



How characteristics of wetlands resource users and associated institutions influence the sustainable management of wetlands in Tanzania



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ABSTRACT

Natural resources management has been an issue of global concern due to the ongoing deterioration in the stock of natural resources worldwide. This problem has often been linked to the rules governing the management of these resources. The current study was conducted in Kilombero wetlands, a Ramsar site in Tanzania, to determine whether variations in knowledge of the rules and regulations governing management of wetlands amongst the resource users can explain the current degradation of the wetlands. The results show the existence of such variations. Awareness of environmental problems and participation in conservation projects were found to have a positive influence on the knowledge of rules and regulations. The study therefore, recommends an immediate and meaningful harmonization of the framework of various institutions, which together with environmental education would result in a common understanding of the constitutional rules amongst the primary and secondary wetland resource users. Such an arrangement would lead to participatory and sustainable wetland management.

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Introduction

Natural resources management has been an issue of growing global discussion for the past three decades. The ongoing deterioration in the stock of these resources all over the world seems to suggest that the current management and use of natural resources is unsustainable (De Leo and Levin, 1997; Healy, 2006). In many parts of the world, forest stocks have been declining, fishery harvests have been decreasing significantly and flooding due to wetland degradation has now become a common phenomenon (Mayer, 2002; Carlsson et al., 2003; Schulte-Hostedde et al., 2007; Birol et al., 2009). The causes of mismanagement and use of natural resources are many, and have been amply documented (Kangalawe and Liwenga, 2005). One such cause, suggested by scholars such as North (1990), Williamson (1995), Ostrom (2005) or Hagedorn (2007), may lie in the existing rules and regulations which are used in accessing and/or managing these resources.

Tanzania is endowed with natural resources such as forests, minerals, natural gas, wild animals and wetlands. Wetlands cover about 10% of the land surface in Tanzania and range from lakes,

rivers, and floodplains, to deltaic mangrove formations. Wetlands are potentially suitable for economic activities such as agriculture, fishing and tourism and if well managed they have the potential to contribute highly to the country's economy. Moreover, already now the contribution of wetlands in terms of direct income is significant for rural communities, as most of these communities depend entirely on crop and livestock production (United Republic of Tanzania, 2007). Because Tanzania's agriculture is highly dependent on rain, and the use of farm inputs is low, agricultural activities are often carried out in wetland areas so as to exploit the natural soil fertility and soil moisture that prevails throughout the year (United Republic of Tanzania, 1997a).

The degree, methods and extent of wetlands use in Tanzania varies across environmental and socio-economic conditions. This variation in the pattern of use of wetland resources from one area to another has a substantial impact on the state of wetlands in these places. In some areas, the impact is very profound while in others it is minimal; and additionally, some wetlands are still in fairly pristine conditions. Some of the most degraded wetlands in Tanzania are located in the Pangani River basin, the Kilombero valley and the Usungu plains in the Upper Great Ruaha River, where ecological alterations have been palpable (United Republic of Tanzania, 2007). According to Schuijt (2002) such alterations are often linked to the exploitation of the life support services and resources provided by wetlands.

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According to Hagedorn (2007) natural and social systems do interact perpetually and sometimes have to collide. Due to advances in new technologies, increasing population and economic growth, human impact on ecosystems poses a serious threat to the sustainability of the natural resource base. Moreover as Hagedorn (2007) and Quinn et al. (2006) suggest, where degradation prevails, attention should be drawn to the set of rules governing the interactions. It is from this perspective that the characteristics of actors linked to having a common understanding of the institutions responsible for the management of natural resources become an important research topic. This is for example apparent from the IoS framework of Hagedorn (2007). Furthermore as Hagedorn (2008) argues that in most cases, nature related transactions, which are a central point of analysis in institutions governing the uses of natural resources in the ecosystems, are an under-researched topic. This justifies the current study, which is adding knowledge on nature related transactions in the wetlands of Tanzania.

The study uses Kilombero valley wetlands in Tanzania as a case. In the analysis, a particular focus was on how knowledge varies amongst the stakeholders: the primary and secondary users, and managers of wetland resources. The two groups are located in two different places, each accruing wetland products and services from the same wetlands in different ways and forms. The understanding of these variations could contribute to sustaining the consistency and effectiveness of the rules and regulations (institutions) existing in various government sectors. Many rules and regulations, although not primarily enacted to protect wetlands, are linked to sustainable wetland management. The findings of our study would therefore help to devise the mechanisms through which the two groups of stakeholders can be brought into collective responsibility and action.

Theoretical framework

This study is grounded in the theories of New Institutional Economics and uses the Institutions of Sustainability (IoS) framework conceived by Hagedorn (2007). In the IoS framework, features of transactions² and characteristics of actors are considered as determinants of institutional³ innovation leading to property rights on ecosystems functions and governance structures for natural resources. In the same light, Thiel (2006) argues that the characteristics of different types of actors are deeply intertwined with the transactions and underlying activities which the actors are involved in. Other scholars of institution theories e.g. Ostrom (1998) and Agrawal (2001) argue that actors' method of action⁴ selection is based on their ability to learn from mistakes. At this point there are two important factors that need to be looked at: social connectedness and culture. In other words, the social connectedness of an actor regulates behavioural norms, preferences and distribution of resources. The culture on the other hand, gives a common set of values and rules which govern an interaction between nature and actors. In common pool resources (CPRs)⁵ such as wetlands, the users have various socio-economic backgrounds which defines

their culture, characterised by various norms, which is a reality established in Agrawal's (2001) research. If there are no mechanisms, or rather institutional frameworks, to harmonise such varied actors' interactions with nature, then there is a significant likelihood of degradation of ecosystems.

Common understanding amongst the diverse groups of stakeholders is considered to be important in designing institutions that would result in responsibility for collective action (Heikkila and Gerlak, 2005). Responsibility for collective action is important because the CPRs users, as described earlier, are normally many, varied and spaced in such a way that they do not know each other and that even if they did know each other, their transactions through the physical nature (ecosystem) might be influencing their counterparts (Agrawal, 2001; Schlager and Ostrom, 1992; Blomquist and Schlager, 2004; Ferraro, 2001; Adams et al., 2004).

This study focuses on how the variations in the characteristics of the actors in wetlands influence the knowledge of the rules and regulations governing wetland resource management and use. This is because according to Agrawal (2001), Heikkila and Gerlak (2005) and Thiel (2006), such variations are inevitable since the nature of CPRs allows that to happen. The authors suggest that when such multi-institutions (formal rules and regulations) exist, the only way of harmonizing them is through designing mechanisms that coordinate the users and managers.

Methods

The study area

The Kilombero wetlands area is situated in the Southern part of Tanzania. The wetlands are located between the Udzungwa Mountains and the Mahenge escarpment, which is part of the Eastern Arc Mountains. The valley is divided by the Kilombero River and falls within two districts, Kilombero and Ulanga in Morogoro region. The wetland area covers 7967 km² with a catchment area of about 40,000 km². Many rivers, permanent and seasonal, feed the floodplains. The area is characterised by a sub-humid tropical climate with a relative humidity ranging between 70 and 80% and an annual rainfall of about 1200–1400 mm. It has two rainy seasons: long rains from March to May and short rains from October to December. Temperatures normally vary between 20 °C and 30 °C (United Republic of Tanzania, 2007).

The Kilombero valley wetlands are recognised as a Ramsar site and therefore they are under the management of the Wildlife Division of the Ministry of Natural Resources and Tourism. Under this division, there is one unit which deals with wetlands in the wildlife protected areas. It should however be noted that not all wetlands in Tanzania (according to the Ramsar definition of wetlands) are situated in Wildlife protected areas. Moreover there is no specific policy on wetlands management; although the new National Wildlife Policy has also incorporated wetland management issues (United Republic of Tanzania, 2007). In addition to this, so far there is no unified legal instrument like a Wetland Management Act which would act as a legal framework in overseeing wetland resources in Tanzania.

In practice, there are various laws and policies all contributing to the management of wetlands, namely, the Wildlife Policy (United Republic of Tanzania, 2009); the National Environmental Policy (United Republic of Tanzania, 2005); the National Water Policy (United Republic of Tanzania, 2002a); the National Lands Policy (1995); the National Land Act (United Republic of Tanzania, 1999); the National Forest Policy (United Republic of Tanzania, 1998); the Forest Act (United Republic of Tanzania, 2002b); the National Fisheries Sector Policy and Strategy Statement (United Republic of Tanzania, 1997b) and others. The implementation of these laws

² Transactions are hereby defined as those actions producing environmental problems through production or consumption (Hagedorn et al., 2002).

³ Institutions refers to set of rules which are equivalent to constraints that can and actually do imposed on human being interactions with nature and this is what is called "Institutions of Sustainability" (Hagedorn, 2007).

⁴ A point where two holons—participants and an action situation interact as they are affected by exogenous variables and produce outcomes that in turn affect the participant and the action situation (Ostrom, 1996).

⁵ A common pool resource is defined as a valued natural or man-made resource, from which it is difficult to exclude or limit users once the resource is provided (exclusion problem) and one person's consumption of resource units make those units unavailable to others (subtractability problem) (Ostrom and Schlager, 1996).

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