products
9	Provides burial grounds

governments, but sometimes it is also rented from owners.

The major food crops cultivated in the Kilombero Valley include maize, paddy rice, banana, and cassava. Cash crops include sugar cane, and paddy rice. Other minor crops also used as sources of food and supplemental income include sweet potatoes, corn, vegetables, peas, pigeon peas, groundnuts and sesame. Some figures on the yields and farm gate prices of selected crops in the harvest season are presented in Table 2

Due to the practice of shifting cultivation, the emergence of large scale farming and population growth, currently more than 50% of the flood plain is converted into agricultural land. At this moment, some people are even cultivating areas which were previously considered marginal, such as the river banks and around the swamps. As a result of this, there is increased soil erosion, which has resulted into siltation of downstream hydro power dams and also causing the drying up of streams and swamps. Several permanent streams, such as Kiberege, Idete, Kikwawila, Namawala and Idandu, in the past, are now only flowing seasonally. Furthermore there is speculation that water pollution and depletion are increasing due to the use of pesticides by the large scale farmers.

Table 2. The amount of agricultural crops obtained from wetlands and their prices.

Product (crop)	Amount per Season^{-1} Ha^{-1}	Selling price	
		(TAS Unit^{-1})[b]	US$
Paddy rice	25 bags	30,000.00	23
Maize	10 bags	42,000.00	32
Sugarcane	75 tons	35,000.00	27
Banana	375 bunches	2,750.00	2

[a]TAS 1300 is equivalent to 1USD (2010), [b]1Bag is equivalent to 100 kgs.

Wetland as source of domestic and industrial water

Kilombero River is the main source of water for the wetland adjacent communities. The river connects Kilombero District and Ulanga District. The river is fed by 10 tributaries originating from the Udzungwa Mountains. It flows in the Rufiji River, which is the biggest river in the country. There are several sources of domestic water and it was revealed by the interviews that a household can get water from multiple sources. However, the majority (83%), of the local people use yard tap water for domestic purposes, whereas less than 20% of the sampled households have a private connection. These percentages vary depending on the season of the year since the water from tap is not always available especially in dry seasons. At these moments they use water from other nearby sources such as community wells and streams.

Productive water use in the area mainly constitutes irrigation in the large scale farming of sugar cane and rice. The estimated costs of irrigation water per cubic meter are 20 TAS (1TAS is equivalent to 1300 USD). This includes all expenses in irrigation such as water pumping, labour and electricity.

Wetlands as source of energy, timber and non – timber forest products

Most respondents claim to be using energy from various sources, depending on the availability and on the purchasing capacity of the household. Often different energy sources are used in combination, although the majority depends mainly on fire wood and charcoal for their cooking (Figure 4). Most of the people use kerosene for lighting and a negligible proportion (1%) uses electricity.

It is striking that the area which produces 70% of the countries' electricity only a small minority (1%) has access to electricity in their houses. In this way the local communities do not appear to have particular benefits from electricity production and hence the significance of the wetland in terms of power production.

Lusambo (2009) states that the households' overwhelming dependency on wood as energy source has negative environmental consequences. Based on the model developed by Lusambo (2009) the wood fuel consumption in the study area is unsustainable, estimated to be causing a net deforestation ranging between 3.37 and 21.59 ha day^{-1}. The most recent statistics on deforestation rate in Tanzania are those provided by Butler (2006) and UN (2007). In both cases deforestation is estimated to be about 410,000 ha year^{-1}. Household energy consumption is an important determinant of this trend but another important cause of deforestation is timber harvesting. To reverse this deforestation trend timber harvesting is prohibited in reserved parts of the wetlands and only firewood collection by women and children is allowed.

Furthermore, various programs on tree planting around homesteads have been introduced to reduce the pressure on the parks' resources. Notwithstanding official claims that these programs have been successful, we observed that except for fruit trees the amount of trees planted on the homesteads was limited. This observation is also supported by Kajembe et al. (2008) and Munishi and Mbeyale (2009) who specifically pointed out that while tree planting programs by the park authority stressed on planting the trees for fuel wood the needs of the local community was not solely for fuel wood but also for timber. In fact the fuel wood was seen to be a secondary need. This could be expected, because the local communities can still legally get fuel wood from the park through the existing arrangement and therefore due to tight regulations and probably high enforcement the need for timber and poles as raw materials for shelter is considered as a more pressing need by the local communities. Notwithstanding the increasing deforestation, still an extensive timber resource exists outside the forest reserve, although there had been illegal logging for many years which has resulted into removal of all important trees for timber. While illegal pit sawyers target individual and vulnerable trees leaving a good forest cover, the opening up of areas for agriculture is reducing the area of woodlands significantly (URT, 2005).

Finally, we have to note that there is also large scale production of timber which is mainly done by large companies. The data from MNRT (2004b) shows that the Kilombero Valley Teak Company (KVTC) owns 28,159 ha (Figure 3b) in the valley on a lease of 99 years for timber production, mainly through teak plantation. However, to establish the plantations the company cuts down

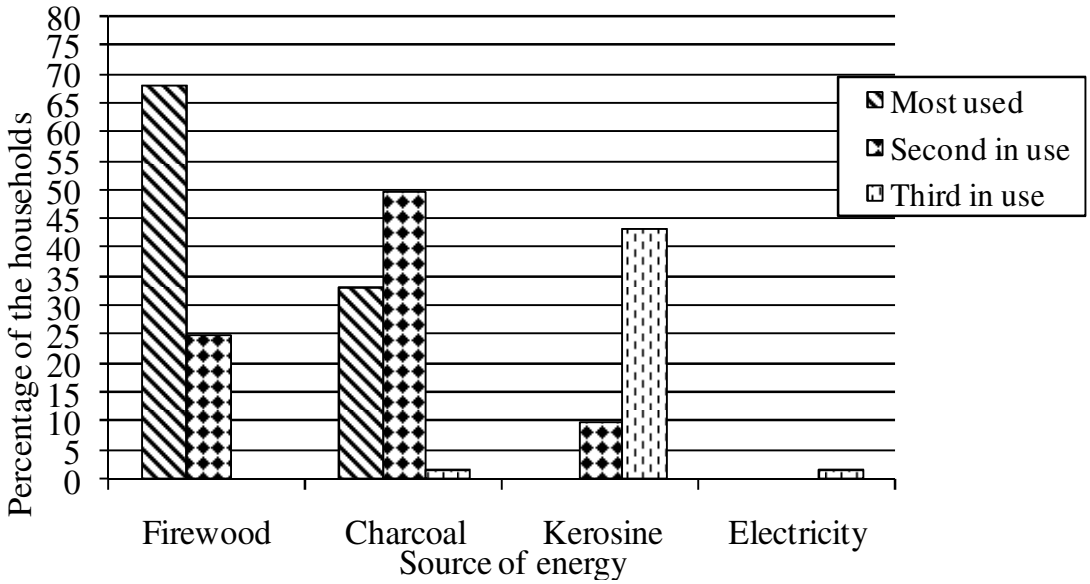

Figure 4. The ranking of energy used by the local communities in the wetlands.

indigenous woodland. This clearly has a negative effect on the wetlands' ecosystem.

Locals also obtain non-timber products such as bee products and reeds for weaving. The production volume for bee products is very low for example one of the associations in the area known as Miombo beekeepers Association with 300 beekeepers produces only an average of 5,000 Kg of honey and 500 Kg of bees wax from 613 beehives. Also the weaving is done on a very small scale (5%). Nevertheless such activities are important areas to look at as in most cases non-timber forest products are environmental friendly therefore an intervention on this as wise use (Ramsar, 1971) activity could be an important incentive for wetlands management if other users could contribute as compensation to the replacement of the activities which are very detrimental to the wetlands ecosystem.

Fishing activities

Fishing is one of the important economic activities in the study area. The fishing population depends on the location of the village with reference to the distance to the river and the flood plain. Following this, in some of the villages such as Mofu many people depend on fishing as their major economic activity. It is revealed by the study that fishing is negatively affecting the integrity of the wetlands in Kilombero Valley due to the way it is carried out. It was observed that due to occasional decrease in fish stocks (Figure 5), the fishermen in Kilombero Valley have developed techniques which destroy the integrity of the wetlands.

An example of a fishing technique is abstracting water from the swamps to reduce the water level which makes the fish easy to catch. This activity is carried out in the dry season and also involves planting reeds across the water inlets of the swamps to prevent too much water from entering in the swamps. Furthermore the fishermen also destroy the breeding sites of fish by uprooting the important vegetation called "Makongo" which are used by fish as their breeding sites. As a result to these destructtions, many swamps are claimed to dry up since the "Makongo" are also argued by the locals to prevent swamps from drying up during dry seasons. Furthermore this type of vegetation are claimed to prevent erosion along the river banks. Finally the locals argue that the vegetation has a kind of close relationship with the fish as its existence also depends on the availability of the fish in these water bodies. Although these claims need scientific verification the arguments are valid ecologically as this is also supported by other scientific findings as revealed by De Leo, and Levin (1997) and McClanahan (1999).

The destruction of breeding sites has resulted into the disappearance of a number of fish species and in the reduction of the quantities of others. The data with the trend of catch per species also suggests that fishing might be done in an unsustainable way as there is a shift after some time to a different species. These findings are also supported by claims from locals that some of the preferred species have decreased in availability forcing them to focus their efforts on other species (Figures 6 and 7). The species that appear to have disappeared are the *Heterobranchus longofilis*, *Citharinus congicus, Synodontis maculipiana* and *Labeo coubie*. Those that decreased in quantity are such as *Bagrus orientalis*, *Hydrocynus (*sp*), Alestes (*sp*), Distichodus fasciolatus* and an endemic species "Njogu" which we could not

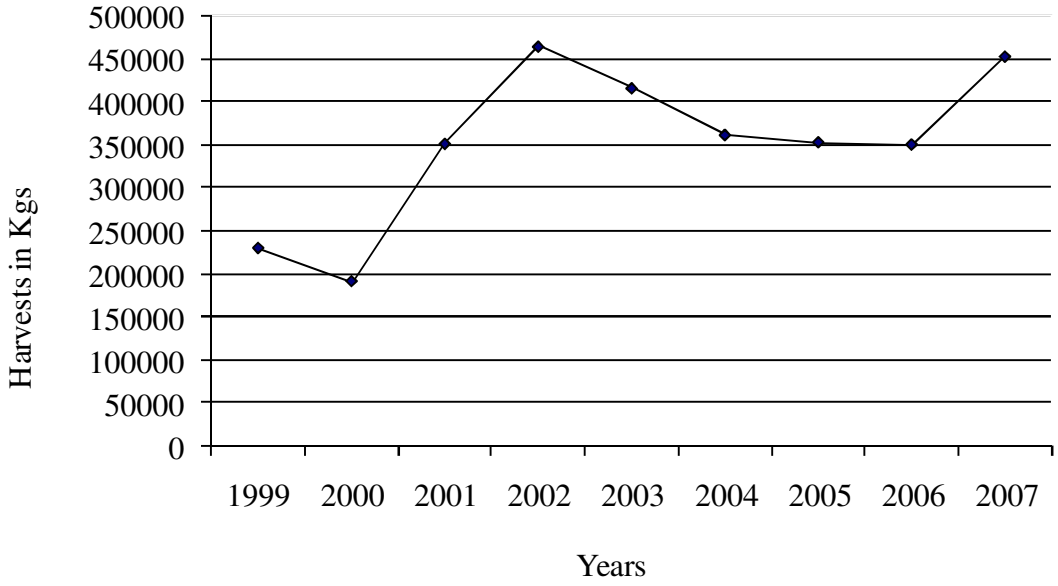

Figure 5. General trend of catch for the past nine years (1999-2007).

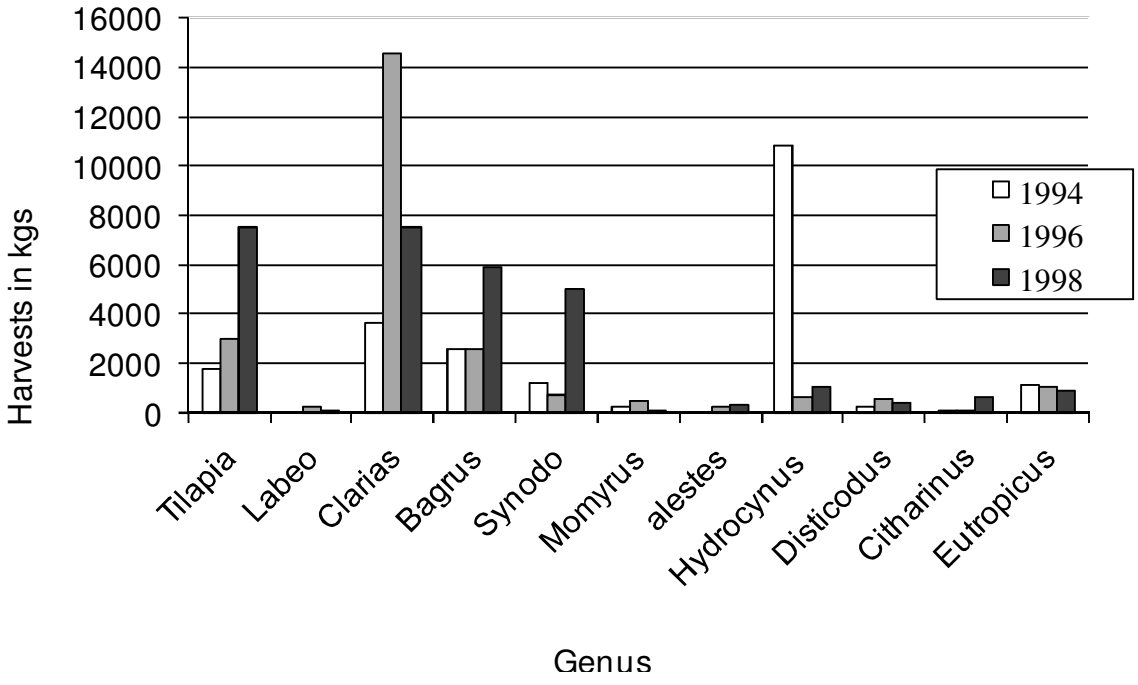

Figure 6. The catch per genus for 1994-1998 period.

identify.

Wetlands as source of grazing land and pasture

The wetland is also used as a grazing land for livestock. It is estimated that cattle stock constitutes about 300,000 cattle and that there are approximately 43,000 sheep and goats. The livestock population has been increasing during the past 10 to 15 years. This increasing population of livestock requires large land areas for grazing, which is not readily available in Kilombero Valley. This has resulted in a number of conflicts between livestock and crop farmers. Furthermore, in some parts of the flood plain the spongy character of the soils is changed due to livestock trampling. At these places soils are now more compacted.

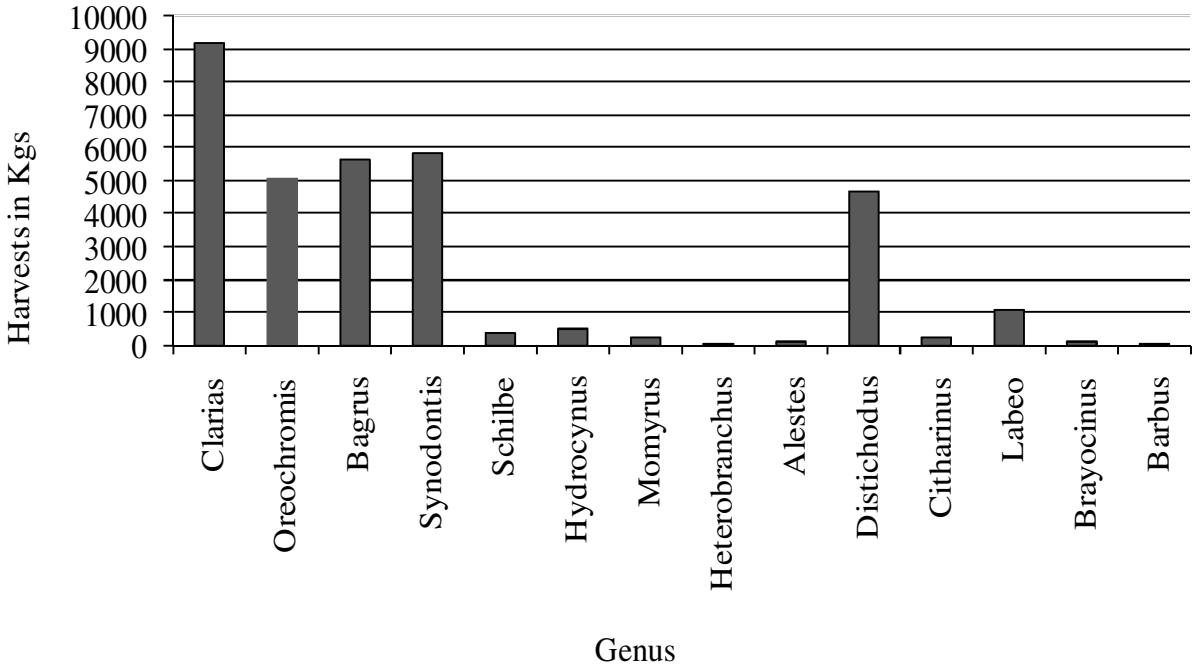

Figure 7. The catch by genus in 2008.

The livestock is also held responsible for the seasonally drying up of a number of water sources. Other negative effects of overstocking are overgrazing and water pollution with the chemicals used to treat the livestock against tick born diseases.

Community aspects

An important aspect drawing the relationship between the local communities and the wetlands is their income level. The majority of the households in the Kilombero wetlands are poor with an average consumption expenditure of 17,000 TAS annually which is significantly below the national average of 63,000 TAS (MNRT, 2004b). The majority of the households depend on agriculture as the main source of income, although the findings from this study show that there is a big percentage of households (30%) whose main income is derived from petty trading (Figures 7 and 8).

The figure clearly confirms that agriculture is a main source of livelihoods for the local communities. Following this it is evident that there is a big pressure on the wetlands and therefore a deliberate effort is needed to sustain the ongoing population of the area which is projected to be growing at the rate of 3.4 and 2% per annum for Kilombero and Ulanga Districts respectively. The population distribution is shown in Table 3.

Table 3 shows that Kilombero District is more densely populated compared to Ulanga District though care should be taken on how to interpret this distribution. It is equally true that a large part of Ulanga District falls in Selous Game Reserve, where people were relocated when the place was designated for the reserve and so most of the households are concentrated in some specific locations and not evenly distributed. This is the main problem with the population distribution in the valley as most of the area is taken from local communities and converged to either large scale farming or conservation reserves such as National Parks and game reserves. This pushes the rural poor to the marginal areas which in most cases are more vulnerable areas of wetlands.

In terms of production settings and technologies the region is underdeveloped. The local communities practice peasantry farming with hand hoe being the main tool of tillage. Although this is good for environment, it requires a lot of labor to put a large area into cultivation. Moreover, due to the poor technology the production is so low and limited to areas where there is enough moisture and where land is fertile (Table 3). Consequently since these areas are most of the time the important areas for ecosystem's health (De Leo and Levin, 1997; Robin et al., 2006) their use has a negative impact on the wetlands. More than that, the problem becomes so big when there are large companies which have good bargaining ability since these take good arable land and push the locals to very fragile and vulnerable areas.

Institutional arrangements and information sharing and their impacts on the management of the wetlands

The Kilombero Valley wetlands are recognized as Ramsar site and therefore are under the management of the

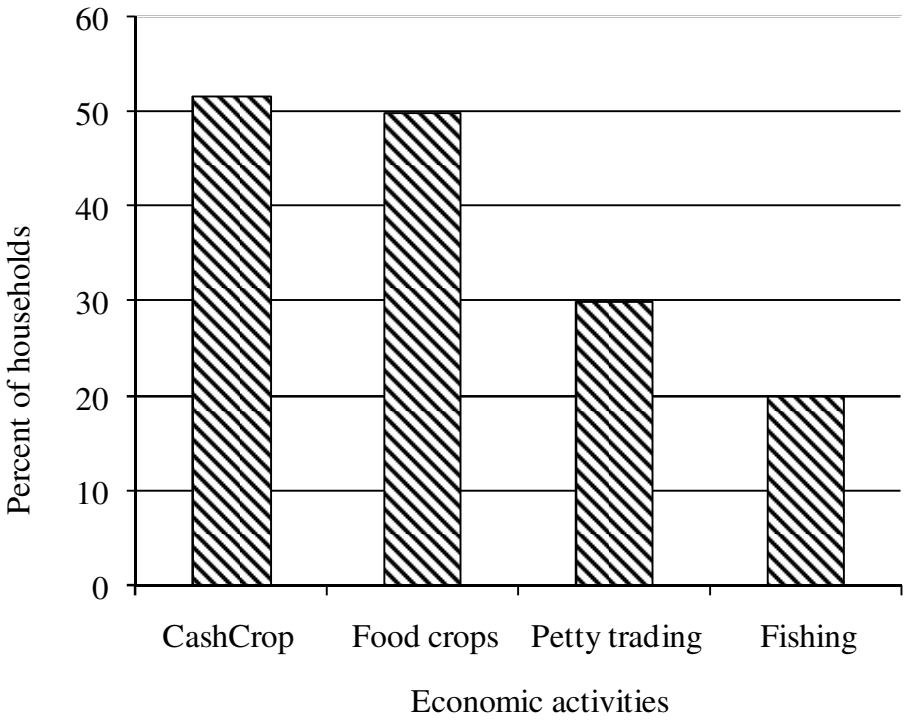

Figure 8. The distribution of household economic activities in Kilombero Valley wetlands.

Table 3. Population characteristics of Kilombero Valley wetlands communities (a map of population density would be better to use here).

District area	Total area (Km^2)	Land area (Km^2)	Population no			No. of households	Household size
			Men	Women	Total		
Kilombero	14,918	13,577	162,942	159,837	322,779	73,393	4.4
Ulanga	24,560	23,681	95,915	98,294	194,209	36,988	5.3
Total	39,478	37,258	258,857	258,131	516,888	110,381	4.8
Wetlands area	7,967	-	-	-			
Ulanga	-	-	56,519	58,668	115,187	20,953	
Kilombero	-	-	158,992	155956	314,948	-	
Total	7,967		215,511	214,624	430,135	-	

Source: MNRT (2004b) with minor modifications.

department of Wildlife Division in the Ministry of Natural Resources and Tourism. Under this division there is one unit which deals with wetlands in Wildlife protected areas (MNRT, 2009). According to an interview with key informants it was only recently that they started to have officials (Wetlands officers) in wetland protected areas which work on specific issues of wetlands. That the area is categorized as a Ramsar site implies that according to the Ramsar convention only wise use is allowed. The problem of the convention is that the term 'wise use' is not specific and therefore gives a loop hole of justification of uses especially for a poor country like Tanzania, which has to bargain between immediate developmental objectives and conservation perspectives which will be beneficial for future generations.

Furthermore since the division is only supposed to interfere with the issues of wildlife protection it does not have enough power to protect the area from other types of mismanagement related to for example agriculture, water, forest and energy issues whose activities are supposed to be carried out by other ministries through sectoral policies (MNRT, 2004a; MoA, 2007; URT, 2005). There are advantages and disadvantages attached to segmentation of natural resources management compared to an integrated approach (Vatn, 2009; Vanhyulenbroeck, 2009). Yet it is important to have a detailed study to elaborate on how advantageous or disadvantageous as far as sustainable wetlands management is concerned. Important to note is there is an integrating organ under the same wetlands unit in the

wildlife division. The problem arises when this organ is at the national level and therefore makes it difficult to solve problems which are in most cases important and/or detrimental at local level.

Not all wetlands in Tanzania (following the Ramsar definition of wetlands) are situated in Wildlife protected areas as is the case for Kilombero Valley. The Land Act and the Land Policy of 1999 even categorizes wetlands as hazardous areas and therefore these areas are not allowed by the law to be entitled to any individual or group of individuals for whatever use (URT, 1999).

Notwithstanding this legal statement many households live and earn their living in wetland areas. Thus there is a great contradiction to what is in the formal rules to the inform rules formed by the communities living in wetlands areas. Surprisingly even companies which are practicing large scale farming have legal occupancy to wetland areas. This however, raises the question as to whether what is defined to be wetlands by the Ramsar convention is the same as what is called wetlands in Tanzanian context let alone the local context. Following this, there is a need to thoroughly study this and come with appropriate suggestion as to what should be called wetlands and the reasons for that in Tanzanian's context so as to have a clear management area when it comes to sustainable wetland management.

Moreover, this problem of all wetlands not being protected by the Ramsar convention except those of international importance was once experienced by Canada when it first ratified the convention in 1981. Once the Ontario government realized that its 36 designated Ramsar sites represented only a small fraction of all wetlands in the country and that the clear majority of wetlands are not directly covered under the Convention, nor are they within the federal jurisdictional responsibility and since wetlands protection is a provincial and municipal governments responsibilities; the government decided to develop its own policy that would protect most of the wetlands which were by then fast degrading (Schulte-Hostedde et al., 2007). Tanzania does not have an independent policy on wetlands management however the new National wildlife policy has also incorporated wetlands management issues and by law they are mandated to protect all designated wetlands for protection (MNRT, 2009). In addition to this there is no legal instrument like a wetlands Act which would make the policy operational legally. From Canada's experience much could be learnt on sustainable management of wetlands in Tanzania.

Beside the above findings the survey in the area shows that most of local people (87%) do not know whether there is a specific law which prohibits them from performing specific activities in the wetlands areas beside that of cutting trees in the Udzungwa National Park. The people also do not know whether the area is designated as Ramsar site under the wildlife division which according to them owns Seleous Game Reserve. This shows how decision making is done by government elites living aside from the majority of the rural population of 87% unaware of ongoing conservation activities in the area despite many policies insisting on participatory approaches to natural resource management.

Moreover, the locals admit to be involved in conservation activities by Tanzania National Park Authority (TANAPA) and therefore have mentioned the institution as one of the forefront organs in conservation activities. This gives an encouragement that, if conservation programs are well structured like those of TANAPA by other institution present in the area with good coordinating unit then there would be a big impact in the sustainable management of the wetlands. However, all these conservation efforts by TANAPA are due to the fact that the community interactions with park resources were impacting the vital areas of attraction and therefore this was not an obligation of the park authorities to the environmental services provided by the whole wetland ecosystem. It is therefore important to have incentive mechanisms that would internalize the externalities created by the users of the wetlands. The internalization of externalities and synchronization of the rules governing the resource use in a Common Pool Resources (CPRs) such as wetlands would bring cooperation amongst the stakeholders involved in resources use and management (Turner et al., 2000; Gatzweiler and Hagedorn, 2001; Vanhuylenbroeck, 2002; Munishi et al., 2003; Ostrom, 2005; Hagedorn, 2008). As a result, the potentials of the stakeholders participation can be fully realized and utilized into bringing sustainable wetlands management.

CONCLUSION AND RECOMENDATIONS

The Kilombero Wetlands are an important source of livelihoods for the majority of dwellers in the area. However, currently these wetlands are threatened by ongoing use due to growing demands of the primary users which due to their poverty depend directly on the wetlands for their primary needs of energy, food, shelter and social well being. However, the present institutional setup amplifies the problem due to the fact that it encourages the ongoing lifestyle, which in the long run if not corrected would make the wetlands not able to sustain the needs of both primary and secondary users. Following this, it is perceived that the continuing management style is responsible for unsustainable management of the wetlands. It is now evident that although Kilombero is a Ramsar site there is still going on unsatisfactory use of products and services accrued from the wetlands a condition that threatens its sustainability. These findings suggest that ratification to the Ramsar convention may not necessarily be sufficient condition to sustainable wetlands management. Because of this, it is important to have appropriate incentive mechanisms that would be institutionalized to make both primary and secondary

users of the wetlands obliged to internalize the externalities they create to their counterparts (other primary and secondary users) in order to have sustainable management of the wetlands. It is therefore recommended to:

(1) Evaluate the externalities (costs and benefits) created and find out the extent to which they are responsible for the resources miss-management.
(2) Examine how the created externalities can be internalized so as to have social optimal resources use in the wetlands which together with institutions rearrangement would ultimately lead to sustainable wetlands management.
(3) Evaluate the rules governing the use of the resources and their relationship to unsustainable wetlands management.

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