

Sub - Theme 4: Maintaining ecosystem integrity – key in achieving IWRM

CHALLENGES AND OPPORTUNITIES FOR SUSTAINING THE USANGU WETLAND IN TANZANIA

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ABSTRACT

Despite the many benefits that wetlands provide, the same resources constitute one of the most threatened, degraded and lost habitats in the world. Sustaining them and restoring the lost ones require a thorough understanding of the roots of the problem and the means to overcome it. Based on this ground, a study was conducted in Usangu Plains in the southwestern part of Tanzania using various Participatory Rural Approaches (PRAs) and a semi structured questionnaire so as to explore the challenges and opportunities for achieving sustainable management of the Usangu wetland. The following major challenges were identified: a) the challenge of ensuring a year round environmental water flow to the Usangu wetlands, b) the challenge of resolving the “paradigm dichotomy” between the natural resource conservationists and local communities (i.e. the conservation dilemma of whether to adapt a complete preservation approach or a flexible conservation approach to wetland resources, by allowing multiple uses of wetland resources), c) the challenge of winning the support of the local communities or actively involving them in ensuring sustainable management of wetlands, and d) the challenge of ensuring a thorough understanding of the trade-offs between utilization and sustainability of wetland resources, given the current rate of degradation and losses. Community-based conservation was perceived as the most preferable wetland conservation approach, which seeks to co-opt the managerial capacities of the wetland resources to the local people themselves, who have been very often by-passed in the conventional approaches.

Key words: Usangu wetlands, Wetland loss, Wetland utilisation, Wetland restoration, Community-based conservation

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INTRODUCTION

Globally, wetlands cover about 7 - 9 million square kilometres, or about 5 - 6 percent of the land (Mitsch, 2004) and are a central component of the hydrological cycle, performing economically and environmentally valuable functions. Humans have used wetlands for fishing, grazing of livestock, agriculture, salt collecting and reed harvesting. Wetlands also constitute a very important habitat for wildlife and are second only to tropical rainforests as reservoirs of biodiversity and natural productivity (Pearce and Crivelli, 1994). They support over 60 water bird species from 15 families (Hollis *et al.*, 1993) and are considered to be of international importance as habitats for waterfowl populations. They provide a permanent habitat for many organisms, including some 8,500 species of fish, and a breeding ground or temporary home for others, such as most of the world's 4,200 species of amphibians and reptiles (Salathé, 2000). In addition, wetlands also improve the quality of water by accumulating sediment, nutrients and toxic substances, alleviate flood effects, stabilise the coastal zone with their vegetation and reduce carbon dioxide emissions by acting as a carbon sink (Maltby, 1991). They also represent a valuable cultural heritage and more recently they have become important for recreation purposes and tourism, such as swimming, sailing, bird watching and nature photography.

Despite their many benefits, wetlands constitute one of the most threatened habitats in the world. The available information shows that about half (50%) of the original wetland resource in the world has been lost and many of the remaining wetlands are also seriously degraded (Mitsch, 2004). Reverting this trend is crucial and it requires that the roots of the problem and the means to overcome it are well understood.

In Usangu plains, the establishment of irrigation schemes like the large-scale Mbarali and Kapunga Irrigation Schemes and smallholder schemes (e.g. the Majengo, Ipatagwa, Kimani and Motombaya

irrigation schemes) is considered as one of the major causes of wetland degradation and losses. These schemes have attracted more immigrants from highland regions and pastoralists from northern and central Tanzania (Kadigi *et al.*, 2004; Kadigi and Mdoe, 2004; SMUWC, 2001; Maganga and Juma, 2000; Mbonile *et al.*, 1997; DANIDA/World Bank, 1995), resulting not only into a concomitant expansion of land under irrigated agriculture but also growing conflicts between agriculture and wetland conservation. So much water is abstracted by these schemes denying access to adequate water to the fragile ecosystems downstream [including the Usangu wetland and Ruaha National Park (RNP)].

Before irrigated agriculture started to take so much of water from the rivers in Usangu plains, both the western and eastern halves of the Usangu wetland used to flood every wet season (DANIDA/World Bank, 1995). Now only the eastern half is flooding regularly. The Mkoji River, which is one of the tributaries of the Great Ruaha River (GRR), is now typically drying up in the dry season, as it is often the case for the GRR in the western wetland (Kadigi and Mdoe, 2004; SMUWC 2001). In the past, water used to be pouring off the highlands into the western wetland during the wet season. The GRR, the only exit from the wetland, could not contain all the water. So water was spilling over into the western wetland and in so doing flooding large areas and maintaining the Usangu wetland. The GRR slowly moved water from the western wetland to the eastern wetland. Because of the rock bar at N'Giriama, water could not leave the eastern wetland before the level of water in the *Ihefu* swamp is higher than the rock bar. Large areas of land behind the rock bar became flooded – creating the eastern wetland.

The Usangu wetland is shrinking in size. The dry season vegetative cover of the *Ihefu* swamp in the Eastern wetland, for example, is reported to have decreased by 67% from 1984 to 2000 (Kashaigili *et al.*, 2005). The western wetland is no longer flooding regularly and qualifying as a wetland. This translates to one central question: the question of what should be done to revert this trend and

safeguard the Usangu wetland. This calls for a thorough assessment of the impact of past and current wetland management and utilization – an assessment, which will precisely inform policies and decision makers of the constraints and opportunities for sustaining the Usangu wetland. This paper presents and discusses the challenges and opportunities that exist for restoring and sustaining the existing wetland resources in Usangu Plains.

METHODOLOGY

The study area

The Usangu Plains are located in the southwestern part of Tanzania between longitude 33° - 35°E and latitudes 8° - 9°30'S (Figure 1). Located within the Usangu plains is the Usangu wetland - which lies at the heart of the plains covering an area of about 1,800 km². The wetland is divided into two parts – the western and eastern wetlands – joined by a narrow band of land along the river at Nyaluhanga (Figure 2). The *Ihefu* swamp is part of the eastern wetland (most of which is now within the recently gazetted Usangu Game Reserve).

The Usangu Plains are flat and surrounded by the Poroto and Kipengere mountains in the Southern Highlands between Mbeya and Iringa, and Chunya mountains. They lie at an average elevation of 1100 m above mean sea level while the surrounding hills are at an average elevation of 3000 m.

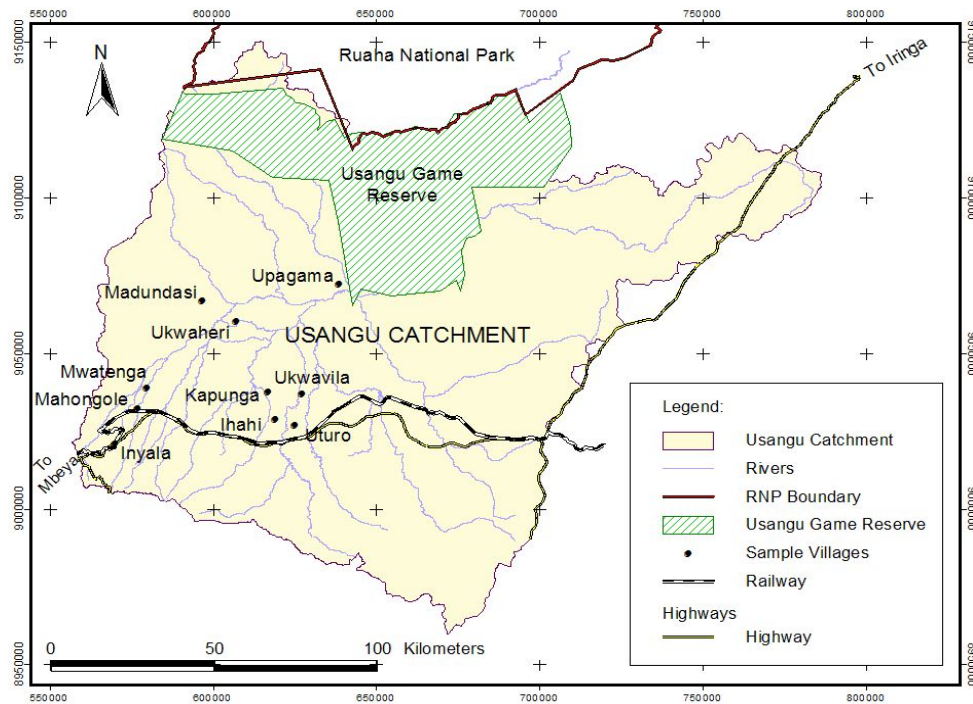


Figure 1: Map of Usangu.

The major, perennial rivers draining the Usangu plains are the Great Ruaha, Mbarali, Kimani, Chimala and Ndembera. The first four rivers account for 70% of measured average annual flow, while the Ndembera accounts for an additional 15% (SMUWC, 2001). The small rivers include Umrobo, Mkoji, Lunwa, Mlomboji, Ipatagwa, Mambi, Kioga, Mjenje, Kimbi, Itambo and Mswiswi rivers. Most of these rivers especially in the southwest of Usangu plains are not perennial and hence insignificantly contributing to the inflows to Usangu wetlands, particularly in the dry season. The major water supplier to the Usangu wetlands is the GRR, which flows through the Ruaha National Park (RNP). Just downstream the RNP, the GRR joins another river (the Little Ruaha) to supply water to the Mtera hydropower plant. The GRR provides 56% of runoff to Mtera. The Little Ruaha River provides an additional 18% and the Kisigo River 26% of the total runoff to Mtera (SMUWC, 2001).

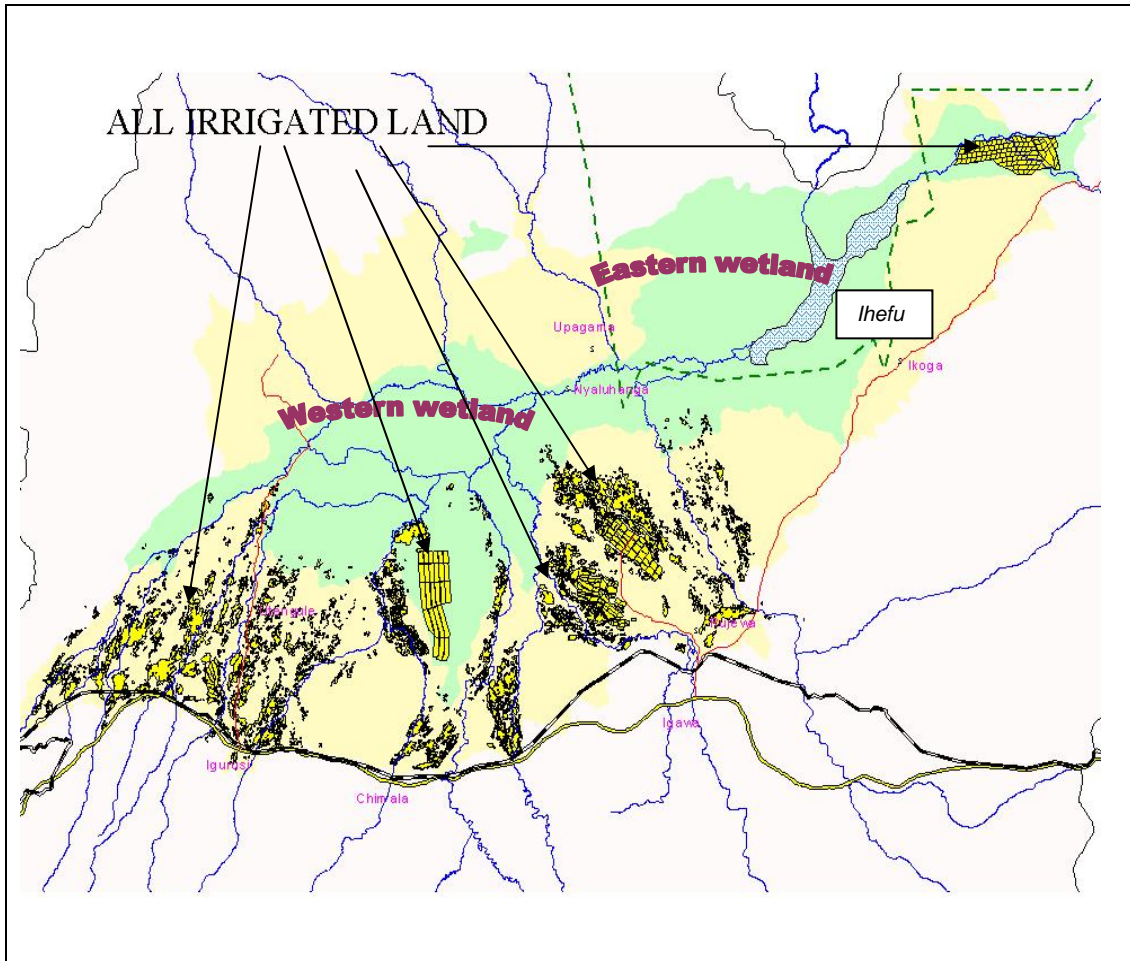


Figure 2: Part of the Usangu Plains showing the Western and Eastern wetlands and the area under irrigated agriculture (Modified from SMUWC, 2001).

Data collection and analysis

A questionnaire was prepared and administered to sixty-two households randomly selected from three sample villages in Usangu (Uturo, Kapunga and Upagama). In addition, informal discussions were conducted with several other stakeholders - including officials of the Usangu Game Reserve, and the management of Kapunga and Mbarali NAFCO farms.

At the household level, the questionnaire covered, among others, the questions of socio-economic characteristics of the sample households (including gender, age and education level of the head of

household, origin of the head of household and reasons for migration if not native, household size, main sources of income etc.); household perceptions of the threats or causes of degradation of the Usangu wetland (including a historical-narrative of the wetland status, economic activities undertaken within and around the wetlands, species of flora and fauna that have disappeared or threatened), personal comments concerning the decision of the government to gazette part of the Usangu wetland as a Game Reserve; opportunities for sustaining/restoring the Usangu wetland; and suggestions of the type of wetland conservation model that would be preferred.

As for the household survey, the informal discussions with village leaders, officials of the Usangu Game Reserve, and the management of the Kapunga and Mbarali NAFCO farms also sought to elicit a set of information that would help identifying the 'driving forces' for wetland degradation and losses, possible losses of biodiversity and opportunities available for restoring and sustaining the Usangu wetland. In addition, this also helped gathering secondary information (official statistics) related to the subject under study.

Both qualitative and quantitative techniques were used to analyse the data. For more precise analysis, computer-based statistical programs [Statistical Package for Social Sciences (SPSS) and Excel] were used.

RESULTS AND DISCUSSION

Human immigrations to Usangu

Percentages of immigrants and areas of origin

About 64% of the total households in the sample villages reported as immigrants from other areas (outside the Usangu plains) (Figure 3). The majority are the Sukuma agropastoralists originating

mainly from Shinyanga, Mwanza (and possibly Tabora) regions (39%), and migrants from other areas in Iringa and Mbeya regions (23% and 20% respectively) (Figure 4).

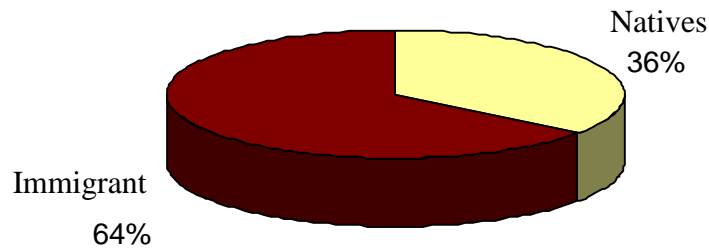


Figure 3: Proportions of immigrants versus natives

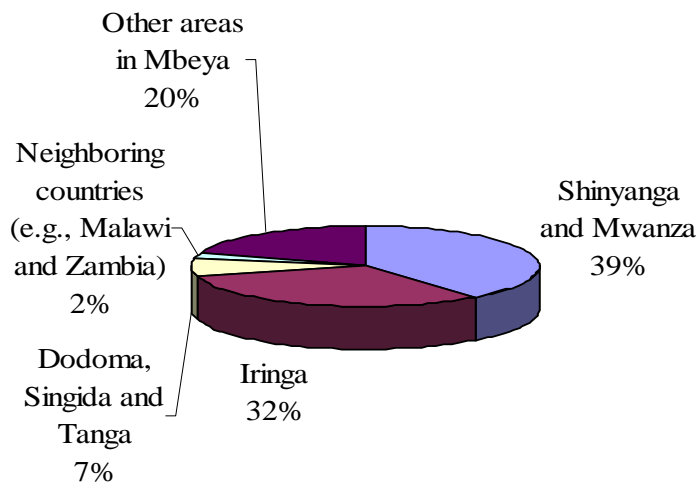


Figure 4: Areas of origin and percentages of households for the Usangu immigrants.

Years of migration

More than half of the immigrant households reported to have migrated to the sample village before 1988. High immigration fluxes were reported to have occurred between 1968 and 1970, in 1984, early and late 1990s and in 2000 (Figure 5).

When asked to rank the drivers of their migration to Usangu plains, most of the immigrant respondents (93%) pointed out the search for farmland and suitable grazing land for livestock as the major drivers (Table 1). Other factors (e.g. migration through marriage, search for new jobs/employment or official transfers from other working stations) were given less weight, representing only about 7% of the total drivers.

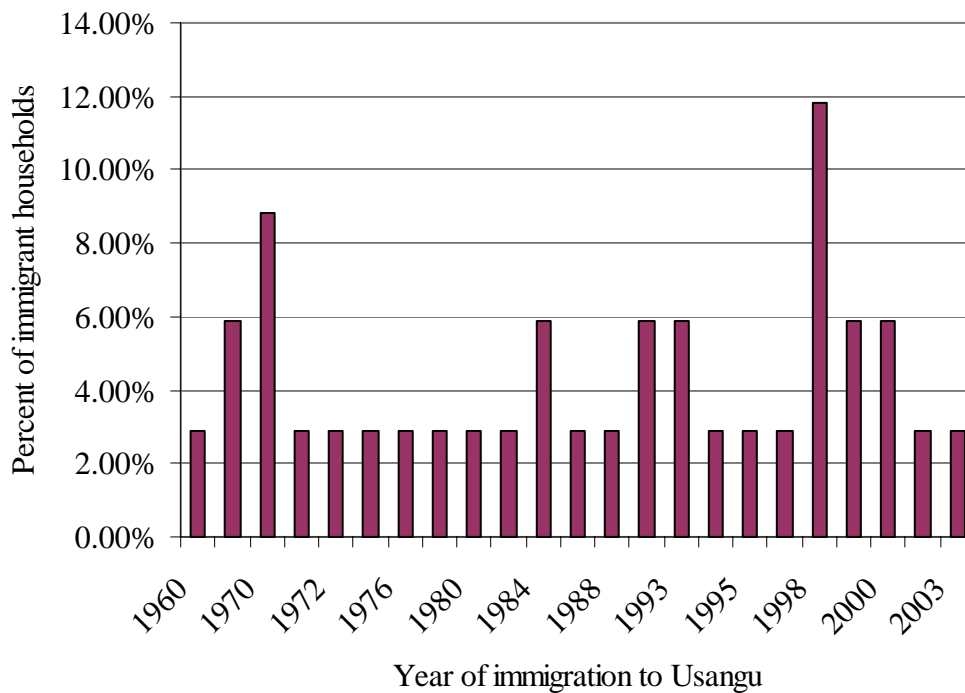


Figure 5: Trend of household immigration to Usangu

Table 1: Major reasons for migration influxes to Usangu

Reason	Frequency	Percent	Cumulative Percent
Search for farmland	30	75	75
Search for livestock grazing land	7	18	93
Migration through marriage	2	5	98
Search for new jobs or transfers	1	3	100
Total	40	100	

Source: Own survey, (2004).

Status of existing wetland resources in Usangu

Almost all of the respondents (97%) reported that the condition of the Usangu wetlands has deteriorated considerably for the past ten years. According to the respondents, the major reasons for deterioration/degradation are increasing human population and exploitation of wetland resources; conversion into agricultural land and increasing irrigation activities upstream; increasing livestock population, and lack of proper wetland management policies and strategies. Other causes are as summarized in Table 2.

These findings presented in Table 2 are in line with the arguments put forward by Kashaigili *et al.*, (2005) who argue that “the Usangu wetlands have changed appreciably in size over the recent years and the water inflows to the wetlands have decreased with time as a result of increased human interventions.” In their study, Kashaigili *et al.*, (2005) have integrated hydrologic data, remote sensing and Geographical Information System (GIS) techniques to assess the dynamics and spatial responses of the Usangu wetlands. They develop a monthly water balance model for the wetlands to determine the major components of the water budget and they show that the dry season vegetated cover of the *Ihefu* swamp has decreased by 67% over the 16 years from 1984 to 2000.

Table 2: Weighted percentages of the causes of wetland degradation in Usangu

Reason	Uturo	Kapunga	Upagama	Pooled sample
a) Increasing human population and exploitation of the wetland	28	21	34	28
b) Conversion to agricultural land and increasing irrigation activities upstream	25	12	35	24
c) Increasing livestock population and exploitation	12	23	12	16
d) Lack of proper management policies and strategies	11	21	8	13
d) Change in river flow regimes	15	12	5	11
e) Change in climatic conditions	9	11	6	9
Total	100	100	100	100

Source: Survey data, 2004.

Perceptions on wetland conservation

The respondents were also asked to comment on whether the government's decision to gazette the *Ihefu* swamp (part of the Eastern wetland) under the name of Usangu Game Reserve has in anyway affected their families. About 92% of the interviewed households reported as being negatively affected and none of them reported as positively affected (Table 3).

Table 3: Household perceptions on the effects of gazettement of the Usangu Game Reserve

Response	Number of sample households	Percentage
No effect	5	8
Negatively affected	57	92
Positively affected	0	0
Total	62	100

Source: Survey data, 2004.

As most of the respondents have argued, the gazettement of the Usangu Game Reserve has resulted into a denial of the right of local communities to have free access to wetland resources – a right they have inherited from their ancestors as “a gift from God”. The contribution of the Usangu wetland to the economy/livelihood of the rural households living around it has been enormous. The rural communities in Usangu have benefited from a range of economic activities - from grazing around the Ihefu swamp (28%), fishing (23%), harvesting grasses (15%) and farming (14%) to harvesting of reeds (including *ukindu*) (12%) (Figure 6) just to mention a few.

Worth noting is the observation that, the contribution of the Usangu wetland to the livelihoods of the rural households differs from one village to another. In Uturo village (which is located upstream of the Eastern wetland), for example, grazing has ranked as the highest wetland-based economic activity (28%), followed by farming (25%), whereas in Upagama (which is located far downstream very close to the *Ihefu* swamp), grazing (35%) also forms the most important economic, but fishing (34%) has also ranked as one of the major economic use of the wetland – the second in the list and even more important than farming.

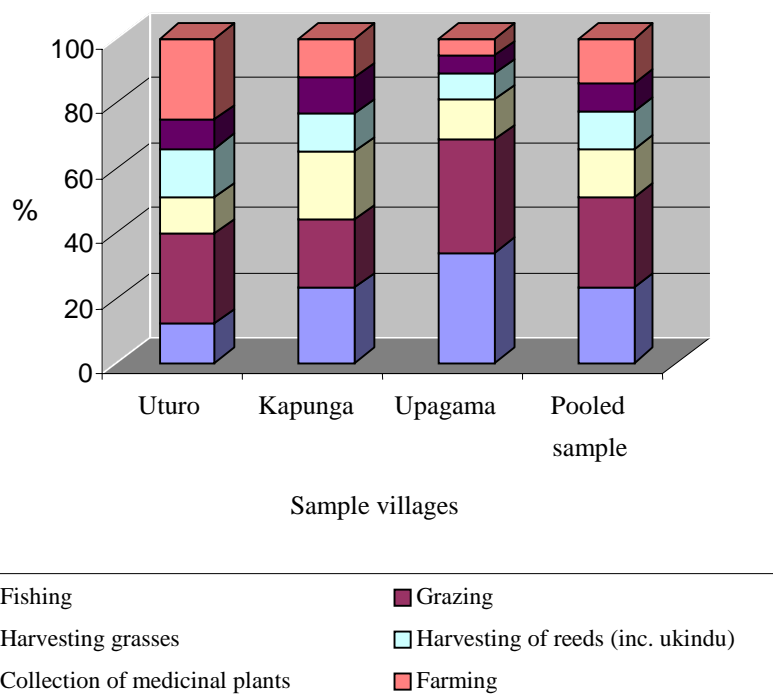


Figure 6: Weighted percentages of the key economic wetland benefits accrued before the gazettement of the UGR.

Recognizing the benefits that local communities in Usangu have been accruing from wetland resources, most of the interviewed households (about 85%) have shown the concern of conserving and sustaining the remaining wetland and where possible restoring the lost ones (Table 4).

Table 4: Local views on the need to conserve, restore and sustain the Usangu wetland

Response	Percent of respondents
Yes, need to conserve the remaining wetlands	85
No need to worry about them, there are there to be utilized	12
Undecided/not certain	3
Total	100

Source: Survey data, 2004.

The challenges

The following major challenges were identified:

- The challenge of ensuring a year round environmental water flow to the Usangu wetlands. The current research work by Kashaigili *et al.*, (2005), estimates an inflow of about 6.8 m³/s into the Eastern wetland in the dry season so as to maintain an outflow of about 0.5 m³/s from the wetland downstream to the Ruaha National Park. According to Kashaigili *et al.*, (2005) this implies that the available dry season water resources be reallocated in such a way that about 20% of the available water resource is used for anthropogenic needs and the remainder 80% is allowed to flow downstream for environment needs. Put differently, this translates to the challenge of saving water from the irrigation schemes upstream and releasing it downstream for the environment and other users.
- The challenge of resolving the existing “paradigm dichotomy” between the natural resource conservationists and local communities in Usangu. The former group advocates for a total protection of the Usangu wetlands (i.e. banning all exploitative/consumptive human uses in the Usangu wetland – c.f. the gazettelement of the Usangu Game Reserve), while the local communities do not see any compelling reasons for that. The latter stakeholders (local communities) prefer leaving aside a part of the wetland for other economic uses (notably livestock grazing, fishing and other land uses).
- The challenge of winning the support of local communities in ensuring sustainable management of wetlands, and
- The challenge of having a thorough understanding of the trade-offs between utilization and sustainability of wetland resources, given their current rates of degradation and losses.

Opportunities for improvements

The respondents in this study were also asked to suggest and rank the options that would help sustaining the Usangu wetland, restore the lost western wetland and rank the wetland conservation approach they would prefer so that each of the respondents gave a rank for each approach. The individual scores were then added and divided by the number of respondents for each sample village. In so doing, the overall weighted percentages of average score for each conservation approach were obtained (Table 5).

As it can be seen from Table 5, community-based conservation (e.g. through the establishment of Wildlife Management Areas – WMAs) ranked as the most preferable wetland conservation approach and conservation through use of private companies as the least preferable approach. The former approach is seen as promising enough to ensure sustainable utilization of the wetland resources in the study area. The approach seeks to co-opt the managerial capacities of wetlands to the local people, who have been very often by-passed in the conventional approaches of natural resources management. In other words, the approach is a reflection of new recognition of natural resources management insight of local people's cultures and the determinative power of the local communities to shape their future. In addition, the approach is seen as potential enough to warrant sustainable utilization through quota harvesting of wetland resources, for example, as opposed to the current arrangement where only a few, registered hunting companies are benefiting (e.g. the Usangu Hunting Safari and others).

Table 5: Weighted percentages for the type of wetland conservation approach preferred

Type	Uturo	Kapunga	Upagama	Pooled sample
• Conserve under local community management – and allow sustainable utilization of the resources (e.g. through establishment of Wildlife Management Areas – WMAs)	56	43	61	53
• Conserve under MNRT management – but allow using the wetland resources sustainably	19	34	18	24
• Total conservation (no utilization at all) – managed by the local communities (villagers and their leaders)	16	14	14	15
• Total conservation (no utilization at all) – managed by Ministry of Natural Resources and Tourism (MNRT) through Game Department	9	8	5	7
• Conserve through private companies	0	1	2	1
Total	100	100	100	100

Source: Survey data, 2004.

It was also revealed in the study that, most of the households in the study villages were not consulted during the process of gazetting the Usangu Game Reserve - although interviews with some livestock keepers in Upagama village have revealed that, some consultations were made somewhere else (e.g. in Idunda village), where very few livestock keepers reside and could therefore, not adequately represent and safeguard the interests of livestock keepers' access to grazing areas in the wetland.

Most respondents suggested a reconsideration of the gazettement of the Usangu Game Reserve – reconsideration of setting aside some part of the reserve for other land uses (mainly livestock grazing, crop cultivation and licensed fishing in the *Ihefu* swamp). Some suggested the new border for the game reserve to be moved back so that it passes through the Kidumka, Lasti, Msua to Maweshi areas.

CONCLUSION

Both the views of local communities and conservationists in Usangu concur with regard to the argument that the Usangu wetland resources are deteriorating mainly due to increasing human pressure. The western wetland, for example, has been almost lost because of increasing human activities, providing both increased direct and indirect threats not only to the biological diversity and general ecological functioning of the wetland but also to the sustainance of the livelihoods of the local communities in Usangu.

The direct threats to wetland resources in Usangu involve direct interference, such as land use conversion. Indirectly, most critical is that reductions in flow due to development in irrigated agriculture appear to have greater impact in both the western wetland and eastern wetland. Over time, this is likely to result in reduced seasonal flooding, changes in vegetation (e.g. loss of grassland and increased woody encroachment), and associated changes in the macro- and micro-fauna.

Generally, local communities in Usangu support the need to conserve the Usangu wetland but they strongly criticize the conservation approach that has been used by the “Government” in gazetting the Usangu Game Reserve. Although considered as “participatory” by the government most of the local people in Usangu still perceive it as more of a “top-down” approach.

The paradigm dichotomy existing between the environmental groups and local communities in Usangu is a symbolic call for an alternative approach to wetland management in Usangu (i.e. active involvement of the local community in the decision making process, particularly when plans, decisions and strategies of managing these natural resources are drawn). Sustainable management of wetlands cannot be achieved without active participation of all stakeholders. Experience has shown that, wetlands conservation policies that had relied only on complete protection have shown their limits. Solutions to ensure protection of these fragile environments while maintaining the livelihood benefits to local people are needed (i.e. the threats to wetland loss needs to be reconsidered in light of the management and conservation strategies and actions which may be implemented voluntarily by the local communities themselves, to ensure the continued survival of wetlands).

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