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CONSERVATION RELATED ATTITUDES OF WETLAND USERS IN KISII DISTRICT, KENYA

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ABSTRACT

Wetlands are critical natural resources in Kenya where they perform a range of environmental functions and provide numerous socio-economic benefits to local communities. However, many wetlands throughout Kenya have come under extreme pressure as government policies, socio-economic change and population pressure have stimulated a need for more agriculturally productive land. It is estimated that in Kenya only about 10% of the original wetland areas now remain. As in other places, institutional arrangements for the management of these fragile ecosystems have been inadequate. However, recent enactment of National Environmental Management Act (NEMA) in the country offers some promise for improvements. This paper reports on a questionnaire survey administered to a sample of wetland users in Kisii District on the subject of wetland protection and management. The implication of the results of this survey in the context of a strategy for wetland management in the district is discussed.
Key words: Wetlands, Environmental attitudes, Wetland Management, Kenya.

Introduction

Wetlands are transitional zones between land and water, a collective term for marshes, swamps, bogs and similar areas. They have been described as the "kidneys" of the landscape as they filter sediments and nutrients from surface water. Wetlands are often referred to as "biological supermarkets" because they support all life forms through extensive food webs and biodiversity (Mitsch and Gosselink, 1986). They help regulate water levels within watersheds, improve water quality, reduce flood and storm damages, provide habitat for important fish and wildlife, support hunting, fishing, other recreational activities and perform some useful functions in the maintenance of ecological balance.

Dense human population in catchments, urbanisation, and various anthropogenic activities has resulted in over exploitation of wetland resources, leading to degradation in their quality and quantity. Now, there is increasing concern to conserve and restore perishing wetlands and endangered habitats to achieve ecological sustainability.

Wetlands commonly occur in human-dominated landscapes such as agricultural and urban regions (Neely and Baker 1989; Ehrenfeld and Schneider 1991). Studies have shown that negative effect on wetland species and ecosystem functioning can be expected in such areas due to human activities (Ehrenfeld 1983; Morgan and Philipp 1986; Aerrts and Berendse 188; Moore *et al*. 1989; Ehrenfeld and Schneider 1991; Morris 1991). A strong `utilitarian' attitude to the environment has been found among farmers owning vulnerable ecosystems compared to other populations (Wilson, 1992 and 1996). Thus, assessment of the ecological status of wetlands in human-dominated landscapes is

critical for their effective management and protection.

Winkler (1985) estimated that, globally, there had been a 50 % loss of wetlands since AD 1900. For instance, the USA may have lost 54 % of its original total over this period (Mitsch and Gosselink 1986). The largest single cause of this loss was conversion to agriculture (OTA 1984). In central South America nearly a fifth of the wetlands identified as internationally important are threatened by direct drainage for farming or ranching (Scott and Carbonell, 1985) and that 94% of the marshland has been lost since 1930 in Greek Macedonia (Hollis and Bedding, 1994).

The values of wetlands are well documented (Maltby, 1986) but, the implications of their cumulative losses on national, regional and continental scales are not clearly understood. The following review indicates the kinds of impacts that could occur if we lose our wetland ecosystems. Wetlands are home to many plants and animals due to their temporal and spatial variability. They are rich in endemic, rare and endangered species. For example, more than half of Europe's most endangered birds depends on wetlands (Braakhekke and Marchand, 1987). In Belgium 97% of the 306 plants classified as rare, vulnerable, endangered or already extinct are wetland species.

Armentano and Menges (1986) have examined the scale of human impact in altering the role of wetlands as carbon sinks. Their study confirms the fact that the balance of carbon movement between wetlands and the atmosphere has shifted, primarily as result of agricultural conversion. The effect of this shift in terms of national, regional and global climate, and biogeochemical cycling is a matter of considerable current debate and high research priority.

Drainage and other forms of disturbance associated with agriculture are widely identified as the main contributor to wetland loss. Williams (1991) has suggested that globally, 160,600 Km2 of wetlands had been drained by 1995, primarily for agriculture and food production. For instance, it has been, estimated that about 90% of New Zealand’s former wetlands have been absorbed by arable, pastoral and horticultural developments (NWASCO, 1982). Research on the relationships between farmers and wetlands is nearly non-existent in Kenya and rather limited internationally (Wilson, 1996). Similarly, quantitative analysis of the impact of agriculture on wetlands is limited (Beopoulos, 1996) due to insufficient environmental monitoring.

Wetlands are important elements in the global cycles of nitrogen and sulphur (Deevey, 1970). Inevitably therefore, the continuing loss of wetlands through drainage must have significant impacts whose repercussions at present are not clearly understood.

In Kenya only a small proportion of the original wetland area is left in its natural state. Although an exact figure cannot be obtained, it is believed that less than 10% of Kenya’s original wetlands now remain. In many regions, almost all standing freshwater wetlands have been lost. Yet, drainage and other forms of wetland disturbance continue in many areas and the ongoing rate of loss is high. The effects of these losses and modifications would be cumulative and insidious in the long run.

Emphasis must now be placed on wise management. Traditionally, wetlands were regarded as unproductive wastelands, the value of which could only be realized through conversion to some other use (Bond et al, 1988).

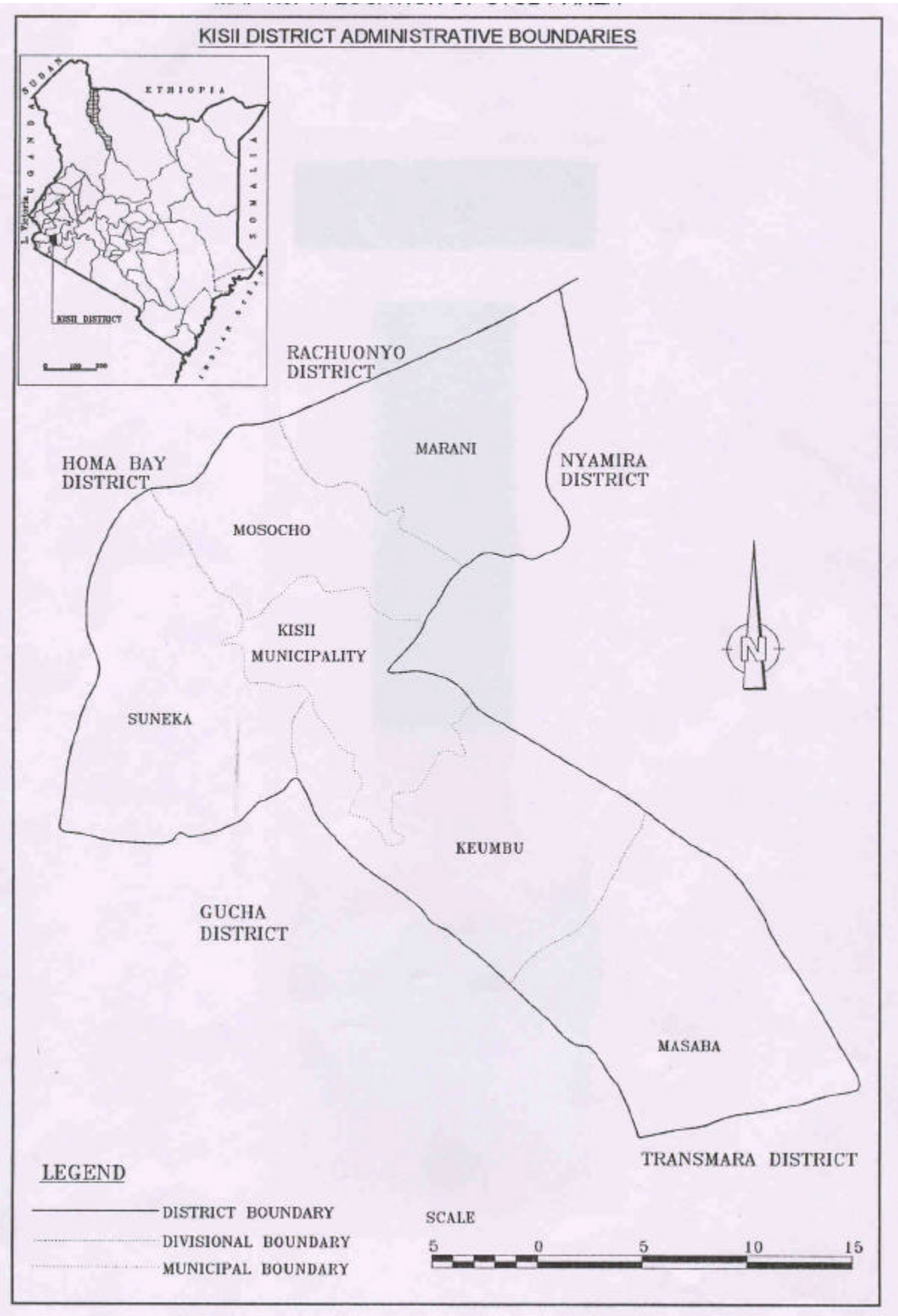
Wetland losses are not easily reversible thus protection and conservation of the remaining ones is of paramount importance. There has been some progress toward protection of wetlands, but the pace has been slow. In the 1960s, the International Biological Programme (IBP) initiated project AQUA and the IUCN began project MAR. These were designed to increase protection of wetlands and to increase awareness of the importance of wetland and peatland ecosystems and the threats to which they were exposed (Maltby, 1986). In 1975 the Ramsar convention came into force and it was one of the world's first international conservation treaties with 45 signatory states, of which Kenya is one of them. Reports in 1987 suggested that the convention was short of funds, was breached by some of the signatories and did not include some crucial nations (Pain 1987). In practise, signatories also apparently tend to ignore the terms to which they are signatory a case the proposed study hopes to look into. There is also lack of an adequate database on wetlands. With inadequate information on extent, structure and function of our wetlands effective management is severely hindered. Despite much effort by IUCN to establish a database on wetlands (Sayer and McNeely, 1984) databases covering areas such as Kisii District are missing.

There has been a growth of interest in wetlands and an accompanying change of attitude (Williams, 1990). In some countries, rates of loss are now slowing (Hollis and Bedding, 1994). At the international level, the protection of wetlands is clearly reflected in the Ramsar convention. This convention plays an important role in facilitating the protection of wetlands of international significance. However, the full protection of the remaining wetlands in Kenya and in all other countries can only be achieved through implementation of management strategies at national or sub-national levels. This conclusion follows simply because most of the remnant wetlands do not qualify under the terms of the Ramsar convention, which is aimed at protecting wetlands of international significance.

In considering the management of wetland areas in Kisii, the study focused on the attitudes of individual wetland users towards wetlands and their management. Wetland users attitudes are a fundamental consideration, by virtue of the fact that most of the remaining wetlands fall within private land. Despite the significance of such wetland users' attitudes, there have been no studies reported in Kenya and very few have been reported internationally. (Kreutzwiser and Pietraszko, 1986).

THE STUDY AREA

With a view to developing some understanding of wetland users in Kenya to wetlands and their use, a survey of rural landholders in one district was carried out. Because the questionnaire addressed issues relating to planning mechanisms, the decision was taken to interview landholders within a single planning unit, and in this case a whole district. The aim was to standardize the survey in terms of the institutional context. The area that was eventually chosen was Kisii District, which is found in Nyanza Province, Kenya (Figure 1). The district borders Nyamira to the east, Gucha to the west, Transmara district to the south and Homa Bay and Rachuonyo districts to the north. This area lies between latitudes 0^0 30' and 0^0 58 south and longitudes 34^0 42' and 35^0 05' East. It occupies an area of about 645 km^2 and it is subdivided into five administrative divisions.


KISII DISTRICT ADMINISTRATIVE BOUNDARIES
ETHIOPIA
SOMALIA
KISII DISTRICT
RACHUONYO DISTRICT
MARANI
HOMA BAY DISTRICT
NYAMIRA DISTRICT
MOSOCHO
KISII MUNICIPALITY
SUNEKA
KEUMBU
GUCHA DISTRICT
MASABA
TRANSMARA DISTRICT
N
LEGEND
DISTRICT BOUNDARY
DIVISIONAL BOUNDARY
MUNICIPAL BOUNDARY
SCALE
5 0 5 10 15

The district is predominantly rural and agricultural about 77% of the level is sustainable for agriculture. There was once an abundance of wetlands in the district but now there are only remnants left. The extensive draining of wetlands for agricultural and settlement purposes accounts for most of the losses. The remnants are of considerable value in terms of their contribution to the natural heritage of the district.

METHODS

In order to gain an understanding of attitudes to wetlands and their management, a questionnaire survey was administered to 200 wetland users in Kisii District. While the sample was relatively small in size, there was a high level of confidence that at least 70% of land holdings with wetlands in Kisii District were covered by the survey. In fact, the survey quite possibly approximates the population of landholdings with wetlands in Kisii District.

The questionnaire was designed to elicit information on:
i.) The attitudes of landowners to environmental issues in general and the protection of wetlands in particular.
ii.) The attitudes of landowners with respect to planning mechanisms that might be used to support wetland protection in Kisii District.

RESULTS

In order to gain an understanding of impact of farming activities on wetlands, a questionnaire survey was administered to 200 landowners in Kisii district. While the sample was relatively small in size, there was a high level of confidence that at least 80% land holdings with wetlands in Kisii district were covered by the survey. Environmental questions dealt with issues that directly related to the local rural environment of the respondents.
The questionnaire was designed to elicit information on: -

i) The activities of farmers that affect wetlands
ii) The attitudes of farmers to environmental issues in general and protection of wetlands in particular
iii) The attitude of farmers with respect to planning mechanisms that might be used to support wetland protection.

Characteristics of the landholding

The landholdings in the district were found not to be diverse in their characteristics. In size, they ranged from 0.5 to 1.5 hectares, with the sample mean of 1.4 hectares. The landholders that were interviewed owned almost all of the land. The mean area of wetland on the properties was 12 hectares, but ranged from less than 1 hectare to 50 hectares. Wetlands occupied, on average, 5% of the landholdings, with a range from 0.2 – 40 % of the 5000 hectares of land included in the survey, it is estimated that approximately 400 hectares (7%) were covered by wetlands. While it is not possible to determine with accuracy the total extent of wetlands within Kisii district, information available suggests that the survey encompassed more than 70% of all wetlands in the area.

The primary land use on the holdings was farming, with 80% of the survey respondents reporting dairying and goat farming of the landowners who were interviewed, 60% obtained all of their household income from the property and a further 10% obtained more than 90% of their total income in this way. Only about 5% of the farms could be defined as rural lifestyle holdings in the district.

Wetlands values and use in Kisii District

The respondents to the questionnaire expressed a high level of concern for environmental and conservation issues in general. In fact, more than 60% of the respondents rated environmental issues as being important or very important (1 or 2 on a 4-point Likert Scale)

In a question that went more directly to the subject of wetlands, the landowners were asked to rate (on a 4 – point scale) several sources of value that might be recognized in wetlands. The four values considered by the greatest number of respondents to be very important were the role of wetlands in maintaining water quality (rated as important by 90% of respondent) and as a habitat for species of socio-economic and cultural significance (rated as important by 91% of the respondents).

Assessments of significance using a chi-square contingency test (at a significance level of 0.05) revealed statistical relationships between several landholding characteristics and some of the ratings of wetlands values by the sample group. The proportion of income obtained from the farm has a significant relationship to the value placed on wetlands as an area for grazing stock, for example of landowners obtaining 95% or more of their income from the farm, 74% considered it to be of importance, while 33% of landowners who earned less than 95% of their income from the farms considered it to be of importance. The proportion of income and the scenic value of wetlands were also found to be statistically related; of those earning less than 95% of their income from the landholdings, 87% considered the scenic value of importance, while only 50% of those earning 95% or more reported that it was important.

Thus, the proportion of income earned from the farm has a relationship with attitudes about the importance and appropriate use of wetland areas in Kisii district. In short, characteristics of the landholder's farm that may be associated with full time farming activity appear to be associated with a more utilitarian attitude towards wetlands. These findings are consistent with other studies that have established relationships between affluence and the level of dependence upon the land, or some other resource base, and conservation attitude and behavior (for example, Kreutzwiser and Pietraszko, 1986; Green and Hefferman, 1987; McDowell and Sparks, 1989; Daoutopoulos and Pyrovetsi; 1990).

It was anticipated that the use of wetlands for recreation might contribute to the formation of a more positive attitude towards them. In New Zealand, a study by Wilson (1992) found that landowners that carried out leisure activities in their private forests had more naturalistic images of native forest. Those who did not use their forest for recreation tended to have a more utilitarian view. In my investigation of attitudes towards wetlands, recreation by the local community was defined to include hunting, walking, fishing and any other leisure activity.

Landowners (70%) in Kisii district who carried out recreational activities in wetlands considered them also to be of importance for grazing. Of those landowners that did not use their wetland areas for recreation only 44% suggested that grazing was an important value for those areas. This result confirms the fact that landowners that use the wetlands for recreational activities may hold a more utilitarian view in general of these areas.

The drainage of wetlands represents one of the most significant and widespread threats to their effective conservation. Amongst the farmers surveyed in Kisii district, drainage of wetlands on the landholding had been carried out by 70% of the landowners. Drainage had been carried out for reasons relating to access, planting of exotic trees species, and increased pasture and productivity. Of those landowners that had carried out drainage, only two had sought consent, as they are required to do by the District Environmental Management Committee. In fact, the general awareness of the consent process was very low, only 31% of the respondents knew that consent was required for drainage works or other modification to wetlands. Another 60% affirmed that consent was not necessary, and 10% admitted they did not know whether it was necessary or not.

The local community's attitude towards wetland conservation

The farmers were asked to state whether they agreed or disagreed with a set of statements relating to the conservation of wetlands. These statements included; the protection of wetlands is important; wetland conservation should not limit utilization of wetland resources and/ or farming activities; there should be enforcement of regulations to curb the conversion of wetlands in the district; there should be regulations prohibiting the conversion of wetlands. A clear majority (90%) agreed strongly that the protection of wetlands is an important priority in Kenya. None of the respondents strongly disagreed. In response to the statement "Conservation should not limit agricultural activities on private land", 60% strongly agreed and 30% strongly disagreed, only 40% strongly agreed with the statement". There should be regulations prohibiting the conversion of indigenous wetlands to agricultural land". A total of 62% disagreed to some extent and 2% had no opinion. However, there was a higher level of agreement (80%) with the suggestion that there should be regulations to control wetland conversion. None of the respondents strongly disagreed with this suggestion, although 10% did disagree and another 10% had no opinion. Thus, while it is generally accepted that conversion of wetlands is important, landowners do not so readily accept that all conversion of wetlands must be stopped, particularly if this might infringe on individual property rights. When asked if thy thought it was important to protect and manage wetlands on all land or just public land, 20% specified public land and 50% stated all land, but included conditions such as that wetlands must be significant, landowners should be compensated and/or that landowners retain access rights.

The awareness of ways in which wetlands can be protected by private landowners was found to be relatively low. Awareness amongst the sample group of the ways in which the government controlled or encouraged the protection of wetlands was also low, with 70% reporting that they had no knowledge of government's role in this regard. The majority (90%) of the landowners interviewed said that they had never been provided with information on the protection or management of wetlands.

In spite of the apparent lack of knowledge of formal mechanisms and approaches to protection, almost 50% of those people interviewed reported that they have considered, or have carried out, protection of wetlands on their farms. Further inquiries revealed that 30% of the respondents had fenced the wetlands. However, of those who stated they have protected their wetlands, some have planted exotic trees in order to "beautify" the area. The planting of exotic trees (Blue gum) can be detrimental, resulting in the drying of the wetlands and other changes in its character.

Furthermore, several landowners who have fenced their wetlands have done it more for the reason of excluding stock, which were getting lost in the wetland, than for the wetland itself. Those who have not protected their wetlands in any way stated reasons relating to the lack of significance of the wetland. Only five landowners stated their opposition to the concept of protection.

Attitude towards Wetland Conservation Mechanisms

Landowners were asked to rank in order of preference five mechanisms that might be used to encourage or enforce the protection of wetlands on their lands. The methods included land use regulations; incentives; voluntary methods; land purchase by the government; public education and advisory services.

As a first preference, incentives and voluntary methods featured very strongly, with 33% and 31% of respondents, respectively, choosing these as their preferred options. Education and advisory services were also popular, with 21% identifying these as their preferred option. Land purchase was selected as a first preference by only 14% of the respondents and 40% identified land purchase as the least preferred alternative. None of the landowners identified land use regulations as their first least favored option.

The overall preference for incentives and voluntary mechanisms is congruent with views expressed by landowners relating to private property rights and also with comments by respondents concerning the costs involved with protecting wetlands, which appear to act as barriers to wetland protection in the district. These views help to confirm the opinions of Local Conservation Officers about the barriers to conservation on private property.

While landowners may not be fundamentally opposed to conservation and infact some carry out conservation on their land, many are opposed to what they see as interference from those involved in conservation. This attitude has been observed in studies elsewhere. In the U.K., for example, Cox *et al* (1988) noted that farmers and landowners perceived environmental control as involving a loss of landowner's autonomy, with no obvious compensatory benefits (Cox *et al*. 1988). Similarly, studies carried out by Napier and Napier (1991) in highly erodible areas of Ohio found that any loss of decision – making responsibility was regarded as a cost. From a somewhat different perspective; Polland (1978) observed that in Norway, the granting of compensation would increase goodwill towards preservation activities.

DISCUSSION

All but a small proportion of the wetlands that once existed in Kisii district have been destroyed. In this area, the imperative to protect what remains is as strong as exists anywhere. There are many factors that will have a strong leaning on the future protection of wetlands in Kisii District and by extension to other parts of Kenya. Public attitudes, national and international forces affecting the economic viability of land-based production, political will, the dissemination of knowledge about wetlands, and the effectiveness of the conservation movement will all have an influence.

Internal to a country like Kenya, the two groups that will inevitably play an important part are resource managers and the local communities / private landowners. Hence the research reported above provides an insight into factors that will be important *vis a vis* a wetlands conservation strategy in Kisii district of western Kenya. While some caution needs to be exercised when generalizing from the small sample taken from the study area, this study has provided an improved understanding of the perceptions of the Abagusii community. Taken in conjunction with the wider survey of planning agencies, some recommendations of general applicability might emerge.

What is perhaps the most important, but not surprising outcome of the investigation reported here is the confirmation of the weak understanding and appreciation of wetlands as places of significance by wetland users in the district. This lack of appreciation is reflected in the cursory survey of the resource managers at the district level, very few of who were able to provide any information on the extent of wetlands habitats within their jurisdictions. The extent of the problem, wetland degradation, is not even known amongst most District Environmental Officers. Further evidence for this has been discovered in the time since the research was carried out, that in the district development plan of 1997 - 2001; important wetland areas in the district were not included in a schedule of priority natural areas but rather targeted by the Forestry Department as important sites for future afforestation programs.

While the importance of protecting indigenous habitats and species in Kenya, and wetlands in particular, was recognized by those interviewed, often thus importance did not extend to the wetlands on their own properties. In fact, for many landowners, the value of wetland lay in the grazing area they provided for stock, brick making, collection of medicinal plants and some people did not consider their wetlands to be worthy of protection. Further more, knowledge regarding the consent process and conservation mechanisms was limited.

A large proportion of the people interviewed exposed a utilitarian attitude towards wetlands. To the extent that the uses are made of these areas cause serious disturbance (e.g. through the grazing of stock, planting of exotic trees, brick making), this attitude is problematic.

Recognition of other use values, which are not a source of degradation, is not necessarily such a problem, however, and may indeed be part of the key to a more effective conservation effort. Hollis and Bedding (1994) observed:

> *"In recent years, wetlands conservationists have been supplementing traditional arguments for saving habitats, based on the preservation of wildlife and aesthetics with something altogether more hardnosed economics".*

While intrinsic values may be at the heart of the conservation efforts, justifications that are

anthropocentric and utilitarian may be an important part of the overall strategy. Thus, an important prerequisite to the improved protection and management of wetlands in western Kenya may be the wider dissemination of knowledge about the full range of values that are based in these ecosystems. These argument need to be made to resource managers, landowners and to the wider public as well.

The research that is reported here advocates for education and information provision. As the comments above suggest, the resource managers themselves need to be informed in the first instance. It is also quite clear that strategies for the protection and management of all natural habitats, including wetlands, must be developed within the context of an established private land ethic. The survey of landowners that has been described here provides further confirmation of the fact that landowners in Africa, including those in Kenya, hold tenaciously to their perceived rights of dominion over their property. Regulatory mechanisms are seen to be a direct affront to these rights and they are not welcome.

Hollis and Bedding (1994) have suggested recently that the way forward may need to involve the establishment of national wetland policies. In Kenya, environmental Lobbyists have fought hard for the implementation of a national policy and thus come via the implementation of NEMA. There is a degree of optimism that the new National Wetland Policy will lead to improved management throughout the country. The national wetland policy may indeed be a model for wetland ecosystems. Provision is made under National Environmental Management Act (NEMA) for the implementation of national wetland policy / statement and so the institutional framework is already in place.

CONCLUSION

The local, national and regional significance of the wetlands of Kisii district need not be over-emphasized. It is no doubt that human activities in the district will continue having broad and devastating effects on the remnant wetlands of this area. This consequently will undermine the ecological and social values of wetlands in this region.

This current situation must be stopped or avoided at all costs through promotion of sustainable utilization of wetland resources. This can probably be achieved through community training, with emphasis on rational, wise and no-destructive utilization. It is envisaged here that the local community is trained to value their resources so that they can safeguard it. Since a fundamental requirement of sustainable use of a resource is such that it promotes conservation, the community will undertake rehabilitation schemes for the degraded wetlands. Other options available include the possibility of evoking traditions, which in the past served well in the protection and preservation of wetlands. Local people (Abagusii) have always had historical and spiritual relationship with wetlands with customary rules enacted by a council of elders to regulate access and use of wetland resources through a mixture of spiritual beliefs and superstition. In this way, sustainable utilization and needs of the local people can be balanced with the natural functions and values of the wetlands.

All efforts should be directed to halting exploitation programmes that may lead to wetland degradation or at worst depletion. Any further loss of wetlands in Kisii District would inevitably

lead to a reduction in the numbers of people the wetlands can support, and a decline in crucial diversity of indigenous species by loss of habitat, destruction of refugia and faunal mixing.

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