

Gender and Social Issues in Natural Resource Management Research for Development

Edited by
Shibru Tedla & Fiona Flintan



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**Organisation for Social Science Research
in Eastern and Southern Africa
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PREFACE

The Organization for Social Science Research in Eastern and Southern Africa (OSSREA), a network of social scientists in the sub-region was established in 1980. Its main objectives are to encourage and promote interest; to engage in collaborative research; and to facilitate scholarly exchange of ideas and publications between individuals and institutions engaged in the study and research in social sciences.

This book is an outcome of a series of research projects carried out through the sponsorship of the Organization for Social Science Research in Eastern and Southern Africa (OSSREA) with a grant provided by the International Research Development Centre (IDRC) of Canada. The overall objectives of the research endeavours were to: (i) build capacity amongst NRM researchers, with emphasis on land and water management, for the integration and practice of social/gender analysis and participatory research; (ii) develop appropriate approaches and tools for social/gender analysis and participatory research; (iii) build capacity within OSSREA and partner organizations/institutions for mainstreaming gender in NRM research activities; (iv) support/enhance interactive networking and information exchange amongst NRM researchers in the sub-region, with focus on gender/social analysis and participatory research; and (v) document the results/process and good practices made by NRM researchers towards integrating social/gender analysis and participatory research. Hence, this book is produced to fulfil, in part, the objectives stated above.

Most development issues cannot be tackled from a single professional perspective or without the participation of the beneficiaries. There is a wide agreement among researchers and development research managers on the value and importance of interdisciplinary and participatory approaches for the design, monitoring and evaluation of research for development project and programs. However, looking at the research for development landscape; one finds that such research undertakings often tend to be sectoral and researchers-driven, with little participation of research results users.

Development problems are multifaceted and so are their solutions, which usually engage technological, institutional and policy issues that require a variety of expertise and experiences for proper understanding and adjustments. This is especially true in the case of developmental issues related to natural resources management that imply the interaction of humans and nature, i.e., of natural and socio-political systems.

Participation of beneficiaries and supporters of the research process ensures that the relevant research issues are identified, and that the efforts will be carried out in a more efficient and effective manner because participation facilitates greater uptake of the results.

Regarding gender, the broad agreement among researchers and development practitioners is that lack of attention to gender related issues in designing research projects limits the value and applicability of the results.

However, most research projects often fail to explicitly incorporate attention to gender and use multidisciplinary and participatory approaches. This is limiting the contribution of research to development and as result to its own profile, which in turn limits the support it receives from government and other donors. That is why this project focused attention on these elements that add value to research for development, to develop capacity and interest for their practice in research for development within the region.

The set of research studies described in this volume have attempted to overcome the gender-based biases found in natural resource management (NRM) research and the challenges of including gender and social issues. The purpose of the research programme was to add a gender sensitive research dimension to already existing research programmes and activities, focussing on natural resources and their management. Most of these programmes had already commenced, but left gaps in the area of social analysis, particularly gender. The contributions found in this volume sought to fill these gaps and provide information on gender differentiated roles, responsibilities, access, control, contributions, etc. and the different relations that men and women have with the environment and natural resources, including different kinds of needs. This knowledge was seen as vital for better-informed decisions and recommendations concerning future natural resource management. Further, several of the chapters indicate how the different gender groups can be integrated into sustainable management of these natural resources based on their roles, relations and needs (see for example, Mawaya and Kalindekaffe, this volume).

Developing the gender component of the research proved challenging, particularly in order to move further than merely looking at gender-related differences to investigating and understanding why such differences existed. Often it was difficult to include women in the research, due to cultural constraints that prevented contact or the fact that women were too busy or perhaps lacked interest to attend necessary meetings or fill out questionnaires. Indeed a limitation of most studies found in this volume is that they only included women respondents who were household heads (i.e. divorced or widowed) and not enough effort was made to include young single women and/or married women.

In order to encourage women's participation and to open up opportunities for communities to benefit more from the research found herewith, some participatory methods of data collection were used with special effort made to encourage women, for example, through creating environments where women would feel comfortable enough to contribute (see for example Rutaisire et al in this volume). Methods used include KAP (knowledge, attitudes, practices) questionnaires, focus group discussions and interviews with key informants; some researchers used more participatory tools including resource maps, seasonal calendars, economic well-being ranking, mobility mapping and resource benefit analyses the value of which in opening up deeper and more complex discussions, on issues such as access and

control of resources was recognized. For example resource mapping carried out by Mawaya and Kalindekafu highlighted the gender division of 'space' – women dominated the household and river space, and men dominated the spaces further away from home, namely agricultural land and forests. This was also linked to their perceived roles as breadwinners and providers of shelter for the household. Further the men and women tended to classify NRM in relation to those spaces that they used: women talking more about the river resources while men talking about the forest. Some researchers used triangulation to ensure that information could be verified and was reliable. Both quantitative and qualitative data were collected. The data was systematically analyzed, for example Macharia et al used Partial Budgeting Model (PBM) for the analysis of agronomic and economic attributes of different low-external soil fertility/conservation technologies, while Gross Margins Analysis (GMA) demonstrated profitability of various technologies across different social and gender strata.

Effort was made to systematically examine and analyse the qualitative information as well as the quantitative. Rutaisire *et al.* (this volume) describe, "qualitative data was in textual form and "indexed" to generate or develop analytical categories and theoretical explanations. These analytical categories were used to describe and explain social phenomena. Each item in the data were checked or compared with the rest of the data to establish consistence. The data were indexed, rearranged according to the appropriate part of the thematic framework to which they relate. The data were organized in the form of themes, sought with a view to providing explanations for the findings; SPSS was used to analyse qualitative data".

Several of the chapters focus on wetland and water resources. The chapter by Naigaga, Kyangwa and Mugidde describes their gender analysis of activities and utilisation in a wetland area of Uganda, particularly those activities that could degrade the environment and lead to risks of human exposure to chemical and biological contaminants. The chapter by Mawaya and Kalindekafu also focuses on a wetland area, namely three riverine systems in Malawi, where no gender analysis had been carried out before. They sought to examine and establish ways on how gender can be mainstreamed into natural resource management in terms of access, control and management, for sustainable livelihoods of different gender groups. A third study focusing on wetland resources is that by Justus Rutaisire et al who investigated the utilisation of wetland Clariid fishes and aquaculture in general and aimed to generate information and propose methods for integration of the gender issues in wetland Clariid fish production and acquisition of technology for their breeding in the Lake Victoria basin.

Alternatively, Girma Jibat et al carried out a gender analysis in order to examine social, economic and cultural factors that determine the access to and control over resources; to investigate decision-making power on the production, processing, marketing and utilisation in agriculture, namely potato farming; and to understand the reasons for non- adoption or partial adoption of disseminated potato production

technologies *vis-a-vis* the role of gender and social interaction. Macharia et al also focused on agricultural production, namely the uptake of soil fertility management technologies based on farmers' social and gender differences and the effect of such diversities on profitability of technologies for small-scale farmers in the central Kenyan Highlands.

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IDRC Supported Projects Leader, OSSREA

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Dr. Alfred G. Nhema

Executive Secretary

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Chapter One

Introduction

Fiona Flintan and Shibru Tedla

Why Gender?

Gender has been shown to be a key determinant of rights to and benefits from natural resources (Watson 2005) whilst it has been proven that gender relations have a direct impact on use, management and conservation of natural resources. Further, women's participation in natural resource management (NRM) has had "substantial positive effects" on illicit use of resources (Agrawal *et al.* 2006).

'Gender' has been on the development and environmental agenda for over a decade. However, still, organizations struggle to include gender in any meaningful way into NRM and NRM research and associated projects/activities. Gender tends to be put to one side as other 'more important,' less sensitive, easier to deal with issues are prioritized.

Historically NRM and other conservation processes have been dominated by men, finding their roots within the hunter-focused and later, the preservationist-focused, policies that were established during the colonial periods. Images of the 'Garden of Eden' romanticized 'wild' Africa and Asia (Said 1978; Grove 1995). The mutually supporting links between local communities and their environment and wildlife were broken as powerful leaders (influenced by Western conservationist organizations) gave priority to the conservation of mega species rather than local livelihoods. People were alienated from policies and processes that had an impact on their land and access to natural resources. As the conservation movement strengthened, increasingly local communities found their access to land and natural resources curtailed and their role in decision making diminished. Women in particular played little role in conservation processes, the movement itself being seen as a 'man's world' and where this world interacted with communities it did so through local male leaders (McClintock 1995).

As conservation moved from one based on protectionism to more community-focused and inclusive processes, the importance of including all natural resource users became evident. Integrated conservation and development projects (ICDPs) and community based natural resource management (CBNRM) sought to rekindle and re-establish those broken linkages between conservation of natural resources and people's development (Western *et al.* 1994; IIED 1994; Rihoy 1995). Natural capital was seen as an important factor in the success and sustainability of local livelihoods. Slowly the value of women's contribution in particular was recognized: their knowledge and experience, together with their roles in both destructing the environment and in protecting it.

As conservation policies developed, so too did theories on how best to achieve true community participation, including women, increasingly seen as a necessity for sustainable development. In the 1980s emphasis on women, environment and development (WED) replaced the increasingly ineffective women in development (WID) policies of the 1970s. However women were still missing out with processes being insufficient in explaining the variety of interests, motivations and power relations in which women found themselves in regard to natural resources and the environment resulting in a lack of appropriate interventions. 'Gender' appeared as a priority and thinking shifted to gender and development (GAD) and gender, environment and development (GED). This opened up more constructive opportunities for a better understanding and engagement with women, gender relations and environment. This took a more confrontational approach the rationale being that through empowerment, women can achieve equity and equality in society: to achieve this both men and women must be involved and interventions developed based on a clear understanding of relations, roles, responsibilities, participation in decision making processes, etc.

Such thinking opened up the need for more gender-sensitive research, which if successful would provide the knowledge needed for making informed and more effective interventions and activities. It was recognized that neglecting gender not only led to the wrong assessment of the success of existing community institutions for natural resource management in terms of participation, distributional equity and efficiency but also distorted the understanding of human impacts on the resource and lead to concealment of opportunities for forming and sustaining successful resource management groups through women's involvement (Ngaiga *et al.* this volume). However, though such a need was recognized, in practice it was more often the case that insufficient gender analyses were conducted, lacking depth and recognition of complex gender relations and processes. Particularly, this has been the case for research linked to NRM, which still tends to be dominated by a natural scientific approach that often ignores people's involvement and relationships and rarely includes a focus on gender.

More recently, thinking on more inclusive approaches has developed further and there has been a greater emphasis on a rights-based approach 'looking to direct action to address gender inequalities, particularly focusing on and promoting women's rights and women's participation. This has also influenced NRM approaches including the development of CBNRM, looking into it and its benefits (e.g. more secure access and control) as independent rights by themselves. Chisakwe *et al.* (this volume) have taken more of a rights based approach to their research with an objective being to identify and propose practical actions that will address gender inequities in access to and control over natural resources.

In order to fill some of the gaps in NRM and gender research and to promote more inclusive and gender-sensitive research in key research centres across Africa, the

OSSREA, with funding from IDRC, has been supporting six research teams to carry out comprehensive gender and social analyses within already existing research programmes. The process started in 2004 with a training workshop for the research teams that were drawn from 19 countries on the inclusion of gender within social and natural resource research.

Six small grants were provided to six research teams on competitive basis. The funds thus made available were to supplement ongoing NRM projects, in order to enable researchers to address gender and social issues in their ongoing research endeavours. The small grants enabled gender to be integrated into these on going research endeavours and allowed a gender and social analysis of the major NRM project to take place. The research projects were carried out during 2004 and 2005, and culminated in an experience-sharing workshop.

This chapter provides an introduction to gender and NRM and sets the context for the following six chapters detailing the research studies carried out. It provides a firm rationale for why it is important to include gender issues in social and natural resource-linked research highlighting the differences found between men and women in relation to the environment and natural resources and why they exist.

Key Gender-Related Differences to Consider in Relation to Natural Resources and their Management

Collection and Utilization

Both men and women utilize forests, wetlands and other ecological zones and their products in different ways, influenced by gender relations as well as age, ethnicity, socio-economic status, location to the forest(s), exposure and level of technology (Malhotra *et al.* 1993; Boffa *et al.* 1996; Ghatak 1995; Flintan 2003; Flintan 2004). Though men's use may be of greater visibility and profile, women can greatly rely on forests and forest products for filling both basic and non-basic needs (Ngaiga *et al.* this volume). In W. Bengal for example, women collect 75% of NTFPs (non-timber forest products) used (Bandyopadhyay undated). However, it is often the case that men and women themselves, living in the same village or even the same household, may not be fully aware of each other's activities, their frequency and their use of forests and forest products (Gakou *et al.* 1994). Thus when talking to household members about resource use, it is important to discuss with *all* members and not only the household head.

Women tend to collect natural resources closer to home, often whilst carrying out other activities, opportunistically, and can be considered to be 'generalists'. Some activities such as fish farming are only possible if found close to the home due to controlled mobility (Rutasaira *et al.* this volume). Women are more likely to work cooperatively to overcome the need for high input of time and labour: on Mount Elgon, Uganda for example 40% of women's total labour is spent within the forest (Scott 1998). Collecting trips may be a social event. There may be restrictions on

women's entry into forests, particularly alone, so working together can overcome this constraint (Flintan 2001).

In Ethiopia, culture plays a dominant role influencing gender roles, responsibilities, participation, etc. Girma Jibat *et al* (this volume) highlight the influence of culture in defining livelihood and agricultural roles. The study also emphasizes that roles should not be assumed: there may be some changes or adaptation at a local level and assumed roles may not necessarily fit. Other research by Flintan (2004) has shown that in southwest Ethiopia (Bonga forest) cultural restrictions prevent women from collecting NTFPs; their husbands will collect the wild cardamom and firewood and the women can then sell them in the market or use them at home. However, in other parts of the region, particularly where coffee growing has increased exposure to traders for example, women play a greater role in NTFP collection and have greater freedom of mobility. Culture can help enforce other rules and taboos. For example in parts of Kenya there are taboos that prevent married women from planting trees, such as eucalyptus. It is said that if a married woman is allowed to plant a tree that will be used for timber, the roots will grow towards the house and overturn it (Mwangi and Houghton 1993).

Divorced, separated or widowed women may also have greater freedom of movement, as found in the wetlands of Uganda and Zambia where their utilization is of greater proportion than married women (Ngaiga *et al.* this volume; Chiskawa *et al.* this volume).

In contrast men tend to undertake planned, long-distance, 'collecting trips'. Men are more likely to be 'specialists.' Men tend to be more involved in cultural and commercial activities and less concerned with domestic use. Charcoal making tends to be the responsibility of men, though trading can be dominated by women particularly those from nearby towns. Hunting of wildlife also tends to be a male activity (confirmed by Mawaya and Kalindekafe, this volume). The reasons for this differ from culture to culture: in Guinea for example, it is believed that women cannot keep secrets and therefore might give away locations of secret hunting grounds (Leach 1999). A similar reason for holding onto medicinal plant knowledge is provided in southwest Ethiopia: men hold the knowledge and pass onto their sons in order to avoid women disclosing secret recipes, cures etc. (Flintan 2004). However, in other parts of Africa, women have been shown to collect a variety of bush meat (Abruqah, 1998; Hunter *et al.* 1990) and play a large role in its trading (Tshombe *et al.* 2000).

Interesting work by Mawaya and Kalindekafe (this volume) raises discussion about the reasons for the differently assigned roles and responsibilities of men and women. The communities stated that these were due to the inheritance of cultural perceptions, beliefs and customs, and the influence of local authority and government. Other factors include 'nature' (the belief that god designed men and women to play the roles they play), sense of duty (feeling that the role women and men play are what they feel they have to perform) and inborn talent (role play is an expression of skills that an

individual is born with). Finally the availability of resources and poverty are also mentioned. Primarily, gender roles are maintained (particularly in rural areas) because everyone in the society believes that an individual has to develop personally with their roles in the households and society. In addition, those who contradict cultural norms and values in relation to gender roles and relations are seen as disrespecting the chiefs and elders and thus are punished by the chief. Fear of being punished and ridiculed by society also maintains the different gender roles. Punishment can take many forms (mostly one pays to the chief livestock which can be a chicken, goat or cow depending on the fine imposed by the chief) and can be costly to the offenders. Roles are assigned at an early age, though fathers tend to be more proactive in assigning roles to children according to gender, than are mothers. Despite this, some men are carrying out 'female roles' including water carrying and fuel wood collection. Both men and women are responsible for cultural practices linked to NRM depending upon their gendered relationship with the resources.

Forests and Forests Products as a 'Safety Net'

The use of forest and savannah products (including bark and seeds) is likely to increase in times of stress or insecurity such as drought, conflict and food shortage. Additionally plants may be relied upon at critical times for their medicinal properties and particularly in situations where no alternatives are available. Women in particular rely on these for household needs, and across Africa are known for the knowledge and collection of 'wild foods' (Mawaya and Kalindekafe, this volume).

Natural resources therefore can be critical at certain times for people's survival: an important contribution to communities' safety-nets. It is more often than not the poor who will rely on such strategies having fewer alternatives than those who are better off. As such, it is important to recognize that although some natural resources can be seen to contribute little to people's livelihoods from a quantitative perspective, they might make the critical difference between life and death in certain situations and particularly for the poor. Likewise, the income from the selling of NTFPs and other natural resources may make little proportional difference to those people of middle to high incomes; but for the poor and very poor, that extra income may be critical to household survival.

Access and Control

Access and control to natural resources are heavily influenced by gender and can be highly complex. As Chisakwa et al (this volume) describe: "access is structured at different levels (household, village, national, etc) by institutions that impose rules and regulations for natural resource management and use. The rules defining access commonly come in the form of property rights, norms and values and establish institutions such as laws and regulations. In reality there are often multiple institutions influencing access to natural resources, which often compete and have overlapping jurisdictions."

Traditionally, women have a lesser role than men in the decision-making processes that affect and control their lives and that of the household or community (Flintan 2003; Watson 2005; Muir 2006; Naigaga *et al.* this volume; Mawaya and Kalindekaffe, this volume; Chisakwa *et al.*, this volume). Their 'entitlements' are lower than men (Macharia *et al.* this volume). This is despite the fact that in some countries such as Malawi, men move into the wife's home but with the women viewing men as the rightful 'heads of household': even if the women find themselves divorced or separated they do not see themselves as head of the household, but rather the position remains unfilled unless they marry again (Mawaya and Kalindekaffe, this volume).

Women and their views and needs may be compromised by a power structure which in rural communities is heavily biased in favour of the male. If they are present e.g. in local-based committees, usually they are 'just' committee members or secretaries to take minutes and rarely voice their concerns. This can be due to cultural, political and illiteracy barriers (Mawaya and Kalindekaffe, this volume). Additionally constraints on their time often limit the opportunities for their participation in such public meetings (Vernooy 2006).

Because information is not always passed on by those attending such meetings (more often than not the men), this can result in women having a less than complete knowledge about environmental issues, including threats to the environment and indeed themselves due to activities such as use of pollutants. For example, Naigaga *et al.* (this volume) show that though both men and women have little awareness of the dangers of chemical contamination within the wetland they utilize on a daily basis, women are less aware than men. This is despite the fact that women (and children) are the primary users of the wetland, with some being more exposed than others due to a number of identified factors including water contact practices; proximity of gardens to chemical and biological contaminated sites; the distance of residential areas to chemical contaminated sites and vector breeding sites; and access to safe drinking water and sanitation facilities.

Gender inequality over access to land is widespread. The majority of African societies, regardless of whether they are patrilineal or matrilineal, confer only secondary, usufruct rights in descent group to women without entitlement to alienate or inherit it. As Mawaya and Kalindekaffe (this volume) confirm in Malawi, though land is inherited through women and they have the right to sell or rent it, it would appear that it is the men who financially benefit with rent or sale monies going to them. And in Zambia while 30% of the land is reserved for women, it is very difficult for women to obtain land title from authorities. The statutory systems in some districts require married women to obtain permission from their husbands before applying for land. Where women can access and own land, it is found that the amount women can access (and farm) tends to be much lower than that accessed by men (Rutasira *et al.* this volume). Further, access to land does not guarantee access to other land-based resources (forestry, water and wildlife) which are governed by different institutional

arrangements. Women are generally ignorant about laws and regulations, worsened by their high illiteracy levels (Chasakwa *et al.* this volume).

Women have been found to be the main farm operators yet have the least say in use of farm resources. Furthermore, they have even lesser say in benefits accruing from investment of their time in the farm enterprises. The impact of different livelihood interventions also varies across different social and gender contexts. In Kenya, it was shown that women earn more on-farm income than men and men earn more off-farm income such as through casual labour. Therefore women and men are likely to differ in their capacity, choice and adoption of different technologies, and hence attention must be paid to such diversities (Macharia *et al.* this volume).

Women's access to other natural resources also tends to be defined through their husbands (or other male relatives). For example access to the 'kobbo' blocks of forest in southwest Ethiopia is controlled by a wife's husband. Though a wife may be able to inherit rights to the block in the event of her husband's death and in the absence of a son, this is likely to involve a fight with male relatives staking claims (Flintan 2004) and an avoidance of the system of *leverite* (where a widow is remarried to her late husband's brother not least, in order to ensure that possessions/resources remain 'in the family' (Flintan 2006). Similar systems may be in place to control rights to trees e.g. those needed for hanging beehives or for timber. Though women may need access to specific trees for specific needs, women have few if any rights: only men's rights are defined being concerned with higher value and 'more important' products. In Malawi (Mawaya and Kalindekafe, this volume) at household level women must seek access authorization from men who are in control of access and use of resources. On the other hand, men have to seek authorization from local authorities to access forest products, wildlife and land resources.

This is despite the fact, as some argue that because land tenure and access to resources is insecure, women have little incentive to invest in conservation practices. In Zimbabwe, researchers found that women are significantly less likely to plant trees for food, medicine and fuel wood in areas where future access is uncertain. Restrictions on women's land rights hinder their ability to access other resources and information. Unable to use land as collateral to obtain loans, women have difficulty in adopting new technology and hiring labour when needed (PRB 2002). This is confirmed by Mawaya and Kalindekafe (this volume) who describe how as a result of men controlling most of the resources, especially those offering higher economic benefits, it means that women have to ask permission from men before accessing or using these resources. In their study, women reported that sometimes they were refused the freedom to access certain resources, especially those with good economic value, having a direct impact on their value of different resources, fulfilment of their needs as well as their resource-based livelihoods.

Findings indicate that agricultural productivity increases significantly when women farmers have access and control to land resources (Mawaya and Kalindekafe, this

volume). And Girma Jibat *et al.* (this volume) highlight the importance of including women within the development of agricultural projects and interventions. The study showed that where this does not happen, negative impacts can occur, particularly for women: in the study area women's labour increased dramatically without great economic or other benefits because decisions were made without their input but impacted on them.

Changes in land use and access arrangements to resources also have a direct impact on both men and women. "Gender relations are.....dynamic and changing as a result of processes of negotiation and bargaining between men and women and as a result of changes in the NR base" (Watson 2005). It is more likely to be men making decisions about access, often undermining women's needs and views and having negative social consequences. For example the increased production of charcoal in Somali region, Ethiopia, has been encouraged by (whilst also continuing to encourage) the enclosure of land. This is having a fundamental impact on open grazing and communal rangeland management for both men and women. Further, negative social and cultural impacts have resulted including increased anti-social behaviour such as alcoholism and chewing of chat, increased domination of men over decision making, greater work load for women, less secure marriage, women traders away from home for long periods of time and at risk from violence, children missing school and less respect of youth to elders, amongst others (Getachew Mamo and Sead Oumer 2006).

Marketing

Women, together with men, can play an active role in trading and marketing of natural resource and agricultural products (see for example Girma Jibat *et al.*, this volume). However, participation, particularly that of women, may be limited by a range of factors including level of mobility and resources, cultural and religious constraints and the type of task in the chain of activities from harvesting to marketing. Single women (unmarried, divorced, widowed or '*de facto*' head of household) are likely to have greater freedom than others. However even here, time and labour demand constrains their ability to travel far (Kepe *et al.* 2000; Monela *et al.* 2000) as well as a lack of business and management skills (Flintan 2006). In general, income from NTFPs even those with added value, remain low. Higher value goods (e.g. charcoal, honey, timber) tend to be controlled by men.

However, in some situations/contexts it may be acceptable for women to dominate production and trade even of higher value goods. For example, in Cameroon women play a central role in honey production and women have been shown how to plant 'bee trees' on their farms. Even in south west Ethiopia women help make the beehives; the hanging and taking down of the hive(s); and sell some of the honey when permitted to do so by their husbands (Flintan 2004).

But then it should not be assumed that if women are involved in harvesting of natural resources and sale, that they are able to control income raised: sometimes men will

take control (see for example Rutasaira et al, this volume). If the woman is able to keep her earnings, though the income may be small, it may be the only means by which she can obtain cash that she has control over. Indeed, men are more likely to respect women if they are raising monies that form a significant part of the household income (ABRDP 1999; Chisakwa *et al.* this volume). NTFPs in particular have been found to represent an important source of income and employment particularly to women, encouraging increased production and harvesting for local trade (Marshall and Streckenberg 2002).

Commercialization

A number of complexly-interrelated factors influence whether commercialization will benefit or harm women's (and indeed men's) socio-economic status. These vary spatially, over time and socio-economic development, and at different stages of a woman's life. But once women have invested money or energy into an initiative they are loath to abandon it, hoping they will receive some return in the future (Watson 2005).

Where women are the main processors of natural resource products, the processing technology tends to be rudimentary, returns on labour are relatively low, and the work is often conducted in or near the family residence. Location matters: that is proximity to markets, transport costs and access to extraction zone and/or intensive agriculture. One feature common in many commercialization programmes e.g. of NTFPs, is an effort to improve processing technologies for a variety of reasons: to improve quality, to increase locally added value, or to increase or accelerate product supply. Some studies of new technology introductions reveal a pattern whereby men displace women from processing. Even where commercialisation has been targeted at products previously controlled by women, women have failed to retain or gain increased income (Neumann and Hirsch 2000; Campbell 1991).

Often women are not as interested in the financial benefits of commercialisation as the social aspects. For example the study of Rutasaira et al (this volume) highlighted that men involved in fish farming prioritised the financial benefits, whereas female respondents prioritised social aspects, i.e. nutritional improvements and social interaction. Further a large proportion of women interviewed (44.4%) did not report any changes attributable to fish farming within the community; while most men (36.7%) claimed that their income had improved tremendously from the time they undertook fish farming.

Conservation and NRM

Involvement in Conservation and NRM

Similarly, women and men play different roles in the conservation of the environment and natural resource management. These roles can be both as destructor and as protector and one should avoid making unproven assumptions. Women tend to exploit

resources for subsistence use, and men tend to exploit for commercial use. It has been suggested that exploiters for commercial use tend to have a greater negative impact and thus women's activities tend to be less damaging and more rational: this is confirmed by Mawaya and Kalindekaffe with their study in Malawi (this volume). Further an often quoted assumption is that women disproportionately suffer from environmental degradation due to their reliance on natural resources to fulfil basic needs etc. Evidences provided in this volume tend to confirm this (see for example Mawaya and Kalindekaffe, and Girma Jibat et al this volume).

However one should not assume that because women traditionally play a nurturing role in the household that they will also protect and nurture the environment (so contradicting Shiva 1988; Merchant 1982); it is more likely that short-term needs will force them to take decisions that compromise long-term protection of resources. As Mawaya and Kalindekaffe (this volume) describe, in Malawi women exploited most of the natural resources in the study area to ensure food security needs in their homes. It is also likely that the needs of men and women will change over time. As Chisakwa et al (this volume) highlight: when communities are very poor the needs of men and women tend to be more similar and will focus on basic requirements. However once these basic needs are fulfilled then it is more likely that the needs of men and women will diverge and become more diverse.

For CBNRM and PFM to work effectively, communities need to understand and support the link between conserving resources and their own development. This can often prove elusive and difficult to achieve. In a study of views and perceptions of conservation in the Bale Mountains National Park, Ethiopia, wild honey production was the only development-oriented activity that local women linked with the conservation of the forests (Flintan 2000). Indeed, Mawaya and Kalindekaffe (this volume) describe how those in the study areas in Malawi did not grasp the concept of 'long-term needs', but only focussed on short-term needs, making concepts such as long-term sustainable development difficult to promote and achieve.

Motivations to get involved in activities, whether agricultural production or conservation of NRM, will differ between men and women (see for example Rutaisire *et al*, this volume; Macharia *et al*, this volume). It is important to understand these differences so the right pressures and influences on such motivation can be made. Further it is necessary to ensure that the right environment is provided to encourage both men and women to take part in conservation and natural resource protection: a deep understanding of such motivations will be needed before decisions on how best to do this can be made. Girma Jibat et al (this volume) suggest that the challenge is not to integrate women into new development and environmental processes, but to recognize that they are already principal contributors to the traditional economy and, through that recognition, elaborate concrete actions to increase their productivity and standard of living, whilst protecting natural resources. An understanding of the real situation is vital to any development effort they confirm.

Impact of Conservation and Management Processes

In general, conservation legislation and protection enforcement measures attempt to restrict use and access; the control of access being with a conservation agency, local (or other) government or perhaps a village-based committee/institution. Where women (and men) have traditionally used resources and now find such use restricted if not banned, if no alternatives exist, they will continue to try to access resources by either finding another source or taking high risks (such as verbal and physical abuse or even imprisonment) to continue (Flintan 2001). In particular this is the case where products are sought to fulfil basic needs such as fuel wood, which can hit women particularly hard. As a result, women may operate under informal arrangements with local law enforcement officers who allow the collection in return for money, goods or services.

Though at a policy level e.g. national policy level, gender issues tend to be mainstreamed (see for example the natural resource policies of Malawi: Mawaya and Kalindekaffe, this volume) and there is emphasis on the inclusion of women and ensuring that benefits accrue to them, in practice this remains challenging. Men are more involved in the development of legislation relating to conservation and management, though it has been shown that women are more likely to obey laws and to access resources using official channels e.g. requesting permission (Naigaga *et al.* this volume).

Often, despite an emphasis on the inclusion of women within JFM (joint forest management) processes and activities since its inception, supported by policy, guidelines, resolutions etc., women are still missing out. Their husbands remain seen as the household head, representing the interests of the whole family; women fail to fully participate in decision-making processes; the rights of widows or deserted women continue to be ignored. And as Chisakwe *et al.* (this volume) describe for the water sector in southern Africa: the complexity of water and gender issues is not captured; women constitute the poorest segment of society and cannot afford to pay the full economic price of water; while patriarchy inhibits effective participation of women in formal institutions for water resources management.

NGOs and governments have realized the importance of natural resource management and its contribution and relationship to development processes. However, though it has been proven that gender is an important factor to consider (not least for reasons discussed above), gender continues to be sidelined and organizations struggle to make any meaningful inclusion. This has resulted in a number of negative impacts for both conservation and the livelihoods and the rural poor. Chisakwa *et al.* (this volume) highlight two in particular: firstly, conservation efforts will lose out on the knowledge that different gender groups which could form the basis for new innovations and adaptive capacity within these programmes; secondly, the evaluation of the impact of conservation and development activities on rural livelihoods will be biased towards men to the detriment of other gender groups.

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Chapter Two

Investigating the Role of Gender and Social Analysis in Agriculture in General and Participatory Potato Technology Promotion in Particular in Selected Districts of Oromia, Ethiopia

Girma Abera Jibat, Mathewos Belisa and Hailu Gudeta

Introduction

Agriculture is the cornerstone of the Ethiopian economy and about 85 percent of its population is engaged in subsistence agriculture. Agriculture contributes more than 50% of the country's gross domestic product (GDP), 90% of raw material for local industries and more than 50% of foreign exchange earnings (Shibru Tedla and Kifle Lemma 1999). And probably as a result of this state of affairs, land tenure has played in the past, and remains to do so at present, a central role in Ethiopian politics.

Over the last fifty years, poverty, particularly rural poverty has become more severe and commonplace and the country's agriculture has been in structural decline (Dessalegn Rahmato 1999). This is evidenced by recurrent mass starvation, loss of livelihoods and ecological degradation as marginal lands came under cultivation in order to feed more people.

Ethiopia has diverse agro-ecology as well as soils that are suitable for cultivating a wide variety of tropical and sub-tropical crops as well as for the rearing of a variety of livestock. Despite such favourable conditions growth in agriculture lags behind population growth. Since the 1950s, agricultural research aimed at generating technologies for the improvement of agricultural production and productivity is being undertaken; and the new technologies thus developed are continuously introduced to the agricultural system. However, the impacts of the introduced technologies are not evident. This may be attributed to the fact that agricultural technologies have not been developed with prudent knowledge of farming systems, farmers' circumstances, social status of farmers and gender related agricultural production constraints. The roles and responsibilities of "household family members" are never seriously addressed by agricultural researchers in development of agricultural technologies.

Gender gaps in resource access and control remain widespread; women and children have less access to and control over resources compared with men. These gender disparities detrimentally affect not only women and children, but everyone in society; gender inequalities have been shown to reduce economic growth in general (Scoones and Thompson 1994; Klasen 1999).

Understanding gender roles and responsibilities in agricultural production and decision-making has substantial role in formulating agricultural research. Addressing gender issues will make the research more comprehensive and demand-oriented. The roles that males and females play in the entire process of production, and the responsibilities bestowed upon them should be reflected in the research endeavour. Since all gender groups have the right to share benefits derived from improved technologies in agricultural development, gender issues need be properly understood, and properly addressed, if the results of agricultural research are to be effectively and efficiently utilized (Yeshi Chiche 2000).

Women participate in all types of agricultural activities (crop and livestock, and natural resource management). Women farmers provide more than half (50-80%) of the total labour input required for crop production and 77% of the labour input required in livestock production. Female farmers are also involved in off-farm income generation despite their considerable household chores (Yeshi Chiche 2000). Hence it is mandatory to recognize that they are principal contributors to the traditional economy; it is only after this recognition is granted that the need for elaborate and concrete actions to increase their productivity will be appreciated and subsequently assessed. It is hence apparent that recognition of gender roles is vital to any development effort, including agricultural technology development.

In Ethiopia the adoption rates of generated technologies have been slow, resulting in low productivity. This is believed to be because of inadequate knowledge of the farmers' circumstances during the development of the technologies, thus constraining the dissemination of the said technologies.

In addition the Ethiopian Agricultural Research System has failed to appreciate the newly emerging thinking including gender perspectives. Addressing needs of gender groups, especially those of men and women, through equal participation in project design, planning and implementation is of paramount importance if technologies are to be accepted and widely disseminated.

In addition information on gender differentiated agricultural roles and responsibilities in rural Ethiopia are inadequate. Women perform a number of productive, reproductive and community roles in rural Ethiopia, and these contributions are not recognized. Of interest to the present undertaking is the identification of the different roles gender groups in agriculture as part of natural resource management. The research also tries to elucidate how the different gender roles played by rural farm household impact on their respective access to and control over resources and decision-making power status, with particular emphasis to potato production.

The research undertaking complimented an ongoing project titled '*On-farm improved potato seed multiplication, demonstration and dissemination Project*' that was being implemented with the financial assistance of the Association of Strengthening

Agricultural Research in Eastern and Central Africa/International Potato Centre (ASARECA/CIP) housed at Baco Agricultural Research Centre.

The major project was being implemented in four districts, Jimma Arjo and Jimma Horro (East Wellega) and Cheliya and Jeldu (West Shewa); however the present project covered an additional district, Horro that is located in East Wellega. These five districts have a high potential for potato production; and in these potato production districts, as elsewhere in Ethiopia, involves all gender groups.

Every member of the household (men, women and children) in rural Ethiopia is involved in agriculture (crop and livestock production), as well as in soil fertility management and water conservation practices. Nonetheless, gender roles in agriculture, including potato production, and related conservation activities are not documented. Therefore, this study was formulated to examine and analyze the gender roles and responsibilities, and the social and economic factors that might influence potato seed production technology promotion as part of natural resource management.

The specific objectives of the study, therefore, were: (i) to examine social, economic and cultural factors that determine access¹ to and control² over resources such as land and agricultural produce as they relate to gender groups and identify the roles played by the various members of households in ownership of land, agricultural production and sharing of benefits; (ii) to investigate (gender related) decision-making power on the production, processing, marketing and utilization of potato; and (iii) to understand the reasons for none adoption or partial adoption of available potato production technologies *vis-à-vis* the role of gender and social interaction.

CONCEPTUAL FRAMEWORK

Gender and Sex

Gender refers to the relations between the sexes, produced by social construction. It is a biological fact that women can give birth or nurse a baby; it is a social construct that child rearing should be left mainly to women. Gender relations and identities are not universal, but vary from culture to culture, from one country to another and often from community to community within a country; and they are dynamic (OSSREA 2003).

Flintan (2003) reported that women have less access to education and health care and fewer economic opportunities. Women are less mobile and tended to be most active around the household. Even though they are usually physically responsible for household cash; they tend to have less decision-making power in the utilization of the said resource. In addition, they lack access to resources such as land and capital). Also low self-image and lack of confidence amongst women are contributing factors

¹ Access is defined as possibilities for participation, use and benefit.

² Control refers to domination, ownership and decision making

to their lack of involvement in decision-making processes (Flintan2003). The study tries to clarify whether or not this state of affairs as it relates to potato production is prevalent in the project area as well.

Gender Analysis

Gender analysis is an approach to understand how men and women, male and female household members, relate to each other in terms of roles and responsibilities, access and control of resources and benefits. It is a tool that facilitates better understanding of the realities of women, men, girls and boys, through systematic documentation of the roles of different members of a household and/or society at large. The gender based analysis leads to the identification as to what extent rights are enjoyed and exercised such as participation in decision-making of access to and the control of resources, of equal opportunity, and of equity between men and women.

BACKGROUND

Gender and Household in African Agriculture

The contribution of women to African agriculture-related work such as harvesting and food processing are better recognized and accounted for than other aspects, such as women's work in land preparation, planting, and weeding. An early assumption in the division of labour in African agriculture was that men cleared the land and women planted, weeded, and harvested; highlighting that men and women had defined divisions of labour in agriculture. However, studies showed that a variety of labour and cultivation pattern exist in Africa as elsewhere in the world (Spring 1994; Wiedemann 1987). In Africa and elsewhere agriculture had become more of women's endeavour, since men often migrated out in search of employment, and were often also engaged in non-productive activities such as war (Spring 1994). Sex ratios of working-age people in rural areas of many countries show that there were more women than men engaged in agricultural work, including processing of produce and that the proportion of female-headed households was on the increase (Spring 1994).

Clear understanding of who did what at farm operation, for example who made which decisions, and who reaped the benefits and made further investments, would affect how successfully any innovative technology could be adapted. In efforts for improvement of agricultural production, the introduction of high yielding varieties or more intensive cultivation or processing methods required more labour than usual in crop planting, harvesting, processing and storing; this extra work often fell to women (Rogers 1980; Ferguson and Horn 1985; Feldstein and Poats 1989)

The Gender Based Labour Division of Ethiopian Agriculture

In Ethiopia, the gender division of labour varied based on farming system across cultural settings and locations, and levels of wealth and prestige. Dessalegn Rahmato (1991) noted that peasant women in Welo have greater decision-making than women in Welaita in terms of cultivation, land use, and cropping plans, "all of which

generally were accepted as male domains". In Welo, men ploughed and sow, and women covered other aspects of cultivation. Dessalegn Rahmato (1991) argued that in Welaita, women did little other than carrying animal manure to farm fields (although female house-hold head perform many agricultural tasks). They are also heavily involved in marketing grain, horticultural and other produce including livestock.

Contrasting '*enset*' production with '*tef*' and maize production in northwest Welaita, in terms of gender differences in labour and decision-making, Sandford and Kassa (1993) argued that those who did the work made the decisions. Women carried out much of the labour on '*enset*' and made decisions on choice of varieties and distribution of produce. They did little in the cultivation and harvesting of '*tef*', which men handled, and therefore, men controlled the sales of '*tef*'. However, women processed the '*tef*' consumed at home, and women might sell any surplus '*injera*' (fermented bread). Men dominated the production and sales of maize, although all household members were engaged in harvesting it.

The location of the fields influenced women's labour contribution and subsequent control. '*Enset*' gardens were close to the homestead and maize fields were often nearby, but '*tef*' fields were often far from home. When both men and women were engaged in the management of sales of agricultural produce, women managed sales of small amounts agricultural products sold at local markets; while men sold larger amounts at distant markets.

In some areas in Ethiopia, women did not participate in crop production. It was considered base for a husband or a father to let his wife or daughter work on crop cultivation (FARM Africa 1992a). For example in Kindo Koysha, women's farm work consisted of cultivating vegetable gardens, decorticating '*enset*', and cutting, collecting and carrying grass for livestock feed (FARM Africa 1992b). Women also processed and sold butter, cheese, '*injera*', '*borede*' (a weak local beer), and '*arake*', distilled spirits.

In terms of decision-making, women decided on sales of vegetable, dairy products, while men household heads were responsible for major farm related decisions, including what food items were to be made available/consumed at home during particular seasons. Women were responsible for their children's clothes, their own peasant associations' fees, as well as contributions to the household income, if household's income was inadequate (FARM Africa 1992a). It is with this background that gender roles and responsibilities in potato production was carried out.

METHODOLOGY

Detail background information on gender and gender relation in agricultural production and marketing of produce, and land titles is necessary to fully appreciate gender-related rural development constraints including constraints in the transfer of

technology. The data generated went beyond the framework of the then on-going agricultural project without undermining gender and social issues within the project framework. Data gathering covered gender related issues impacting not only in potato production technology dissemination but agriculture in general within the study area.

Description of the Project Area

The project area comprises five districts, Horro, Jimma Arjo and Jimma Horro (East Wellega) and Cheliya and Jeldu (West Shewa), all in Oromia Regional State (Table 1). Large portions of these districts are considered highland and potato usually performs well in the temperate type climate of highlands of Ethiopia.

The topographical features represent wide elevations that enabled the districts to have three agro-ecological zones namely 'Dega' (highland), 'Weyna Dega' (mid altitude) and 'Kolla' (lowland) (Table 1). All districts received unimodal type of rainfall; and agriculture (crop production and the rearing of livestock) is the major activity of the districts.

Table 1. The proportion of land areas (ha) based on traditional agro-ecological classification (masl=meters above sea level), lowland (below 1,800masl), mid-altitude (1800-2200), highland (above 2,200masl).

Study District	Zone	Agro-ecology			
		Total hectare	Lowland %	Mid altitude %	High land %
Cheliya	West Shewa	75,894	28	55	17
Jeldu	West Shewa	139,388	19.5	31.7	48.8
Horro	East Wellega	82,650	1.5	59.7	38.8
Jimma Arjo	East Wellega	75,524	29	59	12
Jimma Rare	East Wellega	34,078	18	52	30

Western Shewa Zone is very productive and covers different agro-ecological and climatic zones that are suitable for the production of different horticultural crops, and hence the selection of Cheliya and Jeldu districts in this zone. Cheliya has wider agro-ecologies suitable for potato culture; it is claimed that about 50% of the arable land of Jeldu district is suitable for rain-fed potato production. Jeldu district had become the centre of extensively dependable clean potato seed production in the country.

East Wollega Zone is another highly productive area; and covers 17 districts and most of the districts are food self-sufficient. Of these three districts, namely Horro, Jimma Arjo and Jimma Rare (Table 1) are localities with very high potential for potato production.

Collection and analysis of data

Primary data were collected by use of different participatory rural appraisal (PRA) tools, focus group discussion, key informant interview, activity profile, access and control profile, wealth ranking and household survey. Secondary data were collected from the Ministry of Agriculture and Rural Development Offices of the respective districts, as well the Holetta Agricultural Research Centre where research on various crops including patio is carried out.

Non-structured and structured questionnaires were developed and used for key informant/group discussions and for formal household survey, respectively. The general agricultural data was collected by purposive sampling from 20 peasant associations (PAs), 3 from Cheliya, and 2 from Jeldu, 6 each from Horro and Jimma Arjo and 3 from Jimma Rare districts. Specific socio-economic data related to potato production were gathered through a survey; 275 sample households including men and women were interviewed from three districts only, namely Horro, Jimma Arjo and Jimma Rare (Table 1). Key informant interviews were carried in all of the five study districts. Informants were knowledgeable and well-experienced male and female agricultural extension experts. Group discussions, analysis of activity profile and wealth ranking were carried out in different villages across the study districts, with the inclusion of both gender groups (male and female farmers). Purposively selected male and female farmers of different age groups, education level, marital and social status were included, both during the interview as well as during group discussions. Male and female group discussions were done separately to avoid cultural barrier; in rural Ethiopia women rarely express their views in the presence of men. The primary data were analyzed by simple descriptive statistics using the statistical packages for social sciences (SPSS).

RESULTS

It was possible to recognize that gender roles and responsibilities were highly influenced, among others, by education level, age, religion, ethnicity, and wealth status.

Headship, Ethnicity and Gender Equity

The male-headed households (MHHs) of the districts for Cheliya, Horro, Jeldu, Jimma Arjo and Jimma Rare were 80.4%, 89.5%, 67.0%, 89.9% and 86.6%, respectively (Table 2). Of all the districts studied, Jeldu district had the highest (33.0%) female-headed households (FHHs), probably because of landlessness and

subsequent migration. Age appeared to influence traditional gender roles; for example, the younger the head of the household, the better gender equity and understanding there was e.g., equal labour share, equitable share of resource use and decision makings in almost all matters within the household.

Table 2. The proportion of male and female population of the study districts

District	Types of population					
	Male	Female	Total	MHHS	FHHs	Total
Cheliya	70,935	64,768	135,703	19,209	4,554	23,763
Horro	57,110	52,003	109,113	11,135	1,310	12,445
Jeldidu	94,357	98,209	192,566	24,590	12,132	36,722
Jimma Arjo	48,859	35,553	84,412	11,033	1,236	12,269
Jimma Rare	31,452	32,175	63,627	6,596	1,024	7,620

Source: Cheliya MoARD, 2003; Horro MoARD, 2004; Jeldu MoARD, 2003; Jimma Arjo MoARD, 2004.

In the study area Oromos accounted for a substantial proportion of the population; i.e. for Cheliya (95%), Horro (95%), Jeldu (99.99 %), and Jimma Arjo (95%) and for Jimma Rare (98.8%). The study identified ethnical variations in gender discrimination. For example in Horro district a woman key informant cited an apparently common Oromo proverb; "*Oromoo Biratti Dubartii fi Foon Rakasa*" meaning "*meat and women are cheap*". The interviewees further stated that in earlier days it would have been difficult for women to communicate with men, especially with outsiders, because of gender discrimination. In the past women did not participate in most official and social gatherings. If by any chance they attended such gatherings, they spoke very rarely and had no input into the decision making processes.

Religion and Gender Equity

The people living in the study areas practiced Orthodox Christianity, Protestantism, and "Waaqeffannaa"³ and there were a few Catholics in Cheliya and Jimma Arjo districts. There were very few Muslim residents in most of the highlands of the study area. Religious practice is dominated by two Christian denominations, Orthodox Christianity (65 %) and Protestantism (35 %). The Protestant and Catholic religions

³ Waaqeffannaa is an Oromo religion that is a belief in one God called Waaqa. It is a religion of since time immemorial/antiquity.

somehow manifest better opportunity for gender equity and equality than Orthodox Christianity.

Equality refers to the condition of enjoying substantial similar rights, privileges and protection and being subjected to similar duties. Citizens' equal protection before the law however did not necessarily result in socio-economic equality. For example, in all the study districts, it was evident that there were fewer girls than boys in school, and women did not enjoy equal opportunities in some religions, e.g. Orthodox Christianity, Waaqeffannaa and Muslim religions, in terms of decision-making power and leadership roles.

It was reported that some religions prohibited men to work on certain holidays. For example in Horro and Jimma Rare districts "*Waaqeffannaa*" belief prohibited men from working on "*Garanfasa*", defined as a holyday; on such occasion women, in addition to their regular responsibilities, covered work that was traditionally allotted to men. Orthodox Christians did not work on certain 'Saint Days'. Non-followers of Orthodox Christianity were frowned upon by Orthodox Christians, if the former work on such 'Saint Days'. It was strongly believed by the believers that disaster such as hail storm, strong wind, lightning or flooding will occur, destroying crop and livestock alike, if anyone in that community were to engage in farm activities (ploughing, weeding, and harvesting) on such days.

On the other hand, it was noted that there was no clear association between gender and religious practices. However, age was apparently correlated with type of religion practiced. The elderly, whether male or female, tended to adhere to '*Waaqeffannaa*' or Orthodox Christianity, while large proportion of girls and boys tended to follow the protestant religion, irrespective of their parents' belief.

Education and Gender Equity

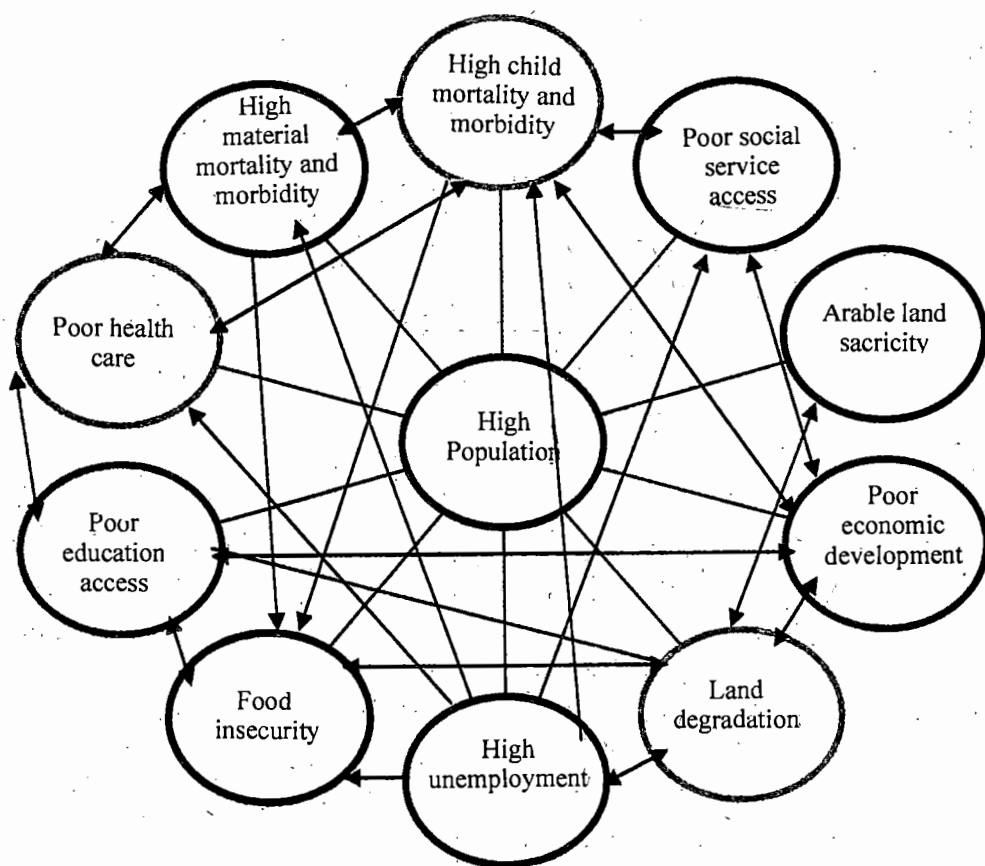
There was an apparent difference between the education levels attained by males and females in all the study districts; males were better educated than females, because of deep-seated traditional influences. Some of the reasons were that communities culturally accepted the local saying "*Dubarrii manaa baate jennan warraa baate jedhani*" that translates as "*Once female go out, they will not come back*". It was culturally taboo to send girls to school. It was presumed that if girls went to school, they would be exposed to various social evils like sexual harassment. In general, there was better gender equity in households where the household head was educated.

Family Size, Health and Gender Equity

Child and maternal mortality were high in the study districts; family sizes ranged from 5 to 10 and the average was 7. The respondents were very much aware of the resultant population increment, and they reported that it was rather disturbing. All the same, household heads would like to have as many boys as possible, hence the high number of offspring. Birth control was rarely practiced.

Population size negatively impacts on social service access, food security, health care, available arable land as well as economic development (Figure 3). The general health status of the population was rather poor as indicated by maternal and child mortality.

Figure 3. The Relationships between Population Increase and Social Conditions.



Some women were willing to practice birth control/ family planning, but they were scared of perceived health problems associated with taking birth control pills. The use of birth control pills was often interrupted because of apparent gastric problems or non-availability of the pills

There was no apparent gender-related difference to health service access. However, it was observed that women were more vulnerable to health problems because of their

reproductive roles, perhaps also due to lower access to financial resources compared with men.

Migration

The young segment of the population, especially boys and recently married men, migrated often, because of land shortage. Married men temporarily migrated to seek off-farm jobs during off-season. More boys and fewer girls permanently migrated in search of jobs after they complete their secondary education.

Land Tenure

Land tenure refers to land holding rights, including land that was passed on through inheritance, rented for an established exchange value, or through an outright sale; the latter is illegal. Land entitlement of farm households had a gender bias, since traditionally females in most cases do not inherit land as lineage members. Rather they only obtain land as wives through their husbands' lineage. Likewise, land distribution by government favoured men; married women did not have the right to own land. In Ethiopia land is government and public property; the ownership belongs to government while people have use-right. It was only when women were widowed that such use-right was bestowed on them. Therefore, land ownership has been traditionally accepted as complete gender-determined phenomenon in the study districts of Oromia. The practice is also common elsewhere in Africa (Flintan 2003).

Land Use System

In the entire study district, land use system operated under traditional mixed crop-livestock farming system. The land use system of farm household could broadly be classified into crop production, livestock production, and tree plantation. On average crop production occupied the largest proportion of the land, followed by the livestock production and tree plantation, respectively. Fertile and good quality land was allocated for crop production, while very small plots and marginal lands were reserved for grazing. It was also noted that small patches of woodland, having regulated as well as non-regulated use, were sporadically distributed over the districts.

Farmers planted trees primarily for construction and fuel wood purposes, as boundary plant or woodlot on small plots of land, and often as homestead plantations. Farmers usually left some trees on their crop land as borders of their farm land. Establishment of homestead plantation with pure eucalyptus stand was commonplace.

Management of land was the responsibility of the household heads who were predominantly men, 80.8 % in Cheliya, 89.4 % and 86.6 % Jimma Arjo and Jimma Rare, respectively. It was further noted that because of limited control over the resources, there could be negative impact on efficiency of resource use. The skilled and energetic household members, the young (boys and girls) may not be allowed to use the land in creative and innovative ways as they did not have control over the said resource. In some highlands of the study districts, for instance in Jimma Arjo, land

was largely owned by old people, while the young who would have worked the land energetically, and subsequently improved agricultural production and productivity, were landless or held very small plots of land, often less than 0.25 ha per household.

Age and Sex versus Physical Activities

Across all the study districts, girls invariably started work-related physical activities earlier than boys. Children less than seven years and aged people, above 60-70 years, were considered incapable of undertaking agriculture-related physical activities, while age-groups, 8-60 years, were considered capable of performing of such activities.

In all the study districts, it was reported that on average females started work-related physical activities at an average age of seven and came to an end at about 60 years, probably because of long years of domestic drudgery; while males started at an average age of 10 years and became inactive when they were about 70 years old. It was instructive to note that women worked longer hours (i.e. on average 16-18 hours per day) than men who worked 8-10 hrs per day. Even though it was often women who become less active at early age compared with men, women never cease to labour until age finally fails them.

The study clearly revealed that gender discrimination begun at an early age. Girls were considered as adults at relatively younger age than boys. They were often required to be obedient and to stay indoors helping their mothers. Even if females enrol in school, they still did face enormous workload after school at home. In addition teachers were not supportive and hence girls were less likely to succeed in their schooling.

Asset Ownership and Power Control

Use and control of rural assets including land, livestock, tree products, seed and crop produce belonged to the household head who were men in the majority of cases, i.e. 80.8%, 89.5%, 67%, 89.9% and 86.6% for Cheliya, Horro, Jeldu, and Jimma Arjo and for Jimma Rare, respectively (Table 3); while household members had nominal access to the resource use. This implied that males had much more privilege than females. However, there was no difference in the size of land holding between MHHs and FHHs as land distribution took place only once and that was during the military government, a decade and half ago. FHHs complained that their MHHs neighbours often push them from their arable land, pasture land and forest lands into marginal lands. FHH heads reported that if they left their land fallow for some time, the land would be claimed by men.

The average land holding was seven ha across the districts, ranging from 0.5ha-12ha; however land shortage was critical in Cheliya and Jeldu districts. The livestock populations comprising of all types of domestic animals varied from 8-32 per household in all the study districts. Cattle rearing was mainly men's domain; while

chicken and sometimes small ruminants were in the domain of women and/or young members of the household.

Table3. Farm household access to and control over resources

Types of resources	Access to	Control over	Factors influencing
Land	M,W,B,G	Head, M/W	Cultural, legal support
Equipment	M,W,B,G	M/W	Culture
Work	M,W,B,G	Head, M/W	Culture
Credit	M,W/B/G	Head, M/W	Legal support, culture
Politics (leadership)	M	M	Cultural, legal support
Time	M,W,B,G	Head, M/W	Culture
Capital	M,W,B,G	Head, M/W	Culture
Education	M,W,B,G	Head, M/W	Cultural, legal support
Employment	B,G	B/G	Culture
Technology	M,W,B,G	Head, M/W	Cultural, legal support

Remark: B-for boys, G-for girls, M-for men and W-for women

Source for all sites: key informant interview and group discussion, September 2004.

The control over of land use was also by the head of the households. Most households' heads did not allow the participation of other household members in decision making of land use. Men were often scared that when their children grow, the children along with their mothers may overtake control of the resources (assets). Participation of household members with regard to agricultural land use decision-making did non-exist and as a result the young members of the household considered themselves as outsiders and did not involve themselves in planning and or implementation of agricultural development activities.

Access to Credit and Extension Service

In principle, there were no disparities between MHHs and FHHs in terms of access to credit and extension services. There was no policy or legal instrument in place that barred women access to credit and extension services in rural communities, as long as they were legally married. The law however did not clearly state that wives and husbands have equal right on control and use of land resources or access to credit and extension services. However considerable differences were observed between the two gender groups in extension service participation; for example during the 2003 cropping season, 5665 MHHs (51.4%) and 316 FHHs (25.6%) respectively, participated in extension services in Jimma Arjo district.

The probable reason why FHHs had poor access to credit and extension services might have been due to the fact that women were too shy to communicate with extension agents, often men. Failure to participate in different official and local meetings, lack of opportunity/time to listen to radio programs whenever relevant information was broadcasted might have contributed to lack of access to extension service as well as credit.

Despite the fact that women contributed substantially to the management of livestock, extension services were not rendered to them. Invariably men participated in informal trainings whenever they were provided to rural communities. Findings elsewhere revealed that women were overlooked whenever technical assistances were provided, even though they were involved in livestock management and milk production, simply because they did not conform to the expected stereotype of "the farmer". In both Kenya and Tanzania, for example studies showed that the extension agents visited female-headed farm households less frequently compared with male-headed ones (Broch-Due 1988). In Egypt, only one in five rural women with small land holdings was able to meet a male extension worker directly; women often obtained information through television or public meetings, and some times from their husbands (Loza 1992).

Household Level Food Security

At the household level, food security was directly influenced by agricultural performance. It was noted that there was a wide disparity in food security between MHHs and FHHs in that MHHs were relatively better food-secured. Women headed households faced multiple constraints in providing adequate food for the family, since they had much more responsibilities and duties than men. Foremost among them were those rooted in the gender separation of farming and family maintenance responsibilities. Traditionally women are responsible for nurturing of children, managing of the household, shopping, cleaning and maintaining the residential areas. All these constraints negatively impacted on access to improved rural livelihood related technologies.

Major Crops Production and Their Limiting Factors

The key informants reported that differences did not exist between MHHs and FHHs in the production of major crops produced in the districts. Barely, wheat, potato, faba bean, field pea, rape seed and linseed were the major crops produced by both MHHs and FHHs in the communities of Cheliya district. The major crops grown in Horro and Jimma Arjo districts by both MHHs and FHHs, in order of importance were wheat, barely, 'tef', faba bean and field pea. The major crops produced in Jimma Rare by MHHs were wheat, maize, noug and linseed and while the major crops produced by FHHs were maize, 'tef' and wheat. MHHs and FHHs were also reported to differ in their objectives of producing those crops. MHHs were reported to produce major

crops in the area for both food security and for the market. On the other hand, FHHs were reported to produce major crops only for the purpose of food self sufficiency.

There were differences in the factors limiting production of major crops in the area. In MHHs limiting factors were, in order of importance, small land holding size, and bad weather condition, high price of fertilizers, market fluctuation, lack of appropriate and timely delivery of technologies, and lack of knowledge. On the other hand, in FHHs production limiting factors in order of importance were lack of credit, shortage of labour force, bad weather conditions, high price of fertilizers, market fluctuation, lack of appropriate and timely delivery of technologies, and lack of knowledge. FHHs did not consider small land holding as a major constraint and this may be because shortage of labour required for ploughing and or fencing, as both were considered critical by them.

Potato Production and Its Limiting Factors

Both MHHs and FHHs have similar perceptions on potato production *vis a vis* production of other crops. Potato production was considered as the first priority as compared to other crops because of its contribution to food security, market value, and double cropping advantages, in addition to its utilization in different dishes.

The limiting factors for potato production for MHHs were market fluctuation, lack of cooperatives and lack of training in potato production and storage techniques and failure in timely utilization. On the other hand, in FHHs, shortage of labour for fencing and ploughing, market fluctuation, lack of cooperatives and lack of training in potato production and storage and utilization were reported as limiting factors

There existed differences between MHHs and FHHs in the types of local strategies employed to mitigate the limiting factors of potato production. For example, to mitigate lack of training on potato storage, MHHs used trained neighbouring farmers to construct storage from locally available materials. On the other hand, FHHs hired labour if they have oxen, and gave their land for sharecropping if they did not, in order to circumvent critical problem of shortage of labour force required for ploughing and fencing.

Both MHHs and FHHs residing in ASARECA/CIP assisted potato project districts. produced the same varieties. Both MHHs and FHHs were utilization improved varieties primarily because the improved varieties' high contribution to household food security, their high yield and high market value, resistance to disease and pest tolerance; qualities that were not present in the local varieties but consider important by both MHHs and FHHs..

Farmers, irrespective of gender, reported that they locally employed different indigenous strategies to overcome most of the potato production constraints such as: (i) trap plants for control of insects, especially red ants; (ii) land renting and share cropping to overcome land shortage; (iii) on-farm selection of health and quality seeds

and sometimes purchase of seeds from local market to overcome lack of improved seeds; and (iv) fencing and guarding to reduce wild animals.

The major seed sources of potato varieties were the open market, the agricultural research stations and or neighbours. Seed sourcing was reported to be a gender-biased activity; men often accessed seeds from off-farm sources (open-market or research stations), while women used on-farm produced seeds of neighbours.

Household Wealth Status

Farm households were categorized as poor, medium and rich, based on landholding size, livestock ownership, number of oxen, annual produce (amount), improved technology uptake potential and the type of houses owned (thatch or corrugated iron sheet roof) (Table 4). Based on these criteria, the farm households of Jimma Arjo highland peasant associations were categorized into rich (10%), medium (60%), and poor (30%); of the rich, the majority was MHHs

Table 4. Criteria used for categorizing farm households into wealth status in Jimma Arjo district

Poor	Medium	Rich
<ul style="list-style-type: none"> • 0.25 ha of land • No sheep • No oxen • May or may not own poultry • Wage labourer • Poor sanitation of feeding • Poor clothing • No children go to school • Yearly hand to mouth food • Poor land management • No technology adoption 	<ul style="list-style-type: none"> • 0.5 ha of land • 1-5 sheep • A single or a pair of oxen • Some of his/her children go to school • Five months of food self sufficiency per year • Medium housing (may be by iron sheet or thatch) • Medium family size • Tries to be rich • Medium with all aspects 	<ul style="list-style-type: none"> • 3 ha of lands • 10 heads of cattle • 4 pairs of oxen • 4 pairs of oxen • 10 quintals of produce • All his or her children go to school • Good technology adopter • Risk taker in technology adoption • Iron sheet corrugated roofing

Soil Erosion, Degradation and Conservation Strategies

Most of the highlands of western Oromia were vulnerable to soil erosion as a result of absence of permanent soil conservation structures, improper and continuous cultivation, occurrence of erratic and intensive rainfall, and indiscriminate clearing of vegetation cover. Potato cultivation, some verities more than others, contributed to soil and water conservation, hence abating of soil erosion; however this would be limited to the potato plots and small down-side plots. Traditionally different conservation methods like terracing, contour ploughing, tree planting, establishment of grass strips, ditches, gully checks and "ya'a basu" were reported as strategies followed by both MHHs and FHHs.

GENDER DIFFERENTIAL ROLES IN AGRICULTURE

Members of the households (i.e. men, women, boys and girls) in all of the study districts had defined responsibilities in agricultural production oriented activities. Ploughing was generally regarded as a duty of men and boys; while activities like milking, barn sanitation, and poultry keeping were responsibilities of women and girls. Weeding, "*messa*", collection of harvested crops and harvesting of beans, flax, were mainly handled by women, with some support from men and boys. Girls, in the absence of boys, were involved in guarding of livestock; boys and girls alike were engaged in poultry and sheep rearing activities. Ploughing, harvesting of some crops, house construction, fencing, tree planting and kraal rotation were regarded as men's activities.

In general land preparation, weeding, hoeing, collection of harvested crops from the field to threshing areas, barn sanitation, poultry and sheep production and guarding of small animals (i.e. sheep and goats) were regarded as female activities, while both males and females were involved in guarding, collection of crops and storing marketing and livestock feeding activities. Horticultural production like onion, fenugreek, and red beat and head cabbage, wherever they were produced, were regarded purely female activities. Feeding of milking cows, poultry, and goats' kids and lambs and calves of milking cows and sick animals' management were considered responsibilities of female members of the household.

All members of the poor farm-households might be engaged in crop production as hired hands, while only boys might be involved in livestock production. Off-farm activity like petty trade was usually practiced by all members of the household irrespective of sex and age, especially so in poor farm-households. Livestock trade was carried out by men, blacksmithing by men and boys, pottering mainly by women and lumbering by men; while local drinks like "arake" and "farso" were prepared mostly for sale by women and girls, the latter is commonplace in poor farm-households.

From overall farm household activities, crop production had the largest share (45%) in terms time spent, followed by domestic chores (30%); while livestock production accounted for only 25%. Hence, overall contribution of women accounted for 36.04% and that of men 35.2%; while the rest (29.68%) was shared by children (boys and girls) for overall farm related household activities.

GENDER DIFFERENTIAL ROLES IN POTATO PRODUCTION

Gender desegregated roles and responsibilities of household members in agriculture in general and in potato production, utilization and marketing in particular were investigated in three districts of East Wollega and two districts of West Shewa Zones as outlined in the tables below (Table 5 and Table 6). In the preparation of the tables (Table 5 and Table 6) different activities required for potato production, storage and marketing are allotted an estimated portion of the total time it takes to carry out the said activity; the portion of the time allotted for a particular activity is again shared among different gender groups based on their relative level of engagement in the said activity.

Traditionally, potato including some other horticultural crops such as onion, garlic, cabbage, fenugreek, red beat, carrot, and pepper are regarded as women's crops. These roles were probably defined based on proximity of site of production to the homestead.

The study revealed that female contribution to overall potato production and use (weeding, harvesting, marketing and home processing of potato) in terms of labour and time input, was conspicuously higher (73%) than that of males (27 %).

Table 5. Gender-based labour contributions for small scale potato production; different activities are allotted a portion of the total time it takes to produce, store and market potato; the portion of the time allotted for a particular activity is again shared among different gender groups

Type of activity	Percent share	Gender share (%)			
		Boys	Girls	Men	Women
Land preparation	10	3	2	0	3
Ploughing	5	1	0	4	0
Planting	5	1	1	0	3
Weeding	30	4	6	0	30
Guarding	10	2	2	4	2
Harvesting	10	1	2	1	6
Marketing	10	0	2	0	8
Processing	10	1	2	0	8
Seed selection	5	1	0	2	2
Seed storage	5	1	0	1	3

Table 6. Roles and responsibilities of household members in potato production, utilization, marketing and natural resources, soil and water management across districts: Remark: B=boys, G=girls, M=men and W=women.

Types of activities	By who	When	Why
Ploughing	M,B	Jan. to March	Cultural influence
Land preparation and planting	W,G,B	March	Efficiency and effectiveness Men's participation in other activities
Weeding	W,G,B	Ranges from 2-4 weeks after planting depending on rainfall and variety	Efficiency and effectiveness Men's participation in other activities
Earthling up/hilling	W,G,B	After two times of weeding depending on rainfall condition	Men participate in other similar field activities
Disease identification	W,M	Between seedling emergency and full flowering	Male has rich experience and joint responsibility
Disease control	M	Between seedling emergency and full flowering	Culture and more access to extension and communication
Soil fertility and water management	W,G,B,M	Before and at planting	Efficiency and effectiveness Share of responsibility
Water conservation	W,G,B,M	Before planting	Efficiency and effectiveness
Protection from wild life: fencing /guarding at night	W,G,B,M	Starting from planting date	Natural differences, family protection, division of labour
Protection from domestic/wild animals in the day: fencing /guarding	W,G,B	Starting from planting date	Natural differences, family protection, division of labour
Harvesting	W,G	End of June to Sept.	Culture and experience
Storage	W,G,B,M	Sept. to Jan.	Efficiency and effectiveness
Processing/utilization	W,G	After harvesting	Culture and experience
Marketing	W,G,B,M	End of June to Sept. After Jan. for seed	Efficiency and effectiveness

Sources for all the information: Key informant interview and group discussion, September 2004.

Land Preparation/ Ploughing

Land preparation refers to clearing, ploughing, disking, levelling, the breaking down of large clods, removal of remnant stalks and non-decomposed crop residues, and weeds; applying household garbage or composts or farmyard manures and making the soil very smooth/fine for seed tubers; preparation of seedbeds, rows, and ridges or furrows where potato seed tuber are planted. Ploughing activities in potato production were the responsibilities of men.

For example men made rows for planting with the help of oxen plough, while women, girls and boys were engaged in planting of potato tubers, removal of remnant stalks and breaking down of the large clods and other activities that are part of good land preparation for improving the germination and establishment of the crop.

Potato plots that were repeatedly ploughed during the dry season to favour vigorous and healthy plant growth were free from weeds. Most potato plots were double cropped as early potato maturity enabled double cropping. This had two advantages, i.e. more food was produced per unit of land and insects and pests were better controlled as a result of repeated ploughing.

Ploughing is an activity reported to be handled by only men and some times supported by able bodied boys. The time of managing this activity is mainly between February and March and the reasons reported for men's role and responsibility were their rich experience of ploughing, physical strength and cultural influence of not involving female in ploughing.

Site Selection and Production

Choice of suitable sites required for potato production in terms of soil fertility, proximity to homestead slope and precursor crops by both MHHs and FHHs were similar. Both MHHs and FHHs preferred black and fertile soils nearby homesteads. Winter barley or "Garbuu Birraa" was reported as a preferred crop for double cropping with potato.

Both MHHs and FHHs did undertake seed selection and they were equally conversant in this issue. The time of selection was before planting, either on the field by looking at the number of stems, stem length and resistance to disease or after harvesting, by looking at the tuber eye and the yield. However, the participation of men in seed selection was higher as compared to other members of the family, even though women, boys and girls also participate in seed selection and storage of selected seeds. In general, among different potato varieties, good quality (in terms of tuber size, taste, shape and colour), high yield, disease and pest tolerance, adaptation to the environment, maturity (early, medium and late) and market demand were reported as the seed selection criteria by both MHHs and FHHs.

Management of Potato Fields

Planting of potato was usually handled by women, boys and girls; while men made rows by oxen plough to facilitate planting. Weeding was carried out by women, girls and boys. The time of weeding was two weeks to a month after planting, depending on rainfall condition. Even though all the family members were involved in the activity, the contribution of women was much higher than the rest of the household members because they often stayed at home (domestic dwellers) and potato was often cultivated close to the homestead. The contribution of girls and boys in this activity was next to women in prominence; while that of men was minimal.

Damage by domestic and wild animals was a critical problem that limited area expansion for potato production; particularly damage by porcupine was the most frequent. Potato production suffered from trampling by domestic animals as well unless properly fenced. All members of the household were involved in fencing activity. While men and boys played key roles in guarding the potato farm at night; during day time guarding was usually handled by women, girls and boys in that order level of engagement.

Roles played in disease identification by women and men differed depending on the district; the lead role was taken by women and men in Cheliya and Jimma Arjo, respectively. In general this activity was identified as a responsibility of both men and women; while disease control was handled by men. The latter activity often involved an agricultural extension agent who often was contacted by men. It might not be an easy task for women to travel longer distances in order to contact extension agents.

Soil fertility management was handled by all members of the household; however men took the lead role when chemical fertilizers were applied, while women girls, boys and men, respectively, in that order of level of engagement handled soil fertility replenishment through use organic fertilizers (manure and household garbage). Men and young males played lead roles in kraal rotation; while women, girls and boys participated in manure application as key actors.

Harvesting and Storage

Harvesting of potato for consumption on daily basis was managed by all members of the household. On the other hand bulk harvest of potato for marketing was often carried out by men using draught animal power. In general, women and girls took lead role in potato harvesting.

One of the crucial problems challenging the smallholder potato-producing farmers was lack of appropriate technology to reserve seeds for the forthcoming cropping season. Potato tuber seeds are living organs with high moisture content as compared to seeds of cereals. Hence, there was need for a proper storage system that could keep storage losses at minimum.

Storage was reported to be handled by men, women, boys and girls alike. Time for storage was immediately after harvest and continues till market time for seed. In other words, it could range from September to March or even much longer, based on planting time.

Marketing

Most farmers (93.2 % of respondents) provided potato for the market. Of the respondents, 65% reported that the amount of the produce to be sold was decided by both men and women; while some (22.6%) stated that it was men only that took such decisions; while still others (10.5%) reported that women alone decided on the matter. Men were engaged in potato marketing when production was in bulk and markets for the sale of produce were far away from home, while small amount of produce were sold at local markets by women.

Soil Fertility Management

Soil is a fundamental resource for the crop growth; the fertility status of soil determines the growth of crops and yield. Soil fertility is among the many constraints limiting the production of different species of crops including potato.

Soil fertility management was reported to be handled by men, women, girls and boys in Jimma Arjo. The time of soil fertility management spans the whole year, after harvest and before planting as well as during the growing season. All family members participate in soil fertility management; however, men play the leading role both in this activity. Over all the study districts, with no exception, none of the potato farmers use inorganic fertilizer, except when they receive supply of improved seeds and fertilizer by Potato Seed Technology Transfer Project of ASARECA/CIP.

Soil fertility replenishment through application of manure and household garbage are handled by women, girls, boys and men, respectively, in that order of level of engagement. Manure commonly collected from cattle, sheep, goat, donkey and horse used in the community for soil fertility management and lead role is played by women and girls. Nonetheless, soil fertility enhancement by use of crop residue is not common in Cheliya highland.

It is important to note that there is no experience of inorganic fertilizer application to potato plots; traditionally farmers of the district practices kraal rotation on potato plots. Men and young males play lead role in kraal rotation while women, girls and boys participate in manure application as key actors.

GENDER DIFFERENTIAL ROLES IN ADOPTION OF TECHNOLOGY

Adoption Factors

Potato technology adoption was positively related to family size (large families had a higher technology adoption rate than smaller families), to level of education, to land holding and wealth; households with larger land holding and relatively wealthy were more likely to adopt the technologies. Suitability of the agro-ecologies was also an important factor determining technology adoption level, and Jeldu district was an important area of production.

Gender related preferences of potato qualities, such as early maturity and big tuber size - qualities preferred for marketing and processing by women - facilitated the adoption of potato technologies across the districts. Since potato is considered homestead crop, and often managed by women; women contributed positively towards adoption of technologies for better management of this crop. Time of potato harvest coincides with period of cash shortage for household expenditure, encouraged further women's involvement in potato technology uptake/adoption. Potato production technology adoption and gender relationships, therefore, were observed to have had significant reinforcing effects. Nonetheless, women claimed that the lack of control over resources, land and cash, made them unable to decide on the extent of the area to be planted, on the type of land to be used for potato production, and the amount of produce to be used for marketing and domestic purposes, respectively. In addition women did not benefit from the official and non-official trainings offered to facilitate clean potato seed production and distribution. This was because mostly men participated in every type of training whether the training was relevant or not to their identified role in potato production.

Impacts of Potato Technology Adoption

The majority of respondents (89.6%) stated that there was an apparent change in potato production i.e., increase in area of production, quality and enhanced market demand, since the introduction of potato technologies through participatory technology promotion. Improved (technology input) varieties were preferred over non-improved ones for various reasons; taste (37.2%), size (bigger tubers) (26.7%), and for both characters (33.3%); while 96.1% of the respondents preferred improved varieties because their high market demand.

Traditional gender-based potato activities and crops domain totally changed as the potato crop production became commercialized men took over potato seed production activities. If the potato seed technologies were adopted for small-scale production, women would have benefited by selling some portion of the product for house expenditures, and other gender groups would also have had access to such produce. However, since the adoption of potato technologies favoured specialized seed production for large scale farms, men were the ones who often benefited from income generated through sales of the produce.

CONCLUSIONS AND RECOMMENDATIONS

Most household members participated in farm activities as a group. Therefore, it was very vital that gender roles be identified in such group activities. Technology transfer was often hindered when intra-household dynamics were not taken into account. The present study revealed that often women provided the extra labour required for successful technology uptake and much more so for potato production and hence facilitated its technology transfer.

Most male and female key informants and group discussion participants pointed out that the adoption and uptake of technologies was determined by both men (the husband) and women (the wife) in most cases. It is important to note that introduction of some technologies like those aiming at potato improvement might increase work burden of women. It is, therefore, essential to involve women throughout the process of adoption and development of technologies, especially since they are the ones who are in a better position to identify the essential qualities of the produce. It was only when gender roles of household members are identified and enabling environment created, that sustainable development can be realized.

Although the contribution of women in undertaking agricultural activities in general and potato production, marketing and utilization in particular, was high, the decision of how much to produce, where and when to produce and the amount of the produce to be sold and or consumed at home was dictated by men in most instances.

Gender division of labour has dynamic features that change with the production system and over time. And also it depends on level of education and wealth status. Gender roles in potato production are apparently well defined, men have the main responsibility for ploughing and harvesting of cereals, while women are mainly responsible for land preparation, weeding and in some cases harvesting. In addition, some crops are women's domain (sweet potato, potato, onion, garlic and fenugreek); the experience of women and men differ based on their respective responsibilities. Technology development and dissemination should thus take gender roles and responsibilities into account if developmental objectives are to be achieved.

Men are involved in numerous social and political affairs unlike women. They decide on issues affecting the development of their household and community without any input from women. Asset primarily belongs to men, since men are heads of their respective families. Men sell the produce including livestock, and they keep the proceeds for their own use, with little being provided to the rest of the family and this provides the evidence for gender discrimination/domination. But because of cultural stereotypes, women themselves have accepted this domination by men; unless women are empowered and the men appreciate the empowerment, there will not be any gender equity.

There is no clear and distinct role assignment amongst different gender groups as far as soil fertility management is concerned; however men and young males play greatest role in kraal rotation, while women, girls and boys participate in manure application as key actors.

Generally, this study revealed that there was no gender equity and equality between men and women in rural Ethiopia as elsewhere in other developing countries due to impacts of culture reflected in traditionally-accepted social norms that put a lot of work load on women without commensurate benefit as they often had very little, if at all, access to and power over control of resources.

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Chapter Three

Integrating social and gender analysis in evaluation of choice and profitability of soil fertility management technologies for smallholder maize production in Kenya

J. M. Macharia, S.K. Kimani, L.N. Kimenye, J.J. Ramisch

INTRODUCTION

Intensive cultivation without adequate soil fertility replenishment over the years is one of the major causes of declining *per capita* food production in central Highlands (Swift *et al.* 1994). According to Lynam and Hassan (1998), the last three decades have also witnessed significant changes in farmers' socio-economic and institutional circumstances. There has also been failure to consider variability in needs, constraints and interests of men, women and children in development and extension of soil fertility management (SFM) technologies. This has caused low adoption and profitability of such technologies. There has been, therefore, a steady increase in number of risk-averse, small-scale farmers especially women who cannot afford costly external inputs such as inorganic fertilizers. The overall effect has been profound decline in soil fertility and shortfall in household and national food production.

Similarly land, labour and capital availability and productivity have decreased over the same period. This has posed enormous challenges to resource-poor smallholders and as a result agricultural production has declined and rural poverty assumed astounding dimensions. This presents new challenges to biophysical and socio-economic research, extension and policy. Technologies from research on integrated nutrient management (INM) are many and varied. However, farmers' socio-economic characteristics including gender, technology attributes and resource constraints have not always been considered in development and packaging of agricultural recommendations. Presently, introduction of gender as a significant variable in analysis of utility of technologies and their viability is a relatively new concept that is less understood by many farmers, extension agents and other stakeholders.

Kenya's smallholders are highly heterogeneous. They occupy much of the available agricultural land and are largest employers of rural labour. They have different farm sizes and capital endowment, are of different age and education levels and belong to different social and gender domains. Yet all face similar production constraints, risks and uncertainties, such include high input costs and low producer prices, poor road and market infrastructures, lack of credit and technological constraints.

The study therefore sought to address this technology gap by looking at gender differentiation in analysis of choice and profitability of the existing SFM strategies for small-scale, maize-based production systems in central Kenya. Given the resource constraints facing rural smallholders, there is need to guide farmers on judicious decision-making and economic efficiency in productive resource allocation. Only those technologies that are profitable should be adopted.

The study was conducted within an ongoing project framework entitled: "*Integrated Soil Fertility Management (ISFM) Project: Farm Stratification and Use of Organic and Mineral Nutrient Sources for Improving Maize Production in Central Kenya*". KARI was the recipient organisation that administered the Rockefeller research grant. The main collaborators were Tropical Soil Fertility and Biology Institute of CIAT (TSBF-CIAT), Ministry of Agriculture (MOA), and University of Nairobi (UON).

GENERAL BACKGROUND

Gender in Agricultural Production

Intensive land-use systems practiced in many parts of sub-Saharan Africa (SSA) without adequate nutrient replenishment has led to massive plant nutrient depletion, decline in *per capita* food production, malnutrition and food insecurity (Lynam and Hassan 1998). The most affected social groups are women and children who have limited ability to cope with distressing effects of malnutrition, hunger and poverty. The livelihoods needs of men and women are not always the same, because of their different roles, responsibilities and resource endowment in any one social system (Pasteur 2002). The impact of different livelihood interventions also varies across different social and gender contexts. Women and men are therefore likely to differ in their capacity, choice and adoption of different technologies, and hence attention must be paid to such diversities.

The most pressing concern in Developing Countries (DCs) today is how to feed their spiralling populations from a fixed natural resource base (NRB). This, therefore, means that land, water and tree resources must become increasingly productive. However, there are certain factors that mitigate such achievements. Such include depleted NRB, poor road and marketing infrastructures, low adoption and profitability of agricultural technologies across different gender and social classes, lack of access to credit and dynamism in socio-economic systems in time and space.

Gender is not a new concept in African agriculture; however it has not been recognised as an important concern in agricultural research (KARI 1998). Gender embraces all socially given attributes, roles, activities and responsibilities connected to one being a male or female in a given society. Important gender categories include men and women, boys and girls, young and elderly, male and female-headed households. Gender in any social system has great potential in making significant impact in farm incomes and food security. This therefore implies that food security would improve if different gender roles were integrated into agricultural research and

development (R&D) programs. Different roles and responsibilities are placed on different gender by different social systems and these are critical determinants of access to and control over productive resources such as land, cash crops, and livestock products. This also determines entitlement and power among men, women and children.

Soil Nutrient Depletion in sub-Saharan Africa (SSA)

Traditionally, agricultural output increase in SSA has been achieved through expansion of cultivated area. There is no adequate land today into which increasing farming populations can continue to expand and consequently this has led to widespread degradation of continent's NRB (Lynam and Blackie 1994). In the past, environmental and soil fertility decline has been addressed through shifting cultivation, more so by men-dominated initiatives. Women played little or no role and were therefore marginalized and dominated (Flintan 2003). Nevertheless, due to increase in population pressure, traditional practices of NRM have become both obsolete and untenable over time. This in effect has led to environmental degradation, nutrient depletion, hunger and widespread poverty. Alternative profitable and sustainable ways must, therefore, be quickly found to restore lost soil fertility and NRB productivity.

Utilization and viability of smallholder SFM technologies are influenced by political, social, economic and institutional constraints. Decision to adopt any SFM technology would be based not only on profitability alone but also on conceivable tangible social and cultural benefits. According to Doss and Morris (Doss and Morris 2001), farmers will adopt technologies if such technologies don't seriously disrupt existing farming systems, jeopardise their subsistence and introduce additional strains on already constrained and limited resources. Profitability and returns to land, farm labour and working capital are some of the criteria used in decision-making process. However, in this and other studies, gender aspects are missing and constraints to adoption of technologies across gender is completely ignored. It is on these premises, therefore, that this study sought to analyze choices of technologies based on their attributes, farmers' characteristics and the effects of gender differences on these choices.

According to World Food Summit, food insecurity has become a global concern in the 21st century (FAO 1996). It is most acute for women and children who are the most vulnerable social groups. In addition, women are adversely affected by cultural prejudices that hinder their access to and control over production resources. High costs of inputs, lack of credit, land, labour and technical requirements are some major constraints to adoption of many SFM technologies. There is need, therefore, to analyze interactions between different technology attributes and farmers' circumstances and how this influences choice of SFM technologies by small-scale farmers.

Smallholder farmers continue to experience declining per capita food production due to nutrient mining without adequate replenishment (Buresh *et al.* 1996). The problem is further aggravated by cultivation of vulnerable, low potential areas as population increases (Pieri 1989; Sanders *et al.* 1996). The African woman, who produces most of household food, therefore, faces conditions of difficulty and stress for which few real answers exist. While there are many technically sound recommendations for problems facing smallholders, most have ignored effects of gender in adoption decisions.

Although most farmers know the importance of replenishing lost soil fertility, only a few of them use fertilizers on a regular basis. Most use animal manure, compost and a variety of other low-external input technologies such as improved fallow (IF) and biomass transfer (BT). Women smallholders have no sufficient education, skills, control over land, and off-farm income. Food production achieved, therefore, is insufficient to adequately feed ever-increasing farming population. There is need then to increase land, labour and capital productivity through investments in gender-sensitive, profitable and sustainable technologies.

Integrated Soil Fertility Management (ISFM) Paradigm

The main cornerstone of ISFM approach is recognition of the importance of soil organic matter (SOM) in preservation of soil fertility and soil physical properties (Kauffman 1999). This is because water availability, plant nutrients and soil degradation are dependent on SOM content of soil (Kimani *et al.* 1999). Therefore, one of the goals of ISFM strategies should be to develop land-use and management practices, which will increase and maintain SOM content.

A whole range of soil amendments in combination with inorganic fertilizers has been tested in Kenya (Kimani *et al.* 1998; Kimani *et al.* 2000). They included use of crop residues, animal manure, compost and green manure cover crops (GMCCs). While average maize production was 1000 kg ha⁻¹, up to 6000 kg ha⁻¹ has been realised under various ISFM technologies (Breman 1997). This evidence pointed out the vital role soil amendments can play to increase food security, and hence farm incomes and rural welfare. However, introduction of such SFM technologies into farming systems has profound implications on their viability and profitability. Extra costs and/or benefits could be incurred or achieved. This determines their attractiveness or lack of it to male and female farmers and therefore has important implications on preference and viability of different technologies across the gender divide.

According to Breman (1997), ISFM approaches involved considerable investment. Such investments included labour for organic inputs, money for inorganic fertilizers, while GMCCs compete with crops for available land and take considerable time before their benefits could be fully realised. Women were constrained by labour drudgery, limited access to and control over land and capital. Considering that most households' chores are labour-intensive and performed by women, they would

therefore reject a profitable technology, if it were not labour saving. Therefore, there is need for analysis of various technology attributes and farmers' circumstance to enhance adoption and profitability of ISFM technologies in order to exploit their full potential.

Engendering Low-External Input SFM Technologies in Kenya

Efforts to overcome declining soil fertility on smallholder farms in Kenya are consistent with the reality of low utilization of inorganic fertilizers (Gachengo *et al.* 1999). Similarly, organic inputs alone cannot supply adequate nutrients. This paves the way for an integrated, low-external input approach to SFM.

Jama *et al.* (1999) also established that improved fallows (IF) are economical and have high returns to labour. Biomass Transfer (BT) and IF systems can therefore be as effective, in supplying Nitrogen, Phosphorous and Potassium (NPK) to maize as commercial fertilizers. The study further established that, these systems were profitable in terms of return to land and capital. These are interesting findings given that small-scale farming systems in Kenya are characterized by high population densities, 40 percent of households are female-headed and land parcels are less than 0.8 hectares (Shepherd and Soule 1998). However, these technologies need to be analyzed for gender sensitivity and efforts made to make them more gender responsive.

Also, their technical and financial performance varies across spatial locations and gender divide. Due to poverty and pressure to fulfil daily household needs, women tend to prioritize on short-term practical strategies than strategic needs as demanded by some SFM technologies (Flintan 2003). This tend to conflict directly with conservation and environmental objectives that are more long-term in nature. There is need, therefore, to evaluate different SFM technologies' feasibility and acceptability under different spatial, gender and socio-economic conditions of smallholder farmers in central Kenya.

Gender, Choice and Profitability of SFM Technologies

Kenya has had a long history of successful research and subsequent release of new varieties and technologies. Despite this, the country continues to suffer from food deficits in main food staples such as maize, wheat and rice (KARI 1998). Levels of technology adoption are low and farmers' yields are about 50 percent or less of the potential.

It has also been widely recognised that farmers' needs and objectives are diverse and always changing. However, these diversities have not been adequately considered during technology development processes. For example, much work has been done on manure use, management and potential by small-scale farmers in central Kenya (Lekasi 1998; Lekasi 2000). Limited studies though have been carried out on costs, benefits and effects of gender diversity on utility and viability of these technologies.

Other socio-economic factors such as land size, input requirements, off-farm income opportunities, skills requirements, and labour availability and producer prices could not be taken for granted. There is need therefore to understand farmers' production circumstances and explore profitability of such SFM opportunities across gender divide.

Women are key providers of labour in agriculture but are constrained by a number of socio-economic factors. They contribute about 80 percent of labour to food crop production, 50 percent to cash crop production but receive only 7 percent of extension information (World Bank 1994). They also play lesser role in male-dominated, decision-making institutions, networks of power and authority. In general women are less frequently consulted in technology development and transfer than men. Therefore, gender becomes a very important variable in research and development contexts. Gender relations are not universal but are dynamic over time and space. Also households are not uniform decision-making units; all the same represent complex interactions of individual interests, abilities and priorities of different male and female household members. Women and men have different life experiences, knowledge, perspectives and priorities. Their access to and control over resources and benefits are usually not equal. Men cannot necessarily represent the interests of women and vice versa; and neither of the two alone can adequately represent their community. Research managers, therefore, need to address gender issues in research priority setting and extension of new technologies. This would ensure that choices made take into consideration the diversity of clients' needs which in turn will serve as pillars of success in increasing agricultural productivity and production in Kenya.

In the last two decades, women have been recognized as the key actors in food production chains. They often contribute more to agriculture and household food production than men. It has also been acknowledged that women contribute more working hours in agriculture, yet they are structurally disadvantaged in access to and control over productive resources and benefits. In Kenya, it is estimated that women provided about 75 percent of all agricultural workforce (World Bank 1994). Besides this fact, women are increasingly assuming roles of managers and heads of households due to migration of men to urban centres in search of non-farm incomes. Currently, women manage and head about 40 percent of all smallholder farms (World Bank 1990). Despite their enormous contribution to agricultural and food production, very little is understood of their decisions on whether or not to use available technologies (Kimenye 1997). Women tend to be involved more in subsistence farming with limited use of improved technologies. Consequently their productivity tends to be below that of their male counterparts. In Kenya for example women productivity is 20 percent below that of men (Saito 1994). Also different gender categories (men, women and youth) have different needs and priorities in accordance with their different roles. Ignorance of such inequalities has resulted in low adoption of modern technologies leading to low *per capita* food production, land degradation and soil fertility depletion.

The low uptake of soil fertility management (SFM) technologies implies that soils suffer from chronic nutrient imbalances (Sanchez *et al.* 1996). Although technical and biophysical aspects of soil fertility decline are well known and have been widely documented in Kenya, little is understood about socio-economic, cultural and environmental factors influencing farmers' SFM technologies choices. Technologies are, therefore, formulated amidst information gaps on farmers' preferences, accessibility and profitability of such technologies. The problem of low adoption has also been exacerbated by liberalisation of country's economy. This poses grave challenges to food security, agriculture and NRM. Despite three decades of substantial technology development, workable solutions to problems of low farm production and profitability remain substantially elusive. Recognition of gender as a significant socio-economic variable in technology development and transfer has since become paramount. There is need, therefore, for mainstreaming gender analysis in NRM research in order to highlight gender roles and inequalities in access to and control over resources and how this affects adoption and profitability of different SFM technologies.

OBJECTIVE AND STUDY AREA

It is hoped that the research findings will lead to better targeting of policies and programmes considering farmers' this inequalities to effectively combat nutrient depletion, increase food security, reduce poverty and improve rural livelihoods. The aim of the study was therefore in line with Kenya's development policies as outlined in Poverty Reduction Strategy Paper (GoK 1994, 1995, 1996, 2001).

The major objective of study was to determine major attributes of small-scale soil fertility management (SFM) technologies, evaluation of farmers' characteristics including social and gender diversities, and how these influenced choice and profitability of SFM technologies for low-income farmers in maize-based production systems of central Kenya.

Specific objectives of the study included (i) to identify and evaluate socio-economic characteristics including gender that influence choice of SFM technologies in small-scale, maize-based production systems in central Kenya; (ii) to analyze agronomic and economic attributes of different low-external SFM technologies appropriate to particular smallholder socio-economic and biophysical circumstances; and (iii) to determine gender's influence on profitability of various SFM practices for different social classes of small-scale maize growers..

The study was carried out in three districts of central Kenya, namely Kiambu, Maragwa and Kirinyaga. Kiambu district has a total area of 1448 km² and an absolute poverty level of 25 percent. The district is heavily populated with population density of 562 persons per km² and average farm size of 0.58 hectares. The district has four major Agro-ecological Zones (AEZ), comprising Upper Highlands (UH), Lower Highlands (LH), Upper Midlands (UM) and Lower Midlands (LM), while major

enterprises include maize and beans, potatoes and pyrethrum, horticulture and fruits, tea and coffee, dairy and poultry.

Maragwa district covers approximately an area of 1065 km² with population density of 488 persons per km² and an average farm size of 0.93 hectares (GoK 1996). Absolute poverty level was 37percent in 1997. The district has four main AEZ, LH1, UM1, UM2, and UM3, and the major enterprises include Tea, maize-beans, dairy, horticulture and coffee.

Kirinyaga has an area of 1437 km² and a density of 318 people per km² and an average farm size of 1.25 ha per family. Absolute poverty in the district is about 35.7 percent. Major AEZ includes UHO, LH1, UM, and LM3, while major enterprises include maize-bean, tomatoes, French beans and bananas.

The targeted study districts are representative of the entire central Highlands of Kenya in many respects. The population densities are high, land fragmentation is widespread, women and children provide greatest the proportion of farm labour, and soils are poor and intensively cultivated. Less than 60 percent of the expected crop and livestock output is realised (MOA 2000) every year.

M ETHODOLOGY

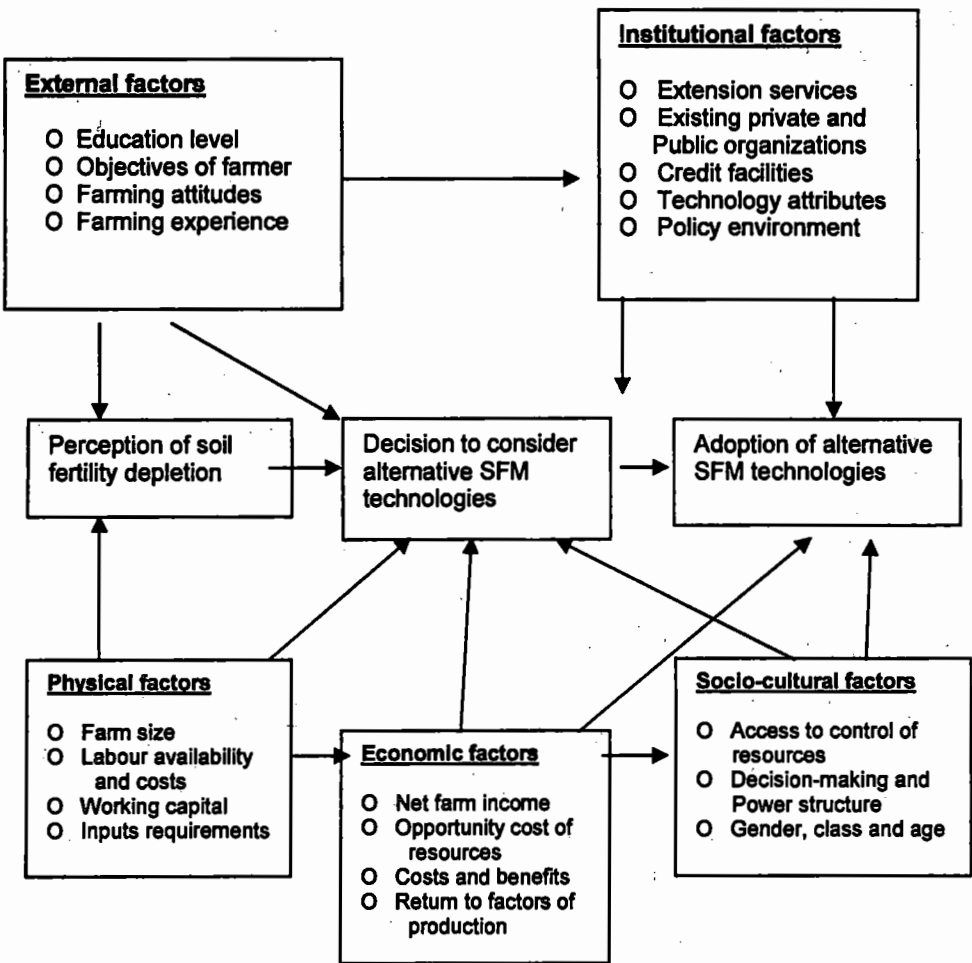
Scope of the Study

This study focused on smallholder farming activities in Kiambu, Maragwa and Kirinyaga districts of Central Province; these are highly populated districts of central Kenya where maize is the most important staple. Soils are depleted and agriculture is the mainstay activity for household food supply and other necessities. Data on a random sample of 102 households was collected and analysed on various attributes of different SFM technologies, farmers' socio-economic characteristics including gender and wealth status, and how these affect choice and profitability of various SFM technologies.

Conceptual Framework

There are various factors that may either enhance or restrict farmers' adoption of SFM technologies (Figure 1). These include personal, physical, institutional, socio-economic and cultural factors. Improvement in SFM would imply increased crop yields, farm incomes and farmers' welfare. Such conceived benefits can only be fully achieved if various SFM options available to farmers are adequately explored under different social and gender contexts. Farm resources are scarce and have many alternative uses. Male and female farmers are therefore likely to choose only those technologies, which best suit their own needs under given socio-economic circumstances. There is thus an automatic need of choice, which can only be effectively made once underlying factors are clearly understood.

Figure 1. Conceptual Model of farmer's choice decision.



Methods of Data Analysis

Gender Analysis Framework (GAF)

Gender analysis (GA) is an organised approach aimed at understanding how men and women relate to each other in terms of roles and responsibilities, access to and control of resources and benefits in a given community (Pasteur 2002); also includes what men and women, boys and girls do, locations and patterns of mobility, their daily and seasonal patterns. It requires separating data and information by gender and age, the so-called gender disaggregated data. GA is therefore important at all stages of any research and development (R&D) process.

Gender Analysis Framework (GAF) included assessment of livelihoods assets, power and decision-making processes. Also practical and strategic needs of men and women, priorities and perspectives were explored. GA tools such as social and resource mapping, daily and seasonal calendars, economic well-being ranking and mobility mapping were used. This helped in analysis of opinions of different gender groups with regards to costs and benefits of various SFM technologies. It was therefore important to involve target groups in planning, monitoring and evaluation of research activities in order to analyze their impact on women, men, boys and girls.

Gender Analysis Framework (GAF) was used to explain observed differences in behaviour between genders in terms of unseen underlying attitudes and social contexts. This was done through separate meetings with either gender in times and localities that were appropriate to them and through personal interviews and focus group discussions. Division of people on the basis of social classes, ethnicity, age groups and family composition was, therefore, made.

Primary data was collected by use of a structured questionnaire from 32 randomly selected farmers in each study site. Gross margins (GM) per hectare, man-hour of labour and shilling of working capital were computed for different genders in different farm typologies.

FINDINGS AND DISCUSSION

Social and Gender Analysis

Agriculture is the backbone of Kenya's economy. The status and stability of this sector determines the economic growth, which entails poverty eradication, food security and improved livelihoods. Gender equality or disparity plays a major role in the economic growth; and this calls for understanding of who holds or plays key roles in agricultural sector. In a traditional farming set-up, a woman spends much of her time in a farm that she may or may not own or have control over, and more often than no; she may not have a say in the accruing benefits as well as in the development activities of that land. The present research gave focus to identification and evaluation of socio-economic characteristics including gender that may influence choice of SFM

technologies in maize-based production systems for smallholder sector development in central Kenya.

Categories of households

One hundred and two female and male-headed households were interviewed in Kiambu, Maragwa and Kirinyaga Districts. Females comprised 53 percent, while males comprised 47 percent; these were not necessarily household heads. In Kiambu, 60 percent of those interviewed were males; while 40 percent were females; in Kirinyaga, 49 percent were females while 51 percent were males; and in Maragwa, 69 percent were females while 31 percent were males. In general, of those who responded, 53 percent were females and 47 percent males; this gives a ratio nearly of 1:1 male to female. It was established that household head was the main decision maker, he/she decided what to grow, what SFM technology to adopt, when to get a loan, or the type of development to be initiated. Male-headed households differed in development initiatives and innovations from those of female headed ones. In Kiambu and Maragwa female headed and male headed households represented 17 percent and 83 percent and 38 percent and 62 percent, respectively.

In general, of those interviewed, female-headed households represented 24 percent; while male-headed households represented 76 percent. This indicated the need to identify the critical gender in decision-making processes, as this would determine adoption rate of SFM technologies

Farmers' Education and Age

It was established that education level of the household heads was an important factor in development initiations, adoption of new farming technologies and changes in farming enterprises. In Kiambu, 97 percent had at least attained basic primary education, 3 percent had tertiary education while 3 percent had no basic primary education. This was an indication of high literacy level in the district. In Kirinyaga, about 91 percent had at least basic primary education, 6 had tertiary education while about 9 percent did not have basic primary education. In Maragwa, 69 percent had attained at least basic primary education, with 9 percent attaining tertiary education but 31 percent had no basic primary education. A general overview across the districts showed that 86 percent had attained at least basic primary education, 6 percent had tertiary education while 14 percent had no basic primary education.

Age of a farmer was a very important factor in development, information dissemination and adoption of new technologies. Young and energetic farmers were more dynamic in adopting new SFM technologies and tended to engage in enterprises, which were market oriented and more profitable; they were more interactive, more knowledgeable and more skilled. In Kiambu, many (26 percent) of the farmers were aged between 51-60 years of age, in Kirinyaga 23 percent were aged between 46-50 years; in Maragwa still higher proportion (34 percent) were aged between 51-60 years. In general, many (26 percent) of the farmers were aged between 51-60 years. Old

farmers were more risk-averse and would be hesitant to adopt new SFM technologies despite the latter's higher productivity and profitability.

Occupation of the farmer

In Kiambu, 89 percent were farmers with no other formal employment and 11 percent in self-employed and or engaged in informal employment. In Maragwa, 81 percent had no other formal or informal employment, 13 percent were self-employed, while 6 percent had formal employment other than agriculture. In Kirinyaga, 77 percent had no other employment except farming, 9 percent were retired civil servants, 9 percent working civil servants and 3 percent were self employed. In general 85 percent were farmers with no other employments, 5 percent civil servants and 10 percent were self-employed. Full time farmers are more likely than not to adopt new SFM technologies, as they would be very interested in increasing and sustaining their farms' production.

Type of household

There were 6 different types of households in the study area. The greatest category was male-headed and married (72.5 percent), while the female-headed households comprised only 10.8 percent of the total.

In Kiambu, although 89 percent were farmers, it was only 26 percent who were food self-sufficient and did not purchase food; while 34 percent produced up to 75 percent own need and bought remaining 25 percent. Of the rest 10 percent and 20 percent produced 50 percent and 25 percent of their requirements, respectively.

Only 9 percent depended entirely on purchased food. In Kirinyaga, 40 percent of the farmers had sufficient food and hence had no need for no purchase, 40 percent purchase 25 percent but produced own 75 percent, 17 percent purchased as much as they produced, while 3 percent purchased 75 percent of household food and produced only 25 percent. None of the farmers depended entirely on purchased food.

Similarly, in the other two districts, none of the households has enough food but still none relied totally on purchased food either. The responsibility of purchase of additional food requirements fell on wives; other members of the household were rarely engaged in food grain purchase.

There was a whole range of dependency on purchased food to supplement own produce. This pointed out to the need for smallholders in the study site to adopt higher yielding SFM technology that would ensure that all household food requirements were met from on-farm production.

Water sources

The source of domestic water was a very important aspect in all households. In Kiambu, 74 percent had access to tap water, while the rest 6 percent had access to river water and 3 percent borehole (BH) and rivers. In Kirinyaga, only 6 percent had access to tap and BH water, while 89 percent depended on water from rivers and

wells. Eighty nine percent of all the farmers interviewed do not have access to clean and safe domestic water. In Maragwa, the great majority (94 percent) collect their domestic and livestock water from rivers and wells; only 3 percent can access BH water. This translates to 94 percent households who do not have access to safe and clean drinking water. Different means of collecting water were used by the farmers depending on the distance to water sources and the time required for fetching water from the source.

At least three trips each for livestock and domestic use were required for daily water requirement. In Kirinyaga, despite few farmers (<10 percent) who have access to tap water, most farmers have to walk up to 4 Km in search for water source, mainly unsafe river water. A general overview showed that, the farmers had to walk up to 4 Km to fetch water, and took at times up to 2 hours to make a single trip and some made up to 10 trips to have enough water. On average, it took 46 minutes for one trip to collect domestic water from an average distance of 1.04 kilometres; and approximately 3 trips per day to collect enough water for household use on daily basis.

In Kiambu, mainly boys and girls were responsible for attending to domestic water needs; often boys more so than girls; women also participated in such chores. Depending on the distance to water source and availability of resources, farmers use different means to collect their domestic and livestock water. In Kiambu, due to proximity of water within their compounds, the farmers only hand ferry the water to their houses and livestock sheds but 39 percent use drudgery to collect domestic and livestock water.

Water availability, time used for collection, quality and gender involved were critical in determining the amount of family labour that would be available to work on farms. Farmers, especially women farmers, would be hesitant to adopt labour intensive soil fertility management technologies despite their higher productivity; because of their commitment to domestic chores.

Household Income Sources and Expenditure

In Kiambu, the main on-farm income earner was maize (30 percent), followed by beans (15 percent) and dairy (13 percent). There was, however, a gradual shifting from maize cultivation to dairy farming and horticultural crop production (high value crops like tomatoes).

A nutrient monitoring survey carried out within the same locality also showed that there was decreasing land sizes under maize cultivation. This has also led to decreasing land for grazing, hence the prevalence of zero-grazing (Dairy) and cultivation of high value crops. In Kirinyaga, the leading on-farm income earner was maize (26 percent), followed by beans (21 percent), then bananas (14 percent) and tomatoes (12 percent) of total on-farm income. In Maragwa, maize was the main (25

percent) on-farm income earner for the households although it contributed only a quarter of the total on-farm income. The on-farm income seems to be distributed among five main on-farm income contributors viz: maize, beans, milk, bananas and coffee, 25 percent, 22 percent, 16 percent, 12 percent and 12 percent, respectively. In general, maize was the leading on-farm income earner (30 percent) followed by beans (15 percent) and then milk (13 percent). This showed the need for adoption of improved SFM technologies that would enhance production of maize as the main income on-farm earner. The main source of off-farm income was casual labour (19 percent).

In Kiambu, main on-farm income earners were wives who earned as much as 61 percent of the on-farm income. Husbands earned almost half of what the wife earned (31 %). Similarly in Kirinyaga, wives were the main earners of on-farm income (60 percent), while the husbands earned 39 percent. In Maragwa, husbands and wives jointly earned 41 percent, while wives alone earned 24 percent of the total on-farm income. A general overview shows that wives were the main on-farm income earners.

Off-farm income did not contribute much to the families interviewed but 14 percent of the families depended solemnly on off-farm income for day-to-day upkeep of their households. The main off-farm activities were casual labour as well as self-employment; casual labour being more dominant. The husband was the main off-farm income earner in both Kiambu and Maragwa; more so in Kiambu than Maragwa, followed by children while contribution of wives was minimal.

Gender Labour Profile

In Kiambu, women spend higher number of hours (31) in the farm as compared to men (19 hours per day). In Kirinyaga, men spend more time (mean 6 hours) in land preparation than women (mean 2 hours), while women spend more (mean 7 hours) time in planting than men (mean 4 hours).

In Maragwa, men and women spend more or less equal time in land preparation and planting but women spend more time in weeding (mean 5.4 hours) than men (mean 4 hours). Men were not usually engaged in harvesting; while women spend an average of 5 day hours in harvesting during the harvesting seasons. In general men spend more hours in land preparation (5.1 hours per day during the season) while at the same time, women spend an average of 3.5 hours in land preparation. It was primarily females that were involved in maize production, i.e. in planting, weeding, harvesting and shelling. In Kirinyaga, males dominated land preparation (94 percent) and attending field days and demonstrations, while female dominated maize planting, weeding and shelling; 86 percent, 71 percent and 83 percent, respectively. Farmers strongly expressed their desire to share all farming activities equally by male and female members of the household.

Gross Margin Analysis (GMA)

Gross margins (GM) per hectare, man-hour of labour and working capital (shilling) were computed for maize-bean enterprise to determine profitability across different genders and SFM classes or farm typologies. Division of enterprises' GM by their labour requirements and total variable costs per hectare derived GM per man-hour and GM per shilling of working capital respectively. The GMs were computed from primary data captured in a structured questionnaire. Farmers in different socio-economic circumstances must invest their scarce farm resources in the most profitable SFM technologies. From farm surveys undertaken, the amount of land, labour and working capital availability for maize-bean enterprise in three soil fertility management (SFM)-based typologies were determined. The typologies comprised Class I, Class II, and Class III, respectively, and nutrient levels, land, labour and working capital availability in different farm typologies in all study districts were compared.

It was noted that land was the most limiting farm resource, and should be allocated to SFM technologies that guarantee the highest returns. Although maize-bean intercrop took most land in every class and site, it did not give the highest GM/ha showing that the existing SFM technologies were sub optimal. Returns per unit resource invested from some farm typologies were negative. It was also established that due to differences in access to and control of resource, there were significant differences in GMs for female and male-headed households.

It was established that it is more economical and sustainable to meet household food requirements from on-farm production. Smallholders are risk averse and tend to prefer SFM technologies that would safeguard domestic food self-sufficiency before embarking on production for marketing purposes. Technology change is inevitable in adoption of superior SFM technologies to boost household food production and farm incomes. Adoption of new SFM technologies meant extra benefits and costs. Both female and male farmers were therefore concerned with returns per unit land, labour and working capital invested in such technologies.

Predominantly wives decided on choice of maize varieties. All socio-economic factors revolving around choice of improved maize varieties were critical in that adoption of improved SFM technologies alone would not guarantee household food security, unless combined with adoption of high yielding, early maturing and disease resistant maize varieties.

General Observations/Findings

The importance of maize as the main food staple in Kenya cannot be over emphasized. Over 80 percent of all maize growers are the smallholder farmers who are constrained by scarcity of production resources (GoK 2002). The research undertaking aimed at understanding how declining land, labour and working capital

availability and productivity have affected food output, incomes and livelihoods of female and male smallholder in the central Kenyan Highlands. It aimed at determining major objective of study was to determine major attributes of small-scale soil fertility management (SFM) technologies, evaluation of farmers' characteristics including social and gender diversities and how these influenced choice and profitability of SFM technologies for low-income farmers in maize-based production systems of central Kenya.

The major problem in the smallholder farming systems has been escalating food insecurity, malnutrition and poverty. About 56 percent of the Kenyan population live below the poverty line (< USD 1), 80 percent of who live in rural areas, majority of who are women. One major cause for this problem is enhanced population growth that outstripped available land. This has led to land subdivision and intensive cultivation without adequate soil fertility management (SFM). Escalating prices of inorganic fertilizers on the other hand, have exacerbated the situation especially after the collapse of farm support programs in the 1990's. Resource-poor smallholders have therefore resorted to low-external input SFM technologies, the so-called 'organic input' paradigm. However, adoption and profitability of such technologies have been constrained by ignorance of farmers' gender, social and economic diversities during many technology development processes. The consequences have been further plant nutrient depletion, land degradation and decline in *per capita* food production in smallholder agro-ecosystems.

CONCLUSIONS

Evaluation of smallholders' characteristics

From the key study findings, the following conclusions were drawn:

Participatory Learning and Action Research (PLAR) analysis model could be successfully applied to delineate female and male smallholders' farm typologies along inter-class SFM gradients and resource endowment status. In this study, all female and male farmers in the study area were classified into three SFM-based classes (Class I, II and III). Such characterisation enabled farmers and stakeholders to participate equally in derivation of class-specific SFM problems, coping strategies and opportunities depending on farmers' socio-economic circumstances. This approach could enhance adoption of appropriate SFM technologies across the gender divide leading to increased productivity and profitability of smallholders' agro-ecosystems.

Once characterisation of farmers based on their SFM status was accomplished, on-farm experimentation and evaluation of 15 SFM technologies commenced. This paved the way for participatory technology development (PTD) in demonstrating and packaging of SFM strategies that were appropriate to specific farmers' cultural and socio-economic circumstances in each study site. Adoption of such technologies could

lead to efficient use of scarce farm resources by different genders leading to enhanced food security, income and smallholders' welfare.

Evaluation of SFM technologies

Before economic analysis of viable SFM technologies could be done, it was necessary that relative agronomic evaluation (RAE) of biophysical data from different treatments be undertaken. This way, the optimum Manure + inorganic fertilizer (Kg N/ha) levels that gave the highest yields per hectare was determined. From RAE, it was clear that on application of increasing levels of any input, there was a corresponding incremental rise in crop yields.

Decision based on biophysical data alone cannot be conclusive enough until costs of added elements are considered and the accruing benefits analyzed the so-called economic analysis. From partial budgets, it was observed that treatments with the highest yields were not necessarily the most economical. Farmers were also interested to know the extra costs and benefits involved in adopting a new technology.

Adoption of SFM technologies depended on farmers conceived benefits over the extra costs accrued from such technologies. From farm surveys conducted in Maragwa and Kirinyaga Districts, it was established that over 99 per cent of all smallholders used organic and inorganic nutrient sources at one level or another. From literature search, evidences showed overwhelming potential of low-external input SFM technologies in reduction of smallholders' food poverty, improvement of farm incomes and livelihoods. Yet no evidence of appropriate legislation promoting use of organic resources was found. There is need; therefore, for some policy support towards use of organic materials by low-income smallholders who form over 80 per cent of Kenya's farming community majority of who are women.

Profit Analysis

The analysis indicated that:

- Land was the most limiting farm resource in smallholder maize-based production systems, followed by labour and working capital respectively. For profit maximization objective, all land should be allocated to the SFM technologies that give the highest return per hectare for different gender. This is especially so for women farmers who have limited control.
- Family labour was the second most limiting resource after land. Opportunity cost (OC) of family labour in smallholder farming systems cannot be ignored. Returns to family labour increased as one moved down the SFM-based farm typologies. These results indicated that OC of family labour should be taken as "real" cost and always be included in economic analysis of any smallholder production system. Labour saving SFM technologies should be promoted especially to reduce drudgery on women due to their other reproductive and productive roles in the society

- It would be more profitable for farmers in all farm typologies to adopt improved Manure + Fertilizer technologies in varying levels. This would provide an integrated SFM approach to combating nutrient depletion depending on farmers' gender, biophysical and socio-economic circumstances. This would ensure that all household food requirements were met in a sustainable manner from on-farm production

RECOMMENDATIONS

Based on the study results, the following recommendations were formulated:

In Kiambu, both men and women had access and control over all the household assets but men had more access and control over land and family labour than women. Adoption of SFM technologies would imply investing more in land, labour and working capital. Women have been found to be the main farm operators yet have least say in use of farm resources. Furthermore, they have even lesser say in benefits accruing from investment of their time in the farm enterprises. What the above analysis suggests is that women access to and control of productive resources and benefits should be further strengthened in all study districts to enable them undertake SFM technologies that require more investment of these resources. Policies also need to be enacted to strengthen increased say of women in land matters such as land registration and inheritance. Such a move would enhance and sustain productivity and profitability of smallholder farming systems especially in female-headed households.

It was established in this study that SFM status of smallholders depend on their wealth endowment; 70 and 66 percent of all farmers in Maragwa and Kirinyaga, respectively, were classified as poor in terms of resource endowment. These farmers cannot afford high external-input SFM technologies as advocated in blanket fertilizer recommendations. Adoption of low-input, high-output SFM technologies by resource-poor female and male smallholders in central Kenyan Highlands should therefore be actively promoted.

In this study, Manure (5 ton/ha) + Fertilizer (20 – 60 kg N/ha) proved successful in enhancing production and profitability in the three SFM-based farm typologies. Research-extension linkages should be strengthened in order to play their technology development and transfer roles more effectively while taking gender diversity into consideration. The ill disposed smallholder agro-ecosystems in study sites could be revitalized from low-input low-output systems, better known for hunger, malnutrition and poverty, to low-input high-output, profitable systems.

More than 99 percent of all smallholders in Maragwa and Kirinyaga were found to use organic + inorganic resources at different levels for SFM. However, at present there are no legislations favouring mainstreaming organic resources in Kenya's agricultural sector. Such legislations would make organic resources more widely acceptable both at farm and all decision-making levels. There is also need for macro-policies that

would lower input prices and increase producer prices to encourage resource-poor farmers especially women to invest in soil as a capital resource.

Lack of affordable credit was a major impediment to intensified use of inorganic fertilizers in the central Kenyan Highlands. Women farmers were greatly constrained than their male counterparts and were therefore unable to undertake high-external input SFM technologies due to high initial investments. Consequently, the government should undertake policy and institutional reforms aimed at improving capacity of financial institutions to direct more resources to farming communities. Farmers' organisations (co-operatives), common interests groups (CIG), community based organisations (CBO) and non-governmental organisations (NGO), which could undertake participatory technology development (PTD), support rural savings and credit schemes and marketing should be facilitated and promoted.

Poor rural road infrastructures were cited as the major constraints in transport of farm produce and inputs especially during the rainy seasons. Gravelling and regular grading of rural access roads would facilitate affordable movement of products and inputs between production and consumption points. Lowering of transport costs could reduce the variable costs accruing from adoption of improved SFM technologies. Farmers will transport farm produce more affordably and in time to capture good prices offered in the local markets and beyond.

Markets are very crucial outlets of farm produce, source of inputs and provide an avenue of exchange for goods, services and information. Produce prices fluctuate very widely between season and off-season crops. The local authorities (LAs) should form "market user's organisations" to streamline market imperfections that promote price distortions and hinder free flow of market information. This could make marketing systems more efficient and responsive to farmers' needs and objectives. Such systems could promote well being of women farmers who undertake the bulk of production and marketing roles.

The number of risk-averse, small-scale farmers especially women who cannot afford costly inorganic fertilizers has increased tremendously. This has caused profound decline in soil fertility and shortfall in household food production. There is need therefore to review gender policies so as to integrate gender analysis in NRM research for enhanced adoption of SFM technologies in small-scale, maize-based production systems in central Kenya. Adoption of Manure (5 tons/ha) + Inorganic fertilizers (20 – 60 kg N/ha) would entail increased investment of land, labour and capital. Different genders have different access to and control over such resources. However, adoption of such technologies will increase profits for both men and women in smallholder farming systems justifying such investments.

The price most people are paying for irresponsible use of sex in the study districts is appalling. So is the cost of care for those affected and infected by HIV/AIDS especially in the most active age group (16 – 64 years), which formed over 63 percent

of the population in each study area. This has been translated into loss of labour, a very valuable resource in smallholder set-ups. Worst hit by this scourge have been women and the elderly who have to care for the infected and affected. Relevant and more reliable information about HIV/AIDS pandemic should be accompanied by guidance on how to manage sex more responsibly. Constituent's HIV/AIDS committees should be more innovative and play instrumental role in promoting education and information campaigns aimed at changing peoples' attitudes and behaviours. This is because healthy attitudes toward sex have been more difficult to acquire, yet substantial information about sex has been available.

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Chapter Four

Gender analysis on access, control and use of natural resources in Southern Malawi: The case of areas surrounding Lisungwi, Mwanza and Mmkulumadzi River

Chimwemwe Mawaya and Meya P. Kalindekaffe

INTRODUCTION

Background

Women's survival and that of their households and communities depends on access to and control of natural resources, which include water, land, forests and wildlife. Over generations women have developed in-depth knowledge and understanding of the uses and care of natural resources such that they have learned to manage these resources in order to preserve them (WEDO 2003). Despite this being the case, women's access to and control of these resources is far from being guaranteed. Over the years, the interest in natural resources and environment has not always included the concern for the role of different gender groups. Research has shown that agricultural productivity increases significantly when women farmers have access to and control over land resources. Apart from men, women and youth play important role in natural resource management because they are usually the ones involved in gathering and use of natural resources at household level as well as at community level. However, because of the pioneering accounts of the role of women in agriculture dating from the 1960s and 1970s, the importance of women in development has received increasing attention (Williams *et al.* 1994) though more action needs to be done. These gender groups are, therefore, in a better position to effectively contribute towards the assessment and determination of approaches to sustainable natural resource management for their own benefit and for the benefit of their communities.

However, women and youth remain largely absent at all levels of decision-making, project formulation and management of natural resources and the environment. If they are present e.g. in local-based committees, they usually are just committee members or secretaries to take minutes and rarely voice their concerns due to cultural, political and illiteracy barriers. Some of the factors that limit the involvement or participation of women in natural resource management in Malawi include: (i) lack of commitment by most governments agencies in implementation of gender and natural resource management - very few gender and natural resource management researchers and experts; (ii) very few numbers in influential, technical or management positions – an inventory conducted in 1999 by Kalindekaffe for the United Nations University

indicated that the majority of women that are involved in natural resource management are either extension workers or teachers; and (iii) inadequate networking and collaboration among government, researchers and other partners in development.

Women and other vulnerable groups are often not given the opportunity to access, control and manage these natural resources. Considering the fact that currently, the natural resources are scarcely available this scenario is more likely to worsen as conflicts arise on access to and control over these resources. Kweramba (2001) states that in southern Africa water management have been regarded as a male preserve, despite the fact that women utilize and manage most water resources at various levels of the society. Yet improvement of water services can only come about when women have a stake in all processes of water resources development so that their needs are met. Thus gender is one of the issues that the natural resource management sector should take seriously in the southern African region.

In addition to women being the main managers of natural resources and not having access to and control over natural resources, they are mostly the most affected (victims) by natural resource degradation because of the gender roles they play. If there is scarcity of water, forest products, and wildlife products, it is women who have to travel long distances in order to collect water, firewood for energy, and food products for the basic household needs, as the case may be. This means that they are robbed of time that they could allocate to other domestic and economic activities. One of the key issues that needs to be addressed by African countries is low participation of women in terms of access, control (decision-making structures; unequal power relations and limited control by women over basic resources) and management due to lack of opportunity and information about natural resources (United Nations Development Programme 2002).

In Malawi, gender inequality has currently been found to be one of the obstacles to achieving sustainable development; in March 2000 a National Gender Policy was formulated in order to mainstream gender into all development activities. According to the National Gender Policy, one of the areas in which gender disparities seem to exist is natural resource management. The overall objective of the gender policy in relation to natural resources is to promote the participation of women, men, girls and boys in the sound management, conservation and utilization of natural resources and the environment so as to achieve sustainable and equitable development. Other sectoral policies like the forestry policy also call for 'ensuring that the women's role in forest and tree resource utilization and management receives due attention'. Although the Malawi gender policy considers the issue of gender as being crucial in natural resource management for socio-economic development, natural resource management is not amongst its priority action areas.

RESEARCH PROBLEM, JUSTIFICATION AND OBJECTIVES

The Problem

Malawi is endowed with a diversity of natural resources that include fertile soils, forests, abundant water, diverse flora and fauna. The urban population in the country is around 14% (Malawi Government 2002) with the rest of the people living in rural areas. The people in rural areas rely on natural resources especially water, land and forestry resources for their livelihoods. Certain groups of the rural population, especially women and children, are the main direct users of natural resources, which if properly utilized, would provide a basis for sustainable socio-economic development and poverty reduction. However, the problem is that in terms of access, control and management of natural resources, there seems to be inequality among the different gender groups. This may have serious implications on the livelihoods of the disadvantaged gender groups. It is therefore important to assess how different gender groups access, control and use some of the key (e.g. land and forestry) natural resources in the country, if sustainable development is to be achieved.

In an attempt to address the above problem, the following questions were used to guide the research process; (i) what are factors that define gender roles and relations *vis a vis* land and forest resource management? (ii) do gender roles and relations affect access, control and use of land and forest resources at household and community level? (iii) do access, control and use of these resources affect the livelihoods of the different gender groups? (iv) what are the practical and strategic needs of different gender groups in relation to access, control and use of these natural resources?; and (v) how can the different gender groups be integrated into sustainable management of these natural resources based on their roles, relations and needs?

Research endeavours to date and gaps

Research related to gender in Malawi has been carried out especially in relation to priority areas such as violence and girl-child. Although the national gender policy says that it shall promote women, men, girls and boys in sound management, conservation and utilization of natural resources so as to achieve sustainable and equitable development, very little research has been done on gender and natural resource management. Although there is an ongoing project in the Department of Biology of the University of Malawi, on water resources management in southern Malawi that is assessing the role of gender in water resources management, it was discovered that there was urgent need to also look at other essential natural resources (land, forest) that are closely related to water resources, in the area in relation to gender (Department of Biology 2003). The present research project is therefore an additional component of an already ongoing research project that is being implemented to address gaps in gender analysis in natural resource management.

Importance/justification

In Malawi, there are inequalities amongst various gender groups in terms of access, control and management of natural resources. According to the Malawi National Gender Policy of 2000-2005 (the Republic of Malawi 2000), a critical analysis of the Malawi society shows that there are strong traditional and cultural forces that bring about disparities between men and women in actual power sharing, participation and control over decision making processes. These favour men and put women in subordinate positions. For example in the agricultural sector, studies show that about 70% of full-time farmers are women. Both in matrilineal and patrilineal societies most women do not take full control over the use and ownership of land resources. Women's access to credit is still low at between 10 to 15% while that of men ranges between 45-55%. Gender disparities highlighted above, have limited women's participation in and benefiting from natural resource management and development activities.

The government of Malawi has developed and is implementing the Poverty Alleviation Program (PAP) with the overall objective of transforming the economic structures to ensure that the economic infrastructure contributes positively towards raising the living standards. This is expected to result in improvement of people's access to basic needs and services such as food, shelter, health services, safe water, education and employment. This development will invariably continue to depend on the environment through utilization of natural resources such as land, water, forests, wildlife, fisheries energy, and minerals. Since most people rely on natural resources for their livelihood in Malawi, an understanding of the actual access, control and use of the key resources would thus provide a basis for sustainable socio-economic development of the area and the country. The research therefore related well to this development priority of Malawi in the sense that it will provide gender-disaggregated data on which natural resource development activities can be based.

Objective

The general objective was to examine and establish ways on how gender can be mainstreamed into natural resource management in terms of access, control and management, for sustainable livelihoods of different gender groups in the study area. The specific objectives include (i) to determine factors that define gender roles and relations in relation to natural resource management; (ii) to find out how gender roles and relations affect access, control and use of land and forest resources at household and community level; (iii) to determine how access, control and use of these resources affect the livelihoods of the different gender groups; (iv) to identify practical and strategic needs of different gender groups in relation to access, control and use of these natural resources; (v) to come up with ways of how the different gender groups can be integrated into sustainable management of the natural resources based on their roles, relations and needs; and (vi) to build local capacity on how gender

issues/considerations can be mainstreamed into local natural resource management and development activities.

Conceptual and Theoretical Framework

Gender refers to social differences as opposed to biological ones, between women and men that have been learnt and are changeable over time. Gender is a dynamic concept in which gender roles for women and men vary greatly from one culture to another and one group to another within the same culture. The social construction of differentiated gender roles has profound implications for women and men in relation to sharing the world's resources and benefits. Class, sex, age, literacy level and economic circumstances are variables that may influence what is considered appropriate for women and men. Gender analysis helps us to understand gender differentiation and gender discrimination. Access to resources and benefits and control over them is allocated according to gender in both obvious and subtle ways. In some societies for example women may own land but their access to it for growing food may depend on a male relative or husband; in other societies they may not own land at all. In this research class, sex, age, literacy level and income levels are explanatory variables, which will be related to dependent variables, which are access, control and use of resources.

METHODOLOGY

Choice of Study Area

The research was carried out in areas around three rivers; Lisungwi, Mwanza and Mkulumadzi. Unlike other rivers that are found in Malawi, no gender information on areas surrounding these rivers in relation to gender and natural resource management is available. Women also constitute a higher percentage of the population in these areas, thus making them suitable areas for collecting gender-disaggregated data. Interest in these rivers is also based on the fact that they are important tributaries of the Shire River, which is the main source of hydroelectric power in Malawi. These rivers pass areas of various degrees of environmental degradation resulting mainly from human activities. The rural location of the study area implies that livelihoods heavily rely on natural resources exploitation.

Reconnaissance Visit

A reconnaissance visit was made to the study area to inform the people of the proposed project and also to pre-test the questionnaires and train research assistants at the beginning of the research project. Also during this visit, arrangements were made on how best to administer focus group discussions, questionnaires, resource mapping and benefit analysis charts. After the reconnaissance trip the questionnaire was revised and several questions were revised and rephrased and also some questions were moved to focus group discussions questions in order to shorten the questionnaire and thus reduce time taken in administering the questionnaire.

Sampling

Each of the rivers was divided into three parts representing the upper, middle and lower sections. Questionnaires were administered for each river with at least ten in each section in randomly selected villages. At least three focus group discussions were randomly conducted for each river. The focus groups comprised of three subgroups of women, men and traditional leaders (key informant interview).⁴ Some areas that the researchers would have liked to include in the sample were not accessible and this might have biased the sampling process especially for Mkulumadzi River because the researchers failed to reach the prescribed 30 questionnaires per river target

Research and Instruments

In order to achieve the objectives set in this research project, and to better understand the gender issues in relation to natural resource management, the study used a number of methods to collect data. These included questionnaires, focus group discussions, resource maps and benefit analysis charts. In addition to these, direct observations and document analysis of available literature on gender and natural resource management were used as additional instruments. All these provided gender-disaggregated data on division of labour, economic factors, use access and control over resources and their impacts on livelihoods of different gender groups; lastly, on cultural knowledge and practice in relation to resource management.

Administration of the questionnaire

A total of 141 questionnaires were administered in areas surrounding the three rivers. These questionnaires were administered in 23 villages namely, Kang'ombe, Mdzala, Kanselu, Mathotho, Lembani, Faiti, Chilala, Mkundika, Kasamba, Fusani, Kasinje, Chilumphu, Sayenda, Sitola, Chimbwindu, Faiti, Dickisoni, Chagoma, Mulongolola, Epesi, Zidala, Mposadala and Feremu in Traditional Authorities Chapananga, Kanduku, Symon Nthache, Mlauli, Dambe and Phambala.

Mwanza and Lisungwi had more respondents than Mkulumadzi due to high population densities in the areas surrounding these two rivers. These areas were also easily accessible by good roads than the villages in areas surrounding Mkulumadzi River.

Focus group discussions

Focus group discussions (FGDs) comprised of open-ended and semi-structured conversations with smaller groups. A total of nine focus group discussions were carried out for all three rivers. On each site, two focus group discussions made up of

⁴ Traditional leaders were chosen as key informants because they are usually the custodians of traditional knowledge and the fact that they are usually in contact with the people; they were thus more likely to know gender relations in their areas of jurisdiction rather than government officials who may be strangers to cultural traditions in the area.

men only and women only were conducted, with each group having at least twelve people and not more than 20 people. In addition, one key informant focus discussion group was conducted per river made up of traditional leaders. The advantage of conducting separate focus group discussions for men and women was that it allowed participation and contributions by the different interest groups who may not have shared freely their views and concerns in the presence of members of other groups because of customs and traditional beliefs. For example, in certain societies women are not allowed to speak when men are speaking.

Benefit Analysis Chart

Benefit analysis charts allowed for in-depth examination and analysis of who uses and benefits from particular resources as it was done with the use and information support from resource maps. Benefits analysis charts gave useful data on who actually gets benefits from the different resources despite access, control and use. Researchers explored why women and men use the natural resources they use (i.e. the benefits they receive from particular natural resources) by examining the attributes that women and men ascribe to different resources (nutrition, medicinal use and so on). The analysis also explored who holds traditional knowledge and who commonly sells which resources to local/regional markets. Men and women did their benefit analysis charts separately.

Resource Maps

Resource maps were drawn in three villages. These are Chimbwinda, Zidala and Mathotho villages. Resource maps were drawn by the same members who did benefit analysis charts in order to examine the different resources used by women, men and other gender groups and the personal and use value that women and men attach to such resources. Mapping of gendered resources was done with small gender-based groups of twelve. The purpose of the exercise was twofold: (i) to map out resources which are thought to be associated with dominant socio-cultural categories of "women" and "men"; and (ii) to map out spaces used by individual gender groups. This will enable the research to draw out contradictions between local ideology about gender roles and gender spaces (i.e. what should be) and daily gendered practice (i.e. what is).

To begin the exercise, researchers assembled two groups of 12 people, one group of women and one group of men including both young and old people. Of the men group, each was asked to map out the spaces, places, and resources used by women and men, and each group of women was asked to map out the spaces, places, and resources used by men and women using different colours, codes or symbols. This exercise revealed local social ideals regarding gender roles and use of spaces and resources. The researchers also examined gender roles and use of space as it happens in everyday life.

The researchers then asked the participant to point out, and comment upon, key places, features (such as their home or nearby road), structures, and resources important to them. The participants were then being asked to identify and draw key places/spaces that are essential (or peripheral) to their daily activities, and places/spaces which they perceive to be important to "men"/"women" and to themselves personally. The participants were not to be interrupted unless they stopped drawing, in which case questions were asked to prompt the participant.

During map drawing exercise, the researchers gave attention not only to what spaces and features were represented but also how they were represented. For example, were certain features being drawn on a larger scale (indicating relative importance)? Are spaces that were designated as "men's" (in group discussions) represented on women's maps and *vice versa*? Areas where resource maps and benefit analysis charts were prepared include villages Cimbwinda, Zidala and Mathotho for rivers Mwanza, Mkulumadzi, and Lisungwi, respectively.

All data collection points for questionnaires, focus group discussions, resource maps and benefit analysis chart's geographical positions were recorded using a Geographical Positioning System (GPS) and the data was used to indicate study points in the study area maps.

Gender-desegregated Data

Alongside the desegregations of data on the basis of sex, data was also disaggregated on the basis of other differentiating social variables such as class, age, marital status and household headship. This enabled researchers to better understand and document the range of social/gender dynamics operating at the level of the household and community levels and role played by such dynamics in shaping the ability of resource users/managers to manage natural resources.

Ethical Considerations

Research involved collection of data on income levels, literacy levels and also involved interviews with local leaders. The research team ensured that the source of information was kept confidential. Since the researchers were already familiar with the area, participants were treated in a manner that ensured that their dignity and integrity were protected. The participants were informed that their names would not be recorded and only codes will be used. To gain the confidence of people, a representative from the district commissioner's office was used to introduce the research team before any work could start.

Training

Enumerators were trained on questionnaire administration, resource mapping and how to conduct focus group discussions. Local people and extension workers were also trained on how to mainstream gender in natural resource management and other development activities.

Data Analysis and Interpretation

Statistical Package for Social Scientists (SPSS) was used for data analysis. Content analysis was also used to examine the interpretations and implications of information from focus group discussion resource maps and benefit analysis charts including documents and observation reports. Simple statistical tools such as percentages and cross tabulations were used in content analysis. Interpretation and analysis of gender-disaggregated data was done to reveal the interconnectedness between the activities of women and men in natural resource management. Answers from key questions were used to help in the analysis of information from focus group discussions and questionnaires. Such an approach allowed for comparison of different respondents, and enabled in-depth analysis.

Gender resource maps enabled the researchers to explore and analyze dominant socio-cultural categories of "women" and "men" and the multiple ways in which gendered uses of space conform to or contradict such expressions. During analysis of maps and map-related discussions and observations the researchers looked for the spaces, places, and resources which women and men have access, control and made use of, what those spaces mean to women/men in order to determine which spaces meet particular personal, practical and strategic gender needs.

Benefits analysis chart as a point of departure allowed for in-depth examination and analysis of the different kinds of knowledge pertaining to natural resource management. Such an examination would then reveal crucial information about who (i.e. women/men, children) is responsible for the control, access, use and management of particular natural resource. It also provided an understanding of who benefits from the natural resource, and the ways in which individuals perceive their role as resource managers.

RESULTS AND DISCUSSION

Household Characteristics

Sixty-six of those interviewed were men while seventy-eight were women representing 44.7% and 55.3% of the interviewees, respectively. This was similar with the official sex ratio of men to women of an average of 1:1.1 (Government of Malawi 2001). In terms of age groups of the respondents, there was a good representation of different age groups. A large proportion of the respondents were in the adult category (21 years old or above) representing more than 70% of the respondents. This however meant that views of the youth component of gender group might not have been fully captured in the study. However in terms of cultural aspects of gender, older people are more knowledge in cultural customs, norms and values than the younger generation of the population.

A large proportion of the respondents were married representing 71.6% as compared to 16.3% single, 7.8% widowed, 2.1 % divorced and 2.1% separated. The fact that a

larger number of respondents were married was desirable because it allowed for more data to be collected with regard to gender roles and relations at the household level as well. Most of the people interviewed had children between one and five (62.4%) in number, followed by no children (22.7%) and lastly 14.2 % had between six and ten children. These results agreed with the national socio-economic profile (Government of Malawi 2001). The fact that a large proportion of the respondents were married could also be an indication that marriage was still highly valued in this society; this was also indicative that cultural norms were still respected.

According to Government of Malawi (2001), approximately 70% of enterprises were in petty trading, with 20% involved in agro-business. Men had higher rates of employment compared with women, and some were self employed as carpenters. The fact that women had low literacy levels and attained low education levels in the area determined the work done by women as compared to men. Few of them could be employed in the formal sector such that they were restricted to stay at home and perform household chores as housewives, farming in their farms and carry out petty trading in small markets by the roadside (Kiguli 2004). Through personal observation, focus group discussions and informal interviews, it was noted that women in the area were mostly involved in petty trading of doughnuts and fruits.

Providing for the family was women's priority. This was supported by the findings in the food security questionnaire section where women indicated that they exploited most of the natural resources in the area to ensure food security in their home. The fact that they had to start their roles at an early age required them not to attend schooling or to drop out of school earlier than their male counterparts. None of the women interviewed was employed or had any technical skills to be self employed due to their domestic responsibilities and low literacy levels.

Most of the respondents (66%) had gone as far as primary education; followed by no education at all (19.9%); followed by secondary education (13.5%) and lastly tertiary education (0.7%). When the data were disaggregated by gender, they indicated that women were the least educated of the population. There were twice more women than men who never went to school. However, there seemed to be equal number of men and women attending primary education. There were three times more men than women attending secondary level of schooling. This confirmed the fact that more girls tended to drop out of school because of the gender roles that they play in society.

Seventy three percent of the respondents came from male headed households, 12.1% from female headed households, 14.9% said there was no head of household and very few (0.7%) did not know who the head of the household was. Despite the area being a matrilineal society, males were still considered to be heads of households.

Culturally the majority of people in this area follow a matrilineal system of marriage whereby men live at their wives home. Hence one would expect the women to be more dominant in decision making at household level. However, this was not the case;

despite men coming in from the outside, they still had a cultural role of being decision makers in the household. Even gender-disaggregated data indicated that women respected the men and considered them to be heads of the household.

Further data analysis indicated that married women considered men to be head of household. Widowed women considered themselves as head of households. However divorced and separated women felt that once men leave the house there were no head of household even though they themselves were still there. This showed that the gender roles/relations were that men were heads of households. Even if there were no men in the homes, women could not consider themselves being heads of household. This indicated the deep rooting of traditional gender roles that have resulted in women being excluded from decision making.

According to WEDO (2003), traditional gender role assigning of responsibilities to women and men have resulted in political, cultural and economic barriers that even restrict women's access to natural resources. Lower levels of literacy and education among women, as was the case in the study area, may further restrict their participation in decision making processes even at household level.

Natural Resource of the Area

The respondents were asked what natural resources existed in the area using the following categories: forest, wildlife, land, water, mineral, and fisheries. Land and water were the two main resources found in all areas surrounding the three rivers. Apparently wildlife did no more exist near Mwanza River, while wildlife still existed in areas surrounding the other two rivers. This seemed to confirm field observations that Mwanza River was surrounded with deforested land; and it was the most densely populated area in comparison with the surroundings of the remaining two rivers.

Good road networks and trade centres had led to large settlements of people in areas surrounding Mwanza River. Population pressure has led to habitat destruction which in turn resulted in the disappearance of wildlife resources from areas surrounding the river. In addition deforestation had caused heavy siltation in the rivers, especially rivers Mwanza and Lisungu; that in turn had affected fish populations due to destruction of breeding sites. In addition, some respondents reported that Mwanza River even dried up during the dry season in certain years. Generally the state of natural resource was very poor. Land resources had been degraded; soil erosion and lack of nutrients had much reduced agricultural productivity in the area. Deforestation was commonplace because of continuous charcoal production at a very large scale with total disregard of future implications, especially for women who were responsible for fuel wood collection for domestic use. In Malawi, women spent six to nine hours per week collecting fuel wood for household use.

Women in developing countries were often the primary collectors of household fuel and were the ones who were forced to travel further and work harder when fuel wood or charcoal becomes scarce (WEDO 2003). Deforestation was making women spend

more time looking for fuel wood, water and food (SARDC 2000). Water resources were also becoming degraded because of siltation and thus threatening fish habitats, and that would consequently lead to further decline of fisheries resources.

Forest resources on customary land and newly gazetted reserves were under constant pressure from local inhabitants for fuel wood, medicine and income generation through charcoal selling. High demand for fuel wood in the nearby City of Blantyre coupled with a good road network has accelerated the rate of deforestation in Mwanza and Neno districts (Government of Malawi 2001).

These districts have a poverty head count of 71.4 % indicating more people were worse off compared to other districts in the Southern Region of Malawi and the country as a whole.⁵ (Government of Malawi 2001). The survey also pointed out that there was a greater degree of subsistence orientation among the poor households such that subsistence production dominates the rural economy. The fact that this subsistence economy was based on the natural resource base meant scarcity of natural resources would have very serious implications on the livelihoods of the population. These implications would be most serious on the vulnerable gender groups who are mostly women and children.

Most respondents indicated that the three rivers used to provide fish to the surrounding communities in the past with a lot of local fish species in existence. However currently, the fish populations have declined due to heavy siltation in the rivers destroying spawning areas; use of traditional fish poisoning methods killing even smaller fishes and increase in demand as a result population increment.

There were fish farmers in the district, especially in Mkulumadzi river areas of Neno (Government of Malawi 2001). Although fish farming seemed to be the responsibility of men, most respondents in this study indicated that women were involved in fishing more than men. Of the 431 fish farmers in the district only 35 were women, representing just 8 % of the total number. There was need to incorporate women in fish farming programmes in the area because of their interest in fish as an important source of protein at the household level.

Definition of Gender Roles and Relations

At Household Level

Results from this study clearly indicate that there are certain roles that are specifically associated with the different gender groups and others that are not. Predominant male roles are construction (building of houses), cultivation and charcoal making, while predominant female roles at household level include: drawing water, fetching firewood, fishing and domestic chores-cooking, washing, cleaning and taking care of the children. Cultivation, cutting grass, tree planting are shared roles. There seems to

⁵ The average poverty incidence for the Southern Region is 68.1% and that of Malawi is 65.3%

be a tendency whereby women have dual roles but men have specific roles and do not seem to help women with their roles at household level. Most of the women's roles are not transferable to men due to cultural practices. When asked to indicate spaces associated with dominant socio-cultural categories of 'women' and 'men', the respondents indicated spaces occupied by women as mostly the household and river, while men mostly occupied spaces away from home where forest and land resources were found.

Further analysis of data by sex showed the same trend whereby both sexes perceived certain roles as male roles, female roles and roles for both. There was no male that indicated that domestic chores, water collection, fetching fuel wood, charcoal making and fishing were male roles. No woman interviewed indicated that water collection, fishing, and fetching fuel wood were male roles. However some women mentioned that women do indeed participate in chores not mentioned by men to be women roles, such as building and grass cutting. Cultivation and tree planting were considered shared roles by both sexes at household level.

In case of the youth, most of the respondents seemed not to know what their roles were. This was shown by the high percentages of respondents (70.9% and 75.9% for girls and boys, respectively) not knowing what their roles were. However for those who responded only drawing of water and fetching of fuel wood were considered girl roles, while building and hunting were mentioned as specific roles for boys. The fact that the roles of girls tally with the roles of women while the roles of boys tally with the roles of men was an indication that gender roles seemed to be constructed from a very young age.

Thus gender perceptions were culturally constructed by what was considered as the norm for different gender groups in this society. Reasons that were given for differentiating assignment of household activities to girls and boys were that it was a cultural belief that certain activities had to be performed by a specific gender only such as women doing housework and taking care of the children. Certain jobs were difficult and could not be carried out by women such as building houses and charcoal making, while for men they could not manage to take care of children.

At Community Level

The roles that the different gender groups played at household level did not differ from the roles indicated for them at community level. Fetching wood fuel, collecting water and domestic chores were exclusively roles performed by females. The midwifery role for women came up at community level as a female role. Nobody indicated these roles as male roles in all the communities in which the study was carried out. Tree planting and crop cultivation were considered to be non gender-specific at community level just as they did at household level.

For men, building and hunting became exclusively male roles; no one mentioned involvement of women in these activities. At household level, some women

considered building to be a female role too; but when it came to the community level they did not feel comfortable to classify building as a role for women. This might be the case because most women would not feel safe offending the larger society by being seen to perform roles that were normally considered male roles by the society.

In case of girl and boys' roles at community level, drawing water and fetching fuel wood were considered roles for girls only. For boys, building and charcoal-making were considered roles for boys only and not girls. This seemed to agree with adult sex roles that were mentioned for men and women. Thus at community level gender roles were clearly defined from a young age so that they could be maintained. This difference on strictness of roles might have come about due to fear of ridicule at community level as compared to household level on adherence to cultural and traditional rules on gender roles.

Most respondents seemed to indicate that they did not want to be seen as acting against what was considered cultural norms or customs by performing roles not perceived right for their gender in society. This was the case because household issues extend beyond the household to include others because households in a community are linked by such criteria as kinship, ethnicity, gender and geographic location (Moser 1993). Thus decisions were based on what extended family members and neighbours perceive about the role (s) people play both at household and community level.

Focus group discussions were also used to find out which locations (spaces) were used by different gender groups in relation to natural resource management. Women tended to mention spaces that they used based on their gender roles both at household level and community level. They mentioned that the kitchen, along the river, at boreholes, big tree shades and forests as the spaces they used in relation to natural resource management. They use the kitchen for food preparation, the river for fetching water, fishing, bathing and washing, the boreholes for fetching water, under big tree shades for pounding maize and forests for collecting firewood in conformity with gender roles. Men on the other hand mentioned that the spaces they used included forest for fetching building materials and charcoal making, along the river cutting reeds for weaving mats and irrigation, homes and graveyard. Spaces occupied by men also tend to be influenced by their gender roles as breadwinners and providers of shelter in the home.

Construction of Gender Roles/Relations

The respondents were asked to free list what factors have led to the construction of gender roles and relations that exist in relation to natural resources management. They came up with inheritance of cultural perceptions, beliefs and customs, local authority and government as factors that have led to the construction of the different gender roles. Over 70% of the respondents felt that culture was the most defining factor of the various gender roles and relations existing in their area. This came as no surprise

according to the way gender roles had been defined in previous sections at household level. Triangulation of data with focus group discussions also gave similar findings.

All focus group discussion indicated inheritance and differences in strength between men and women as the factors determining gender. These were followed by culture, then nature (the belief that god designed men and women to play the roles they play), then sense of duty (feeling that the role women and men play are what they feel they have to perform) and inborn talent (role play is expression of skills that an individual is born with), then lastly availability of resources and poverty were also mentioned. Cultural inheritance of beliefs, customs and perceptions construct gender. Thus, the fact that local authority had to make sure that gender roles were adhered to, indicate that in this society gender roles and relations are culturally and socially constructed.

Maintenance and Enforcement

Maintenance of gender roles and relations came about because of need for development, punishments, and respect for authority, unity and cultural values. Gender roles were maintained mainly because everyone in the society believes that an individual had to develop personally with their roles in the households and society. In addition, those that contradicted cultural norms and values in relation to gender roles and relations were seen as if they were disrespecting the chiefs and elders and were thus punished by the chief. Hence fear of being punished and ridiculed by society also maintained the different gender roles. Punishment usually took many forms (mostly one pays to the chief livestock which can be a chicken, goat or cow depending on the fine imposed by the chief) and could be costly to the offenders such that most people would avoid committing an offence that would result in punishment.

Rooting of Gender Roles and Relations

All the areas surrounding the three rivers had most respondents indicating that these gender roles and relations are deeply rooted within their societies. More than 20% of the respondents in all three rivers felt that rooting of gender roles and relations were moderate; less than 11% of the respondents for the three rivers felt that gender roles and relations had little rooting in society. Considering the fact that punishment, respect for local authority and cultural values still enforced and maintained roles and relations of different gender groups, it should be expected that they should still be much rooted within society; and analysis of results confirmed these observations.

Assignment in Household Activities

The respondents were asked whether they assign household activities by gender. This was done in order to find out if cultural inheritance of gender roles and relations was done through assignment of activities from a younger age. More than 50% of the respondents in all the areas surrounding the three rivers indicated that they tended to assign household activities based on the gender of their child while less than 50% of them did not. This assigning of household activities according to sex of the child made

them to get prepared for the roles they would perform as adults. This explained why girls' roles were similar to those carried out by women and boys' roles were similar to those of men.

Most male respondents assign household activities based on the gender of the child while most female respondents did not. Though males were very strict on what they consider as male roles and female roles, respectively, than their female counterparts, they did not feel there was much rooting of gender roles and relations. Men thus did not perceive that women played many roles at household level than themselves (men) because they do not seem to realize it. As a sequel, gender mainstreaming in this society would not be an easy matter, because of differences in perceptions and attitudes between men and women.

Correspondence of Gender Division of Activities with Cultural Perceptions of Gender Roles

For all the areas surrounding the three rivers, more than half of the respondents felt that gender division of activities corresponded with cultural perceptions to larger extent, and about 30% felt to a medium extent. This showed that culture was still not eroded within these societies, since gender roles and relations were in line with what were considered cultural norms. For areas surrounding Mwanza River there were some people who felt that gender division of labour corresponded, to a limited extent, with cultural norms. This was to be expected as some villages surrounding Mwanza River were close to urban centres where some cultural norms and customs were not strictly followed, while the areas surrounding the other two rivers were mostly rural areas.

Contradiction of Gender Division of Labour with Cultural Norms

Most respondents felt that there was no contradiction of gender division of labour with what was considered cultural norms. There was no difference between respondents in all areas surrounding the three rivers on whether gender division of labour contradicted cultural norms. This confirmed that the above findings, that division of labour corresponded with cultural perceptions. However for those respondents who indicated that there was contradiction of gender division of labour with cultural norms indicated that some men were playing female roles at household level, such as collecting water and cooking, even though their wives were not sick. This was seen as contradicting cultural norms as these are considered exclusively female roles.

Triangulation of data from all research tools in the study gave the most important factor determining gender roles and relation as cultural inheritance of beliefs and perception that women and men had different roles to play in natural resource management. There was social construction of female and male gender roles in relation to natural resource management that was inherited from parents through what an individual was taught as cultural norms and values. This made men and women

interact differently with the environment and natural resources depending on the roles assigned at both household and community level.

Most focus group discussion results, five out of eight groups, indicated that gender division of activities did conform to normative ideals while some, three of them, indicated that they did not conform to normative ideals. The discussion groups that indicated that they do not conform were all key informant focus discussion groups, made up of traditional leaders. Traditional leaders know what happens in their areas of jurisdiction and as indicated by some respondents, there were then changes in gender division of labour due to external influences such as gender mainstreaming activities and the media. Some respondents indicated that there were certain men that were performing activities that were culturally perceived as activities for women such as collecting water and fuel wood contradicting cultural normative ideals. This was just an indication of the beginning of socio-cultural changes in gender issues in the area.

Are Natural Resource Management Activities Embedded within Cultural Practices and Beliefs?

Further analysis was done to find out whether natural resource management activities were embedded within cultural practices and beliefs. For all areas surrounding the three rivers, more than 70% of the respondents indicated that natural resource management activities were embedded in cultural practices and beliefs. There was no difference between male and female respondents. These meant that natural resource management issues should consider cultural aspects of conservation when programs are designed in an area, and try to understand the gender roles and relations embedded in these beliefs so that they can better involve different gender groups in natural resource management programs. Respondents gave examples of natural resource management practices embedded with in cultural practices and beliefs such as the following: no cutting of trees, killing of animals or collecting soil from graveyards; certain trees should not be cut near homes because they provide good shade; certain trees should not be cut but left in the fields because they increase soil fertility and also cutting of medicinal trees is prohibited; some animals should not be killed such as owls and those that are not eaten; and burning of grass is also not allowed.

There was a danger of main streaming gender to an extent that cultural aspects of conservation could also be lost with what was previously considered the norm. The fact that in addition to gender roles being culturally constructed, and natural resources management activities being embedded in cultural practices and beliefs, then access, use and control of natural resources by different gender groups would depend on what was considered culturally the norm.

Focus group discussions indicated several natural resource management activities that were embedded within cultural practices such as: water fetching skills, food preservation skills, construction of firebreaks around natural resources, planting certain indigenous trees that increased soil fertility, traditional medicine tree

preservation, soil improvement skills like compost manure making, making hole handles using trees, making baskets, mats chairs and granaries using reeds and bamboo, fishing techniques, charcoal making techniques, lime making skills, animal skin processing skills, folk tales and myth telling related to natural resource use and management, wood carving for household tools, making ceramic products, hunting techniques and house construction techniques. These cultural practices were passed on from parents to children based on gender roles they perform at both household and community levels.

Effects of Gender Roles and Relations on Access to Natural Resources

There was variation of accessing varied natural resources by different gender groups. Access depended on gender roles they play in society. Water was mostly accessed by females because females were the ones that collect water, as well as doing household chores that require water resources such as cooking and washing. Wildlife was mostly accessed by males because hunting was considered a male role. Land was accessed by both males and females since farming was done by both males and females. Though for those that chose one sex alone, most of them felt that land was mostly accessed by males. Fisheries resources were mostly accessed by both males and females. All the results above on use of natural resources agreed with the finding of Meinzen-Dick *et al.* (1997); cultural norms differentiated the way men and women were allowed to use forest resources.

When the data was further analyzed by gender, forest, land wildlife and fish resources were resources that most respondents felt were predominantly accessed by males. Thus out of the six natural resource components for which gender related data was gathered, four were mostly accessed by men, while females mostly accessed only one resource, water. This means that women's access to resources was limited by their gender roles, and that were in turn culturally determined. According to Meinzen-Dick *et al.* (1997), women usually face biases to access of natural resources, and these gender differences in access in turn affect natural resource use in four main areas: environmental sustainability, efficiency of resource use, equity of resource allocation among users and empowerment of users particularly women.

In Tswana customary law, everyone should have access to land but in reality, access to land was differentiated by gender. Studies carried out in SADC countries indicated that women did not enjoy similar rights in terms of access as men, because, within most communities, rights and access to resources were often organized through kinship, gender-based division of labour and type of production (SARDC 2000). Women had use rights but not full access rights to most resources. This has implications on their livelihoods as well, since the resources that they access had low economic value as compared to those men access, i.e. forest resources, land resources and wildlife resources. Access to and control of resources is one of the principle factors determining the economic and social well being of women (Bashaw 2004).

Focus group discussion responses mostly indicated that there were differences in access to resources based on differences in gender roles. Respondents believed that differences in strength between men and women made men to be able to access most of the resources, especially forest products and wildlife resources. Women do not have the strength to cut or log trees for charcoal production.

At community level, access to resources was difficult for certain members of the community because they had to get authorization from chiefs to access certain resources such as land and trees. Division of labour at household level was another reason given that affected access to resources because men could not access water resources since it was not their role to collect water thus they had to wait for women to provide the water. However some respondents felt that there was no problem in access to land resources for all gender groups.

Control of Natural Resources

Even though most respondents felt forest resources were controlled by both men and women further analysis revealed that most respondents felt that all resources except water were controlled by men, even though women were free to use and access the different natural resources, the extent to which they use and access resources was less than men. Men commonly had rights to control land resources, including overall control of revenue generated from it (SARDC 2000). Women generally did not have rights to control most of natural resources, while men commonly had full disposal rights of resources, women only had use rights. People in society are known to hold beliefs about appropriate structures, domestic authority, decision-making, and spheres of responsibility, authority and division of tasks. These in turn shape and are shaped by beliefs about rights of access to and control of resources (Francis 1995). Thus in the study area women just had use and access rights to most resources but no control over them. Francis (1995), in her study of *Luo* households found that a woman had fewer spheres of decision-making power compared to men. In the present study also the differences were high between the two sexes when it came to control of the different natural resources especially those that have economic benefits such as land, forest and wildlife resources.

Despite the study area being a matrilineal society where land inheritance passes through the female line and men come to settle in their wives home village, men still had greater control of land resources than women. In focus group discussions, it was mentioned that women, since they had little control of natural resources, were sometimes refused access and use of certain resources. In certain cases they had to seek consent from men before accessing most natural resources. Personal observation during resource mapping revealed that men tended to be very particular about boundaries and seemed to know the village boundaries more than women. This was due to traditional aspects in matrilineal societies. Despite the women inheriting land from their mothers, when a man marries into the family, he is the one who is taken to

be shown the land and village boundaries. Even though women traditionally own the land, in reality men are the ones that were in control of the resource.

In many African societies, regardless of whether they were patrilineal or matrilineal, they tended to confer only usufruct rights of land to women (Flintan 2003). In practice, men control nearly all the property and women only had use rights despite women having the legal right to own land or trees. In Kipsigis society Von Bülow (1992) found that men had ultimate rights in most important forms of productive resources such as land and livestock. Men had a right to hold predominant control of the most important productive resources in the community. Sørensen (1992) also found that economic changes have impacted on gender relations by widening the gap in resource control between men and women control in Kipsigis society. Commercialisation of natural resources, such as commercial exploitation of forest resources for charcoal making and selling, as compared to subsistence exploitation for fire wood, or commercialisation of land as a source that can be rented rather than being used for food crop production, had widened the gap between resources that women and men control in areas surrounding the three rivers.

Effect of Use, Access and Control of Different Natural Resources on Livelihoods

Differences in access, use and control of different natural resources affecting livelihoods

The fact that there were differences in how different gender groups and sexes use, access and control the different natural resources may have an effect on livelihoods. Most of the respondents indicated that both men and women's livelihoods were affected by differences in use, access and control of the different natural resources. They were affected in the sense that because men controlled most of the resources especially those offering higher economic benefits, it meant women had to ask permission from men before accessing or using these resources. Women reported that sometimes they were refused the freedom to access certain resources especially those with good economic value.

Men complained that charcoal making which was rather profitable was not a business venture for women because what was involved was not considered the cultural norm for women and thus contradicted cultural norms. This made women more susceptible to poverty resulting into poor standards of living due to limitations in exploitation of land resources. Men also felt that access, use and control of land resources was affecting their livelihoods because of the matrilineal "*Chikamwini*" system whereby land was inherited by women from their matrilineal line. Men join their wives once they are married and live in the woman's home and cultivate land that belongs to their wife. In addition both men and women felt that now that the environment is degraded, most natural resources could not be easily accessed and this was affecting their livelihoods because they depend on these resources for food and income-generating activities.

Women in the study area were relatively more disadvantaged compared with men in terms of access to essential resources; this coupled with the prevailing high illiteracy of women. They were thus mostly limited to farming and other domestic chores rather than involvement in economic activities (Government of Malawi 2001). This confirmed the fact that indeed women were relatively more negatively affected than men by differences in access, use and control of natural resources, and this impacted on their livelihood status as well.

Gender Aspects of Cultural Differences

Respondents of the Ngoni (62%) and Mang'anja (58%) tribe felt that differences in access, use and control affected livelihoods. Most Chewa tribe respondents (58%) felt that differences in access, use and control of natural resources did not affect livelihoods, while 42% felt it did. Rose (2002), found that Chewa women exercised considerable control over land resources in the sense that a woman had rights over land allocation and use, because she inherited land from relatives in her maternal village and participated in a female support system. This might explain why most Chewa tribe respondents indicated that differences in access use and control of natural resources did not affect their livelihoods.

Differences in outlook on access, use and control of natural resources affected depended on relations between men and women within the society based on cultural aspects of the different tribes. For example the Ngoni and the Chewa assign different activities based on sex of the individual, while the Mang'anja did not assign activities based on gender. The Ngoni had more respondents indicating that they used social networks in performing certain activities while most of the respondents from the other tribes said they did not. This indicated that there were certain social interactions within the tribes (ethnic groups) that might have determined whether access, use and control of different natural resources should affect more livelihoods of different people in society or not.

Further analysis of data revealed that differences in access, use and control of the different gender groups to natural resources have impacts on livelihoods through changes in labour, time, resource use and culture. Lack of access to resources such as forest, water and wildlife meant increased labour to look for firewood and water from far places; more time spent in performing activities such as collecting water and firewood. Decreased access to a resource meant that they cannot use it; that will subsequently result in loss of traditional practices such as medicine collection and knowledge, loss of hunting traditions, loss of local technological skills such as traditional fishing technologies and even loss of cultural sites.

Natural Resources Use for Poverty Alleviation

Most respondents felt that forest resources and land contributed most to poverty alleviation for both men (through selling of forest products and charcoal) and women (selling fuel wood), though there were more respondents mentioning men as the main

beneficiaries of forest and land resources rather than women. Land alleviates poverty through short leases and selling, however considering the fact that land belongs to women in this matrilineal society, it was surprising that men also benefited from land lease and selling. In fact more respondents (63 %) perceived that men benefited from land resources compared with women (58%). Although women traditionally have land rights to use it or to lease it, the money collected from leasing and selling of land go to men.

Wildlife and mineral resources also contributed towards income generating for both men and women, albeit to a lesser extent than contribution from land and forest resources, through selling of wild meat and pottery products. Respondents also indicated that women (44%) were generating income through selling fish more than men (2%) and access fish resources for food. Since fisheries resources were dwindling, they have reverted to be used primarily by women. Many respondents felt that mostly men alleviate their poverty through selling of forest, land, wildlife and mineral resources than women did. The fact that there were different levels in exploitation of different natural resources by gender implied differences in benefits derived from the resources, hence their differential impact on livelihood and poverty status.

The poverty conditions experienced by millions of women across the world are closely linked to the limitations they confront to gain access to resources among which are natural resources. It was apparently clear that only women were responsible for food in the home and none of the respondents indicated that men use these resources for food in the home. This indicated that men mostly exploit resources for economic gains, while women exploit resources both for food and economic benefits, though the latter to a lesser extent. This meant that women exploited resources for subsistence purposes, while men for commercial purposes. Most conservationists have indicated that exploitation of resources commercial resources tends to be more damaging than subsistence exploitation of resources. Women thus were more rational exploiters of natural resources compared to men. However, most respondents indicated that resources were being overexploited in the area and thus becoming scarce.

Scarcity of resources such forests and water tended to increase the burden on women who have to travel long distances to get them. Thus there was need to ensure equity in access and benefit sharing of benefits arising out of utilization of natural resources between men and women in the areas surrounding the three rivers, if poverty, especially women poverty, was to be alleviated. Poverty reduction strategies must pay serious attention to reducing gender disparities in relation to access and control of resources, especially major assets held by households such as land, because incidence of poverty was highly correlated with lack of access to land (Bashaw 2004).

Natural Resources and Food Security

Respondents mentioned resources in their following order of importance: fish resources (72%), land resources (67%), forest resources (50%), wildlife (49%), water (24%) and lastly minerals (2%). Fisheries resource is an important source of protein for the people in the area because they use it as relish; in Malawi fisheries resources provide 70% of animal protein. In addition, by selling the fish they can buy food such as maize thereby ensuring food security in their homes.

Land resources ensure food security because the land can be cultivated and food for the house produced for home use. The great majority of the population (90%) in the study area was informally employed in subsistence agriculture with 90% of the land planted with maize, the staple food in the country (Government of Malawi 2001). It was noted in the present study that 74% of the respondents were farmers with 44.6% of the total being women. On the other hand, by leasing or selling the land some cash was generated in order to avail money that could be used to buy food, therefore ensuring food security in the home. Leasing of land was much preferred to selling because of fear of alienating customary land. This meant that land resources were important for the women who were mostly involved in farming because of their low education/high illiteracy levels and they were the ones that mostly ensured food security in the home.

Forest resources contributed to food security indirectly through use of money generated from sale of forest products to buy food for the home. In addition some forest products such as fruits, mushrooms and honey could either be eaten or sold, and when sold generated income for buying food thus ensuring food security in the home.

Water resources ensured food security through its use for irrigation to grow food for the house as well as growing vegetables which could either be eaten or sold to generate income for buying food. Mineral resources contributed to food security indirectly by generating income from pottery sales.

Women were the ones that were mostly concerned with use of all the resources for food showing the importance of women in ensuring food security in the home. This indicated how women's and men's social roles and their relationship with each other determined natural resource management.

Food insecurity and malnutrition in rural Africa could partly be attributed to lack of access and control over land (SARDC 2000). In certain cases, men because of their control over land resources often made decisions on which crops to plant on what land, whether it would be cash crops or food crops. Production of cash crops could lead to food insecurity since women were often not in control of the income that was generated from sales of cash crops. According to Rose (2002), although women have considerable control on land in the Chewa tribe, men may control production on the land though tradition holds that men cannot control inheritance of their wives land.

Natural Resources Valued by Different Gender Groups Value

It is clear from the results that men valued forest and land resources; the women on the other hand valued forest and water resources; girls valued water and forest resources, while boys valued forest and water resources, in that order, respectively. Respondents indicated that men valued forest and land resources most, because they use forest resources for building and construction, charcoal making and also grass for thatching houses.

Land resources were valued because they were used for growing crops and building houses. Men also valued wildlife resources because they were a source of food. These results showed that men used resources that were usually associated with their gender roles in society household heads as bread winners and family protectors through provision of shelter. They also had to earn income for the home through selling of these natural resources. SARDC (2000) stated that men's traditional roles required them to construct houses and granaries using forest resources.

Respondents felt that women value water and forest followed by land resources. Water was highly valued because of their daily household chores require water, e.g. for cooking and cleaning. Forest resources were valued because they were a source of firewood, and medicine. Fish resources were also valued by women because they were a source of food in the home. Women tended to exploit natural resources for subsistence use while men usually exploited resources for cash (Flintan 2003), and this in turn brings about differences in how men and women value different natural resources. Boys valued forest resources most because of charcoal making business and fruits. Girls valued water and forest resources most just like women, because they were involved in helping women in domestic chores. Results from resource mapping also showed that men valued forest resources and land more than women did, while women valued water resources most. Resource maps drawn by men tended to show more places where forests and land (farms) were located in the village indicating that these resources were mostly associated with socio-cultural category of men. Benefit analysis charts also showed that men benefit more from selling the natural resources that they indicated they value.

Needs in relation to Natural Resources Management

Men's short-term needs included: tree seedlings, boreholes, employment, farming facilities, irrigation facilities, business loans, livestock breeding stock, food, tarmac roads. Results from focus group discussions also gave the same responses as those from questionnaires. Men's short-term needs were related to their gender roles as breadwinners and providers of shelter. They needed all these things so that they could generate more income from resources because more trees meant more charcoal production which can be easily transported by tarmac roads.

Men's focus group discussion group results gave the following as men's short-term needs: tree seedlings, boreholes, irrigation facilities, small business loans, good

animal breeds, bee keeping, employment opportunities so that they stop charcoal making which is destroying the environment, food, farm inputs, fish farming, training in natural resource management and schools.

Women's short-term needs included: boreholes, tree seedlings, irrigation facilities, business loans, food, farm facilities, maize mills and health facilities. Women short-term needs were related to their gender role of doing household chores, farming and taking care of the children. Moser (1993) stated that gender division of labour within the household gave women responsibility not only for domestic work involving child care, but also family health and food provision. Women thus tended to identify their practical gender needs with focus on the domestic arena and income generating activities; this was also the case with the present findings.

Boreholes would ensure constant supply of safe clean water, therefore lessening the burden of travelling long distances to collect water which would likely be contaminated and cause of disease. Tree seedlings would ensure energy supply in the home while farming and irrigation facilities would ensure food security in the house. Most female respondents were involved in petty trade and generate some income from their business that they could use in the home. Women also indicated that they needed maize mills for milling maize which is a staple food, and because of the responsibility of family health they need health facilities too. Women focus group discussions also gave boreholes, tree seedlings, health facilities, irrigation facilities, maize mills, food, farm inputs, bee keeping, fish farming, markets, adult education and civic education in natural resource management as their short-term needs. This was similar to what respondents indicated as women's short-term needs.

Girls' short-term needs included boreholes, food and schools. Boreholes were needed, since their roles were in the household where they often help their mothers in collecting water. Food was very crucial for girls as it was for women because of nurturing roles they play in the home. They could not go to school hungry. Schools were also needed so that pupils do not have to travel long distances to access education.

Boys' short-term needs included tarmac roads, boreholes, food and schools. Tarmac roads would ensure good transportation system for boys who were involved in charcoal and fruit selling. Sometimes boys helped in household collection of water thus they would need easy access of safe drinking water as well. Just like girls, boys needed school facilities within their vicinity so that they would not have to travel very long distances to access education.

Focus group discussions involving traditional leaders as key informants gave the following as short-term needs: tree seedlings, employment, end to corruption by forest government workers in charcoal selling businesses, irrigation facilities, micro-business loans, fish farming training, markets with fair prices for local commodities,

food for work, more agriculture and forest extension workers and empowerment of traditional leaders to enforce natural resource management regulations.

Responses of key informants however overlooked the most important need of women, which was safe drinking water from boreholes. This could be due to the fact that traditional leaders were mostly men. There was only one woman that was encountered as a traditional leader in the focus group conducted in Mwanza River area. However she too did not mention what women mostly indicated as their number one priority in the area, boreholes which can provide them with safe drinking water thereby avoiding water borne diseases. This could be due to the fact that it was mostly men who are able to articulate and promote issues relevant to them making planners fail to recognize women's needs and also the fact that women and men have different needs, preferences and priorities (Flintan 2003).

CONCLUSION

Gender roles and relations *vis a vis* natural resources management in areas surrounding Lisungwi, Mwanza and Mkulumadzi Rivers were socially constructed and were defined by cultural perceptions of what women's and men's gender roles were. These gender roles and relations are maintained as a result of being passed on by parents to their children through generations. However, in some areas these cultural perceptions are changing due to the fact that certain gender groups are performing gender roles that are not considered the cultural norm. The socially constructed gender roles and relations have brought about gender divisions of labour and responsibilities. These gender divisions of labour have differentiated how the men and women relate with natural resources and use them based on their gender roles at household and community level.

Gender roles and relations affected access, control and use of natural resources. Use of resources mostly depended on gender roles both at household and community levels. Women used resources that they needed for carrying out household chores such as collecting water and firewood, child rearing, preparing food and medicine for the family. Men used resources as bread-winners and protectors of the family through selling of forest products such as charcoal and timber logging for house construction. Access mostly depended on gender roles and relations. Women and men could not access certain resources because they had to seek permission from those that had control over the resources. At household level women had to seek access authorization from men who were in control of access and use of resources at household level. On the other hand, men had to seek authorization from local authorities in accessing forest products, wildlife and land resources. Social divisions such as age, status and ethnicity were also important for defining who had access and power over use of resources at community level than at household level. Overall, men were found to dominate decision-making processes both at household and community levels, while women seemed to have less control over and less access to most of the resources except water.

Access, control and use of resources were found to affect livelihoods of different gender groups. Lack of access to water resources meant that there was no water for use for household chores for women, and this in turn meant women travelling long distances and investing more time in collecting water. Lack of access to resources that were used for food such as fish, fruits and wildlife meant less food at home. On the other hand, lack of access and control of income generating resources such as forest and land resources meant less income for most households. In addition lack of access and use of natural resources meant loss of cultural practices for those resources whose management and use were embedded within these cultural practices.

The study found that some natural resources have been and were being over exploited by most communities in the study area. This has led to degradation of forest and land resources and scarcity of water, fish and wildlife resources. This was having and would continue to have serious impacts on livelihoods of most members of the community, especially women who were mostly restricted by time and have heavy consistent work loads.

Environmental degradation impacts in the area will make women bear a heavier cost as a result of paucity of essential resources needed at home, and whose role it is for women to fulfil these needs. Considering the fact that women in the area had low literacy and education levels compared with men made them vulnerable to all sorts of hardships. The fact that women were not involved in decision-making processes placed them in an even more vulnerable position.

Even though there had been some gender mainstreaming programmes in the area, there hadn't been clear identification of different gender needs in relation to natural resources management. Considering the fact that communities in the study area depend mostly on natural resources for meeting their day-to-day needs, it was important to have the different gender needs determined so that the different gender groups can be effectively incorporated in natural resource use and management activities. For example women indicated that they would prefer fish farming, yet fish farming projects in the area is predominantly a man's chore. It has been shown that men and women had different needs and priorities in relation to natural resource management and these could only be identified using gender analysis as was the case in this study. Identifying these differences was important because if they were ignored, it could have adverse impacts on natural resource management.

In the case of the study area, more degradation and over exploitation of resources would continue with conservation efforts having limited impact, if at all. This was the case because, as it was made clear by the findings of this study, men and women had different relationships with the different natural resources, including different views and perceptions of the value of the different natural resources. They thus bear different costs and benefits of using and protecting these resources. A clear understanding of gender and social roles and their consideration is mandatory for sustainable utilization of natural resources.

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Chapter Five

Gender Analysis of Activities and Risks for Potential Exposure to Chemical Contaminants among Kirinya Wetland Resource users in Jinja District – Uganda

Naigaga, I., Kyangwa, M. and Mugidde, R.

INTRODUCTION

Gender refers to the different social roles that women and men play, and the power relations and processes between them (Lwanga 2001; Population Reference Bureau 2001). Gender analysis on the other hand refers to a systematic examination of these roles, relationships and processes, in respect to women and men, focusing on the imbalances (Population Reference Bureau 2001). In Uganda, in the early days of gender mainstreaming advocacy, emphasis was given to domestic violence and human rights, reproductive health aspects and women empowerment in homes and schools (Mukasa 1996; Kitto 1999; Akello 1999), with little regard to gender analysis in management of natural resources.

However, of recent many researchers have come to realize that men and women cannot be treated as identical actors in the process of environmental collective action and further arguing that such action affects women and men differently (Nyachwo 2000; Ongia 2000; Mugabe 2003). Women and men have different motivations and experiences of corporation, related to the different roles and responsibilities in their lives, families, households and communities (Population Reference Bureau 2001). Men and women have different interests and preferences in natural resource conservation, and face different constraints in participating in natural resource management institutions (Agarwal 2000; Population Reference Bureau 2001).

Understanding women and men's relationships with the environment plays an important role in developing solutions leading to more sustainable use of natural resources (Population Reference Bureau 2001). Neglecting gender, not only leads to a mis-assessment of the existing community institutions for natural resource management in terms of participation, distributional equity and efficiency, but also distorts the understanding of human impacts on the resource (Population Reference Bureau 2001; Agarwal 2000). This leads to concealment of opportunities for forming and sustaining successful resource management groups through women's more substantial involvement. Agarwal (2000) discovered that institutions which looked successful after assessing group functioning, e.g. participation, equity and efficiency,

lacked a gender perspective in the extent of community participation in decision-making, equity in the distribution of costs and benefits, and efficiency in protecting and regenerating the resource.

The present study was initiated to address a gender analysis of risks for potential exposure to chemical contaminants among Kirinya wetland resource users. It is expected that such findings would help identify (i) how women, men, boys and girls utilise this wetland resource and the respective values attached, (ii) the activities carried out by men, women, boys and girls that are likely to degrade this wetland, (iii) whether such activities pose equal risks of exposure to chemical and biological contaminants to all gender groups; and (iv) whether men and women have equal access to and control over to the wetland resource.

The undertaking contributed to a multidisciplinary research project sponsored under the Lake Victoria Research Initiative (VicRes) that was investigating total mercury and radioisotope levels in selected fish commonly consumed by communities around selected wetlands in the Lake Victoria basin of Uganda and Kenya (Muggide *et al.* 2005). This project aimed to provide information on the fisheries of Kirinya wetland, determine the levels of radio-isotopes and mercury contaminants in fish and water, and assess the physical-chemical environment of the wetland. The study areas included five wetlands and their respective fish landing sites. Two wetlands are located in Uganda - Kirinya in Jinja Town and Murchison Bay in Kampala City. The wetlands in Kenya included Sondu-Miriwu in Rachuonyo District, and Lwangni and Nyalenda both found in Kisumu City.

Results so far have indicated low doses of potassium and uranium in fish in all the study sites, and except for Nile perch, fish from all the wetlands accumulated low levels of total mercury (Muggide *et al.* 2005). Nile perch weighing between 0.13 and 0.8 kg contained an average of 367ng/g wet weight, a concentration below the consumption advisory level of 500 ng/g but exceeding the WHO threshold for at risk groups (pregnant women and children) of 200ng/g in fish weighing 3– 10kg (Muggide *et al.* 2005). The socio-economic profiles indicated that over 80 percent of the respondents consumed fish 3 to 4 times a week and sourcing it mostly from the neighbourhood wetlands/landing sites or local markets in the vicinity (Muggide *et al.* 2005).

A gender analysis was missing in the above ongoing VicRes project (Muggide *et al.* 2005) and this study helps to fill that gap. It is well understood that men and women often perform specified activities when it comes to wetland natural resource utilization and encroachment; and each gender group tags a different values to activities carried out at the site. Youth, men and women carry out same activities for different reasons, and at different times. Likewise, the levels of health risks and potential exposure to contaminants faced by women, men and children as a result of these differences and roles performed may be variable. It was such aspects that were not considered in the ongoing VicRes project but which were later on addressed in the gender analysis

study. The gender analysis study was further motivated by the fact that the women and children who spend more time at home with continuous contact with polluted and hence faced higher risks of exposure to contaminants. Men often spend most of their time at sites of work in town, away from polluted /contaminated environment

Environmental degradation has impacted on the flora and fauna of the wetland habitat, resulting in change of composition of wildlife resources, e.g. less fish, more monkeys, and also total disappearance of certain wildlife species. Changes in wetland resource use were also rampant; there was enhanced utilization of the resource, e.g. increased gardening, frequent gathering of firewood, as reported by communities residing in localities bordering the wetlands in Jinja (Jinja District Profile 2003). However the impacts of various activities by different gender groups are not clearly understood; i.e. which gender group's activities impact negatively on what wetland resource.

Use of Wetlands in Uganda

Wetlands in Uganda include all those areas where plants and animals live in association with permanent or temporally flooding (NEAP 1990). Wetlands in Uganda are widespread and are estimated to cover about 13% of the land surface, thus constituting an important natural resource in the country in terms of ecological, social and economic benefits (Bakema and Iyango 2000). The Ugandan wetlands harbour high species diversity of both fauna and flora, thus serving as sources of herbs and food (fish and wild food plants) for their respective local communities. They also serve as water sources for domestic and livestock use and are sources of fuel, raw materials for building/construction and handicrafts. In urban areas, wetlands have played a tertiary role of retention of sediment from runoff, tertiary treatment of nutrients and sewage and extraction of toxic effluents and contaminants from industries and urban settlement effluents (NEMA 2001; NEAP 1990).

The wide distribution of wetlands in the country and their finger-like shapes have led to an assertion that the majority of the Ugandan population lives within walking distance from a wetland edges and many interface with wetlands on daily basis (Bakema and Iyango 2000), and Kirinya wetland is no exception; it is surrounded by a community that depend on it for farming, fishing, water and raw materials.

The main value obtained from wetlands, as conceived by many is production and consumption goods such as water, fish, firewood, building materials, agricultural products, medicine, pasture, etc. (Luwumu and Acuba 1998; Bakema and Iyango 2000). A review of the National Wetland Policy Project site activities indicated that immediate economic benefits were the major contribution of wetlands to the communities, followed by wetland services (Luwumu and Acuba 1998). However, it was not possible to establish who was benefiting what *vis a vis* gender. Women, men and the youth use wetlands differently, and they tag different values to these uses, in relation to the roles they perform in society based on gender (Lwanga 2001). For example, women may perform both domestic and economic activities, while men

perform mainly economic activities as their domestic activities are limited (Population Reference Bureau 2001; Flintan 2003). Gender relations in the utilization of the wetlands were not well appreciated and as a result, it was not clearly established who was doing what in the Ugandan wetlands *vis a vis* gender.

A number of training and awareness programmes had been carried out in the past by the Wetland Inspection Division (WID), formerly known as the National Wetland Programme but many of these trainings were not gender-sensitive. Of recent, policy makers, after realizing the different roles played by women and men in natural resource utilization and management, were giving gender issues serious considerations. The Wetland Inspection Division is reviewing the national policy for the conservation and management of wetland resources (1995) to include gender relations.

Degradation of Wetlands in Uganda

In this study, degradation refers to the destruction of a potentially renewable resource such as wetlands, by consuming it at a rate faster than it is naturally renewed and if such use continues, the resource can become non-renewable or nonexistent on a human time scale. The trend in Uganda today is continued loss of wetlands due to human encroachment, and degradation of the remaining wetlands through various activities carried out within and outside the wetlands.

Urban wetland encroachment and the resulting degradation in developing countries have been regarded as a survival strategy for the poor who are often not employed. In Jinja, wetland encroachment is becoming increasingly important due to the high rate of urbanization accompanied by the rapid growth of unemployment (Jinja District Profile 2003). The rising population density in Jinja is attributed to immigration of the poor from rural areas in search of employment in industries, factories and hotels. However, this town is transforming into a tourist attraction location and this has led to closure of a number of industries; and recreation centres have been established in their place. As a result, many people who were working in industries lost their jobs thus exacerbating unemployment. This situation is made worse by political instability in some parts of the country as well as in neighbouring countries, i.e. Rwanda, Burundi, Sudan and the Democratic Republic of Congo, forcing the people to move to the urban areas in search of employment as well as security.

In addition to pressure exerted by resource users, Kirinya wetland receive waste from residential areas and municipal waste (sewage) and industries (organic and inorganic effluents, including heavy metals). The population residing in areas bordering this wetland has increased many fold in the last ten years or so (Jinja District Profile 2003), thus exacerbating the situation. As a result of the serious contamination of the wetland, the resource users in the area faced serious health risk, including exposure to heavy metal contaminants, pesticides and radio-isotopes.

It is generally believed that the poor are the main causes for the pollution of wetlands and subsequent degradation of the same. However over time, many studies have revealed that it is wealthier groups / individuals who control and use these areas and are also responsible for their subsequent degradation. For example in Ethiopia, it has been reported that relatively rich farmers who most frequently exploit wetlands, and the involvement of the poor in this regard is relatively low (Hailu 1998; Mulugeta 1999).

Uganda's wetlands are protected by the National Environmental Statute to safe guard these habitats against destructive activities, so that they can continue to serve their ecological functions (NEAP 1990). However, most of these wetlands were still being reclaimed and degraded, especially those outside protected areas. Some of the known forms of encroachment and destructive uses include dumping of waste, pollution, conversion/drainage of wetlands for agricultural purposes, excavation in the form of sand, mining and extraction of clay for brick making, deforestation of swamp forests and rampant swamp fires. Although it is recognized that wetlands are important in tertiary treatment of sewage and retention and extraction of industrial and toxic waste in urban areas, efforts to conserve them have been wanting.

Access, Management and Conservation of Wetlands in Uganda

Wetlands are held in trust for the people of Uganda and are constitutionally protected and reserved for the common good of all citizens. The government has got a clear set of laws and regulations that govern the use of wetland resources. Every Ugandan citizen is free to access the wetland resources as long as their activities were held within the limits of as stipulated by the local authority.

Uganda adopted the policy of decentralization with the aim of creating a democratic, participatory, efficient and development-oriented local government system. The decentralization programme seeks to transfer political, administrative, financial and planning authority from the centre to local government councils (RoU 1993). The decentralization of decision-making powers over natural resources to publicly accountable authorities is frequently advocated as a means of achieving social development and enhancing natural resource management. This implies that local governments can make bylaws on environmental matters that take into account the needs of people at the local level, without reference to the centre. Thus, district administrators are empowered to plan for development, including the use and management of natural resources such as wetlands within the context of national policies and guidelines.

Each level of Uganda's political-administrative structure has an elected local council, elected for a five-year mandate. The lowest level is the Village, whose council is called LCI. Above the village is the Ward or Parish council (LCII), the Sub-county or Town Council (LCIII), the County (LCIV) and the highest level of local government, the District Council (LCV). LC I, II and IV are considered Administrative Units,

while III and V are considered Local Governments (RoU 1993; NEMA 1996; Bazaara 2003). Within the local council structures, there are elected representatives at all levels, from LCI to LCV who serve as secretaries in charge of production and environment. These are the contact persons on behalf of the community on wetland and environment issues, organize public meetings to educate and mobilize residents on proper environment management, e.g. good sanitation, good farming practices, tree planting and proper use of wetlands; collect and disseminate information on environment; link communities with extension staff, NGOs/CBOs and other support agencies; act as an overseer and inform relevant authorities on activities that may be destructive to the environment and well being of the community and enforce government laws and bylaws to ensure that members of the community in his or her area follow such laws (NES 1995 and NEMA 1996).

However, a comprehensive analysis of the decentralization reform from an environmental perspective indicates three major problem areas (Bazaara 2003). Firstly, there is no effective or consistent decentralization of powers over natural resource management. Secondly, local governments had failed to exercise the limited powers they have, since control over the necessary financial and human resources have remained centralized. Lastly when local governments has attempted to influence environmental matters, the social environmental outcomes have not always been positive, due to conflicts of interest among the actors involved in natural resource utilization at the local level.

Wetland conservation in Uganda was first recognized in 1986 when the government banned large-scale drainage of wetlands until a national wetlands policy was put in place. In 1989, the National Wetlands Conservation and Management Programme was formed within the Department of Environment Protection with technical assistance from the World Conservation Union (IUCN), to assist government develop the policy and seek alternatives to unsuitable use of wetlands.

A National Wetland Policy was adopted by the government in 1994, which described in broad terms how the government intended to deal with Uganda's wetlands. The goal of the policy was "to promote the conservation of Uganda's wetlands in order to sustain their ecological and socio-economic functions for the present and future well being of the people" (RoU 1995). This led to the National Environment Statute (NES) in 1995, which in turn gave detailed rules and procedures on what can and cannot be done in wetlands. The NES was further operationalised through the National Environment (wetlands, river banks and lake shores management) Regulations 2000. In addition to the NES, other laws like the Local Government Act and the Land Act reinforce and gave further details to specific aspects of wetland management. Reference to wetland ownership, protection and conservation are also contained in the constitution. The NES established the National Environment Management Authority (NEMA), responsible to supervise, monitoring and co-ordinate activities related to the environment, taking over most of the functions of the Department of Environment

Protection. The NES also assigned the responsibility of wetland management in Uganda to the Wetlands Inspection Division (WID), Ministry of Water, Lands and Environment. The WID assisted central and local governments to develop and apply a long-term policy for the conservation and management of the wetland resources and to acquire the necessary capacity (skills and finances) for implementation.

The Local Government Statute of 1993 assigned the management of wetlands to districts. In this regard, the district officers are charged with the responsibility to uphold the wetland laws and regulations. The district and local council officers are expected to effectively curb wetland abuses, and therefore, contribute to the overall goal of using Uganda's wetland resources in a sustainable manner. It is hence apparent that at policy level, wetland utilization issues are amply addressed.

Objectives of the study

The overall objective of the study was to carry out a gender analysis *vis a vis* activities associated with wetland use/abuse that potentially degrade Kirinya wetland and activities that may lead to risks of human exposure to chemical contaminants.

The specific objectives include (i) to determine wetland resource utilization by men, women, boys and girls within the communities living around this wetland and the benefits attached to these uses; (ii) to investigate activities carried out by men, women, boys and girls that may lead to wetland resource degradation through pollution with the selected contaminants; (iii) to investigate wetland resource utilization by men, women, boys and girls that may potentially lead to risks of exposure to the selected contaminants and assess their knowledge of such forms of risks; and (iv) to establish mechanisms for access to and control over wetland resources and efforts, at individual or community level, of women, men, boys and girls towards sustainable management and conservation of the wetland.

METHODOLOGY

The Study Area

The study area was Kirinya East and West wetland that was part Jinja Municipality. It was deemed that the above wetland was polluted with contaminants from various activities carried out either within the wetlands or their catchments. This wetland also receives both industrial and sewage effluent from Jinja Municipality before draining into Lake Victoria.

The study focused on gender analysis *vis activities* associated with wetlands and the risks for potential exposure to chemical contaminants among the wetland resource users in Jinja District.

Data Collection and Analysis

Questionnaires were designed to test the current state of people's knowledge on chemical pollution, their level of awareness of the potential risks, and to get information about the activities they carry out in the wetland and subsequent benefits they receive. These results were incorporated into the outcomes of the laboratory study (VicRes project).

The unit sample on which this study was based was stratified along economic activities carried out by women and men utilizing the wetland, and that enabled uniform selection of the respondents. All together, 75 men, 75 women, 7 boys and 1 girl were interviewed during the study, bringing the total number of people interviewed to 158.

The questionnaires were divided into sections following the study objectives. Focus Group Discussions (FGDs) with approximately 8-10 people were conducted with representation from different categories of people utilizing the wetland such as, women and men, farmers and fishers, and with women and men alone. FGDs were carried out after a thorough analysis of responses from individual wetland resource users. This helped to complement and strengthen findings from the structured questionnaires. Interviews with key-informants were carried out using semi-structured interview schedules. Key informants included Jinja Municipal Council Environmental Officer, the Division Environmental Assistant and an official from JUWVO.

Analysis was carried out using SPSS statistical computer package. Descriptive statistics was used for the display of the data summaries. To establish the existence of any relationship, a chi-square test was conducted. With respect to categorical data, the observations were summarized using frequencies, which were generated in percentages or counts following cross tabulation analysis.

RESULTS

Characteristics of Individual Users of Kirinya Wetland

The characteristics of individuals utilizing Kirinya wetland included a gender desegregation of the key users, their level of education, marital status and age bracket. The main individuals utilizing Kirinya wetland were men and women, with very few boys and girls. This was evident during the study as 75 men, 75 women; seven boys and one girl were encountered and interviewed during data collection. For this reason the study concentrated on men and women for further analysis, since these gender groups were found to be the main users of Kirinya wetland at individual level. There were more men in the age bracket 19 to 40 years as compared to women, while there were more women in age bracket of 40 years and above compared to men.

The education level was categorized into five as, no schooling, primary, secondary, tertiary and university. A significant relationship was observed between the education

level and gender categories ($\chi^2 = 14.259$, $df = 4$, $p < 0.05$). Amongst those who had not attained any form of education (no school), the majority were women (81.5%) as compared to men (18.5%). The majority of the interviewees had attained primary followed by secondary education, with more men in each category (58.4% and 60.5% respectively) than women with 45.2% and 39.5%, respectively.

The marital status of the respondents was categorized into five as, married, single, divorced, separated and widowed and there was a significant relationship between marital status and gender categories ($\chi^2 = 11.584$, $df = 4$, $p < 0.05$). The majority respondents were married (72%). However, more of those who were married were men (54.6%) compared to women (45.4%). Of the individuals who were not married, there were more women separated (66.7%), divorced (55.1%) and widowed (100%) compared to men with, 33.3% separated, 42.9% divorced and 0% widowed.

Activities Carried Out in Kirinya Wetland by Men and Women, and the Benefits Attained

The socio-economic activities carried out by individuals in Kirinya wetland included: crop farming, fishing, harvesting craft materials, gathering medicinal plants and grazing. A significant relationship was observed between the above activities and gender categories ($\chi^2 = 14.568$, $df = 17$, $p < 0.05$); and 86.7% of the total practiced farming. However, amongst the gender categories, 89.3% of the women practiced crop farming compared to 84% of the men. The few boys and the girl interviewed were using the wetland to catch bait (worms) for fishing and crop farming, respectively. Crops farmed ranged from vegetables such as, carrots, tomatoes, cabbage, egg plants, food crops like sweet potatoes, cassava, yams, cereals such as maize and rice, fruits such pawpaw, mangoes and sugarcane.

Benefits attained from Kirinya wetland by the individual users were identified and they included: income, food, and both income and food. Although no significant relationship ($p=0.05$) between the above benefits and the gender categories was observed, there were more men utilizing the wetland for income alone; and both income and food, 54.1% and 53.3%, respectively, than women, 45.9% and 46.7%, respectively. More women (62.2%) compared to men (37.8%) utilized the wetland for food alone. The main benefits from the wetland for the boys were income, followed by food.

Activities Carried Out by Men and Women that Degrade Kirinya Wetland with Chemical Contaminants and the Level of Awareness of Environmental Degradation with Chemicals

There was a significant relationship ($\chi^2 = 7.796$, $df = 1$, $p < 0.05$) between gender category and the level of awareness of the activities carried out in Kirinya wetland, that led to all sorts wetland degradation, from those who were aware 56.8% and 43.2% were men and women, respectively. Also when it came to specifics of

contamination by chemical pollutants, there were relatively more men than women who were aware of the situation; however the difference was not significant.

Respondents who were aware of the wetland status quo mentioned bush burning, excessive crop farming, excessive cutting of papyrus, digging trenches, growing rice, distilling local brew, grazing, effluents from factories, spraying crops, garbage disposal, washing cars, brick making and fishing immature fish as the major activities that contributed to wetland degradation.

These respondents were further asked to name the contaminants likely to be introduced into the wetland through the above activities and all together three contaminants, namely chemicals, germs and dirty/smelly water were mentioned. However to the majority of the men (64%), the main contaminant coming from within the wetland were chemicals, while to the women (63%), the main contaminants coming from within the wetland were germs.

Risks for Potential Exposure to Chemical and Biological Contaminants by Men and Women Utilizing Kirinya Wetland and an Assessment of Such Knowledge

Individuals who were familiar with wetland activities that led to exposure to contaminants were slightly more than those who were not aware, 54% and 46% respectively. A significant relationship was observed between level of awareness and gender categories ($\chi^2 = 4.536$, $df = 1$, $p < 0.05$); of those who were aware, 58% were men, while the remaining 42% were women. Amongst women, the majority (54.7%) was unaware of the activities that led to exposure to contaminants.

The reported activities that presumably led to exposure to contaminants among the wetland users included cultivation, getting baits for fishing, fishing, harvesting papyrus and swimming. Amongst the above, cultivation was mentioned as the main activity (65.4%) carried out in Kirinya wetland that may expose individuals to chemical contaminants and the response was the same for both men and women, 68.1% and 61.8%, respectively. The contaminants, that were mentioned as health risks to the wetland resource users included, from the most frequently mentioned to least mentioned, germs, chemicals, sharp objects and smelly/dirty environment.

It was noted that in addition to chemical contaminants, biological contaminants also posed a health risk to the men, women and children living in the communities associated with the wetland under study. All individual resource users were at risk of chemical and biological contamination but pregnant women and children were more vulnerable. For the purposes of this study a risk factor was defined as a condition or situation that may increase the chance of individuals getting into contact with chemicals, parasites or bacteria in the environment. Based on field observations and the community inputs, six risk factors for potential exposure to chemical and biological contaminants were identified. These included: water contact practices, proximity of gardens to chemical and biological contaminated sites, close range of residential areas to chemically contaminated sites and vector breeding sites, lack of

access to safe drinking water and sanitation facilities, filthy homesteads and over crowding in homesteads.

Access and Control of Wetland Resources as Mentioned by Women and Men

Access to wetland resources was governed by by-laws; as a result potential users need to get permission to access the resources therein. Most respondents sought permission to use Kirinya wetland from authorities, more women than men; despite the fact that relatively more men than women were knowledgeable about the existing bylaws that governed wetland resources utilization. However, group discussions and observations in the field revealed that many of the men did not abide by these laws, as many of them dug trenches and grew crops that required a lot of water such as rice, two specific activities strictly forbidden by the said regulation. On the contrary women followed the rules more seriously.

Efforts at Individual and Group Level towards Sustainable Management and Conservation of the Wetland

There were both individual and group efforts towards sustainable management of the wetland. Individual efforts entailed abiding by bylaws and these involved the users leaving a buffer zone of 100m from the garden to the edge of the wetland where papyrus grew, proper use of the wetland, provision of advice to other users, not digging trenches and avoiding bush burning. Group efforts towards sustainable management involved organization into groups, and women through JUWWO, took a leading role in this aspect compared to men. JUWWO as a women organization was responsible for planning, monitoring and regulation of the users, since they are the custodians of the wetland. To ensure conformity to the existing regulations and bylaws the organization reported to the Environment Department at the JMC. Other group efforts were carried out through sensitization carried out by the Lake Victoria Environmental Management Project and Local Councils.

The main suggestions given by the individual users towards sustainable management of Kirinya wetland revolved around law enforcement. These included, continuous sensitization of wetland users on laws, continuous enforcement of laws, avoiding bush burning, cultivating wetland friendly plants, avoiding the use of pesticides in wetlands, no digging of trenches, practicing crop rotation, observing the 100m buffer zone from papyrus stands, not growing rice in the wetland and stopping people from excessive cutting of papyrus. Of the above proposals, continuous sensitization of wetland users on laws was the most frequently mentioned suggestion by gender groups, women (56.9%) and men (60.7%). In addition women mentioned availing alternative sources of income as indirect measure for wetland conservation.

DISCUSSION

Characteristics of Individual Users of Kirinya Wetland

The target population was made up of women, men, boys and girls utilizing Kirinya wetland in various ways. Field observations and focus group discussions revealed that the youth in urban centres, were not interested in working in the wetlands as they considered such kind of work dirty, and associated it with village lifestyle. Instead, they preferred getting odd jobs in factories and retail shops in town. The other reason given was that the majority of the youth go to school, and this was attributed to the universal primary education (free primary education); hence not engaged in wetland resource exploitation on regular basis. In addition, the data collection exercise was conducted during school term so the youth/students who could be utilizing the wetland were away in school and could not be included in the study. For the above reasons, it was mainly men and women who were found to be directly utilizing Kirinya wetland at the time the research was conducted.

It was discovered that the majority of the women and men utilizing Kirinya wetland were of low socio-economic standing given that they were neither skilled nor educated. Such low skilled people stand low chances of employment in other enterprises that require skills and or education. It is therefore not surprising that these people rely on wetland resources for survival. This agrees with Flintan (2003), who stated that "both women and men in Africa and Asia, and particularly those from poorer households, can still be highly dependent on the collection of natural resources for fulfilling household needs and as a contribution to food security and poverty alleviation". It was further noted that school attendance of women was relatively low and much lower than men. This also agrees with Flintan (2003) who stated that women have less access to education and health care and fewer economic opportunities.

In Uganda, women lack of access to education could be attributed to the previous absence of universal primary education. In addition, because of the deep-rooted cultural and traditional gender roles, many parents in those days, preferred to send boys to school instead of girls, over and above marrying away their daughters at an early age.

The majority of the wetland users fell within the age brackets of 19 to 39 years with more men in this category than women. Many of them were not educated, and they resorted to the wetland resource for survival in terms of income, including management of household and payment of school fees for their children and food for home consumption. There were more women above the age of 40 were found to be utilizing the wetland resource as compared to men in the same age category. This implied that as the women get older, they resort to utilizing natural resources for survival. Some of these women had retired, and many of them had lost their jobs in factories and therefore, resorted to utilizing the wetland for survival.

Activities Carried Out in Kirinya Wetland by Men and Women and the Benefits Attained

The main socio-economic activity carried out by both women and men in Kirinya wetland was crop farming. This was in agreement with Luwum and Acuba (1998) who observed that production and consumption goods such as agricultural products were the main values obtained from wetlands by an average rural Ugandan. Although Kirinya wetland users couldn't not be classified as rural; they were dependent on wetland resources, likely because of their low socio-economic status, presumably a sequel of their low educational standing.

Women cultivated the wetland mainly for food security while men did so mainly as commercial enterprise. This is further attributed to women's reproductive and nurturing roles such as household maintenance as compared to men's productive roles that have a monetary value attached such as market/subsistence production with an actual value or potential exchange value (Francis and Jahn 2001; Flintan 2003).

However, the majority of women and men farmed for both income and food as the main benefits, implying that both women and men rely on the wetland not only for food security, but also to trade in wetland products as well as to supplement their incomes at home. This was in agreement with Flintan (2003) who revealed that though primarily men were involved in commercial enterprises, women also sold and traded in natural resources.

The fact that more women practiced crop farming than men, could be attributed to the retrenchment from factories and following closure of some of the factories in Jinja. The women resorted to farming in the wetland while the men either went to the villages or moved places in search of other employment. In addition many women were not educated as compared to men and thus stood low chances of employment else where, compared with men. It was also noted through field observations and focus group discussions that even though there were many women farmers than men; individually they had smaller gardens as compared to individual men farmers. It is possible that the total combined farm area of men was larger than that of women.

Activities that Degrade Kirinya Wetland with Chemical and Biological Contaminants and Awareness of the Degradation

Environmental degradation with chemical contaminants was still not appreciated by both women and men users of Kirinya wetland and this could be because the impacts created by chemical contamination are not seen and felt immediately. This was evident when individual users were asked to name the activities that led to any form of Kirinya wetland degradation. They mentioned activities whose effects they see and appreciate physically, such as bush burning, excessive crop farming, excessive cutting of papyrus, digging trenches, growing rice, distilling local brew and grazing. Degrading forms like effluents from factories and spraying crops that may lead to

contamination of this particular wetland with chemicals were ranked at the tail end of the listing.

Women were less aware of activities that led to wetland degradation in general and also of activities that led to wetland degradation with chemicals compared to men. This could also be attributed to women's lack of sensitization as compared to men who may be finding time to attend meeting and other extra curricular activities compared to women who often are tied up with daily domestic chores (Francis and Jahn 2001; Flintan 2003); also their lower level of education might have contributed to the low level awareness.

Men more than women stated that spraying crops grown within the wetland as the one activity that might lead to contamination of Kirinya wetland, while more women than men mentioned disposal of faecal matter as one of the major sources of contamination, more so than chemicals. This could imply that women were less aware of chemical contamination and thus could not appreciate the presence of such contaminants in the environment. The other reason could be that women appreciated the presence of biological contaminants in their environment as compared to chemical contaminants. In addition women generally have a high sense of smell and pay more attention to hygiene in their environment than men (Francis and Jahn 2001) given their reproductive and nurturing roles.

The study revealed that activities carried out by individual users of Kirinya wetland were not the main sources of chemical pollution, since activities carried out by them did not lead to introduction of chemicals pollutants to the environment. It was the institutional users of the wetland that were discharging effluent into the wetland and subsequently polluting it who were primarily responsible for wetland degradation.

A heavy metal contaminant, such as mercury that is contained in a number of industrial products enters the wetlands from runoff, rain or dust (Laws 1981; Kahatano *et al.* 1998). Some of these contaminants enter the food-web and some get deposited to the sediments where they can remain buried (Laws 1981; Ikingura and Mutakyahwa 1997). However, most complaints by the users were about Uganda Leather and Tanning Industry (ULATI), and this was mainly because of the pungent smell associated with leather processing; but not the dangerous chemical pollutants.

Leather manufacturing industry not only pollutes the air but also the rest of the environment with harsh toxic chemicals. Substances used in the manufacture of leather include: lime, sodium sulphate solution, emulsifiers, non-solvent de-greasing agents, salts, formic acid, sulphuric acid, chromium sulphate salts, lead zinc, formaldehyde, fats, alcohol, sodium bicarbonate, dyes, resin binders, waxes, coal tar derivatives and cyanide based finishes (U.S. EPA 1982). Tannery effluent also contains large amounts of other pollutants such as proteins, hair and salt.

Steel Rolling Industry was also a major source of chemical pollution of the wetland. The production of steel causes water, air and noise pollution generates of hazardous

waste. Other institutional users discharging their wastewater into the wetland included fish factories, oil depots and industries located outside the wetland. National Water and Sewerage Corporation through leakage of pipes carrying municipal and industrial effluents and overflow of the effluent during rains might contaminate the environment with both chemicals and bacterial loads.

Risks for Potential Exposure to Chemical and Biological Contaminants by Men and Women Utilizing Kirinya Wetland and an Assessment of Such Knowledge

Overall, results from this study indicated that there was lack of awareness of chemical pollution in the environment and consequently lack of awareness of the risks associated with it. Biological contamination was appreciated more compared to chemical contamination. It is important to note that chemical elements have a wide array of industrial applications and thus provide huge benefits but also pose health and environmental risks to mankind. For example exposure to relatively high levels of inorganic mercury salts and methyl mercury can cause kidney damage, numbness or tingling in the extremities, sensory losses and loss of coordination in humans (Laws 1981). The resultant pollution also causes a negative impact on biodiversity, with consequent degradation of ecosystem resources and reduction in the incomes of stakeholders who depend on the ecosystem for their livelihood such as fishing, collection of medicinal plants and tourism.

Both women and men are at risk of getting exposed to chemical and biological contaminants through water contact practices. For example, women members of JUWWO were contracted by Jinja Municipal Council to maintain a drainage channel called the Malaria Sanitation Drain. This drain stretches for a distance of approximately 1.4 km and carries industrial and domestic effluent from several residential areas in the outskirts of Jinja Municipality through the urban centres of Jinja and pours into the wetland before emptying into Lake Victoria. People in charge of maintaining the above sanitation drain, rice growers and fishermen, who work in a wet environment in this wetland on a daily basis, were at a high risk of getting exposed to chemical and biological contaminants. Cultivators of crops other than rice can also get exposed to contaminants through coming into contact with a wet environment during the rainy seasons.

NWSC uses a series of ponds to naturally stripe domestic and industrial effluent of toxins before discharging the effluent into Lake Victoria. There were gardens and homesteads in close proximity to NWSC treatments ponds. When it rained the ponds filled up and the overflow drained into the nearby gardens contaminating such sites with chemical and biological contaminants. Fish factories are also likely to introduce biological contaminants into the environment through the discharge of their effluent.

Close proximity of residential areas to contaminated sites and / or vector-breeding sites puts women and children more at risk of getting exposed to chemical and biological contaminants; since they spend working in the field or at home. Given their

reproductive roles, women are less mobile and tend to be more active around the household (Flintan 2003). Pregnant women and children are especially vulnerable to effects due to chemicals and vector bites, because their weakened and or underdeveloped immune systems (UNICEF 1998), and these were classified as risk groups by the WHO. These gender groups get exposed to chemical and biological contaminants through direct contact with the contaminants in the environment. They also get exposed to biological contaminants through vector bites, and the bites could be frequent because of proximity.

Lack of access to safe drinking water and sanitation facilities was a risk factor to all gender groups. However, women and children, who stay at home throughout the day, were more at risk of getting exposed to chemical and biological contaminants through this mechanism. Given their nurturing roles, it is the women who are responsible for fetching water in the homes and keeping the homesteads clean. In a bid to provide safer drinking water and a clean environment to their families, they are engaged in collecting scarce resources such as water from alternative sites and this situation predisposes them to additional risks of exposure to undesirable chemicals and biological agents of disease (Francis and Jahn 2001; Flintan 2003).

Lack of access to safe drinking water and proper sanitation facilities cause the homesteads and the surrounding environment to become filthy. Women were particularly affected by filthy homesteads because they were the ones responsible for household sanitation and waste disposal. In a bid to maintain the hygiene and provide the family with clean water, the workload of women and girls is increased. Francis and Jahn (2001) argued that increasing women and girl's workload often placed severe stress on their health and their capacity to take advantage of education and training opportunities. This could explain why women encountered in this study were relatively less knowledgeable than men about activities that were the main causes of degradation of the environment.

Access and Control of Wetland Resources as Mentioned by Women and Men

The study revealed that the implementers of the law were mainly men, with a marginal women presence. Despite the existence of national gender and wetland policies in Uganda concerning gender equality in access to and control over of natural resources (wetland resources inclusive), there were no indication that these policies have been implemented. Gender inequalities continue to exist in the access and control of wetland resources in the study area. For example, the LCI administrative structure was of primary interest to this study focused on wetland resource users at village level. The LCI comprised of ten members i.e. chairperson, vice chairperson, secretary for defence, secretary for environment, secretary for finance, secretary for women, secretary for people with disability, secretary for youth, secretary for information and general secretary. The municipal environment officer and seven of the members of LCI were men. Only three women were directly involved in

administration, implying that the management level was not gender-balanced, as it was dominated by men. The overall administrative powers were with the men.

Every Ugandan citizen is free to access the wetland resources as long as he/she keeps within a proper procedure of access as stipulated by the local authority. Wetland resources in Uganda belong to government; users are required to lease plots from government. Wetlands are held in trust for the people of Uganda and are constitutionally protected and reserved for the common good of all citizens. Government has instituted a clear set of laws and regulations that govern the use of wetland resources. This involved transfer of authority from the centre to local government councils who were entrusted to ensure sustainable use through enactment of by-laws and application of regulatory procedures. In the past, use of Kirinya wetland and all other wetlands in Uganda was on first-come first-served basis, but from 1997 to date urban wetlands in Jinja have been controlled and managed by the Jinja Municipal Council (JMC) in collaboration with the respective custodians.

The study revealed that most users initially accessed the wetland resource through their colleagues already utilizing the resource. The custodian then goes after them to register through proper channels described above. However, it was evident that more women sought permission to use the wetland resource from the appropriate authorities compared to men. This was because women, in addition to respecting the law, also respected the management team; but many men were disrespectful to management. Men were disrespectful because the management team / custodian of the wetland was an organization managed by women.

It was noted that Jinja was the only district in Uganda that has locally instituted by-laws in place to manage wetlands in the district, known as the Jinja (Wetland Resources Management) by-Laws, 2000 and formulated jointly by the various stakeholders. The stakeholders included representatives from Jinja Municipal Council, the wetland head office, the Fisheries Resources Research Institute and local users. The objectives of the by-laws were to facilitate and permit sustainable use of the wetlands. The by-laws were implemented by a wetland custodian. The wetland custodian was appointed by the municipal council from among the existing users of the wetland for a period of five years and the appointment could be renewed depending on performance. The wetland custodian in partnership with the environment committee ensured that the objectives of the by-laws were achieved. Since the inception of the by-laws (i.e. six years ago) to date, the Jinja Urban Women Wetland Organization (JUWWO) has been the wetland custodian. JUWWO was entrusted as the wetland custodian because of the organization's effort towards sustainable use of the wetlands in Jinja district and their active participation in the process of formulating the by-laws.

JUWWO was a product of the partnership between Jinja Municipal Council (JMC) and the Fisheries Resources Research Institute (FIRRI) following research carried out by FIRRI, which indicated that poor women might be the main gender group

responsible for the degradation of urban wetlands. In a bid to sensitize the people, a partnership was formed between the researchers (FIRRI) and the municipal administrators (JMC).

Management and Conservation of Kirinya Wetland by Women and Men at Individual and Group Level

Results on wetland conservation revealed clear distinction between men's and women's effort towards sustainable wetland management with women typically displaying higher levels of wetland degradation concern and behavioural adjustments to obeying laws both new and old, relative to men. These findings were in agreement with those of Hunter *et al.* (2004) who, during their review on cross-national gender variation in environmental behaviours, discovered that there was a modest distinction between men and women concerning the environment, with women displaying higher levels of environmental concern and behavioural adjustments relative to men.

It was noted that men were good at memorizing the laws, and when asked about the individual efforts towards sustainable management of the wetland, they were quick at stating the bylaws but field observations and focus group discussions revealed that more women than men actually adopted conservation practices at individual level.

At group level, women were taking a leading role in Kirinya wetland conservation through JUWWO. This agreed with Flintan (2003), who mentioned that women, rather than men, tended to be more willing to form cooperatives and self-mobilize as a group to share responsibilities, provide support, and even to initiate change. In Jinja, for example, women through JUWWO were contracted by the municipality to maintain the malaria sanitation drain; in addition to its responsibility as the custodian for Jinja urban wetlands. However JUWWO faced a lot of challenges especially from men who had no respect to JUWWO as an organizational and frequently refused to abide by the regulations governing wetland resources.

This agreed with Flintan (2003) who stated that "though women associations offer good opportunities as a foundation for more formal institutions that could be involved in conservation activities and provide space for a focus on women's interests and needs, their contribution has yet to be fully recognized and utilized". JUWWO as a women organization is facing the same challenges. Flintan (2003) further urges that men can prove resistant to women's participation in conservation and development because men may feel threatened or concerned those women's domestic roles and responsibilities may be neglected if they take part.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Gender and environmental awareness was found lacking among the study groups including wetland and environment management officials. Likewise, awareness of chemical contamination in the environment was found lacking among the men and women utilizing the wetland resource. Consequently the people were not aware of the risks and effects of exposure to chemical contaminants. In addition the level of awareness of women on wetland degradation in general and degradation with chemical contaminants in particular was lower than men.

The main users of Kirinya wetland were women and men whose main activity in the wetland was crop farming, mainly carried out by women. The majority of women and men were engaged in agriculture for the benefit of both food and income as compared to food alone and income alone; more women than men farmed for food alone, and more men than women farmed for income alone.

In as far as pollution the environment with chemicals was concerned, individual male or female activities' inputs were minimal. Instead it was the activities that were carried out by institutional users that were polluting the wetland with chemicals. These users included industries and factories as well as fuel depots, located within the wetland. On the other hand, it was the urban poor that utilize the wetland resources who were exposed to a range of environmental pollutants, such as industrial wastes, toxic chemicals, air pollution and biological pollutants, derived from inadequate water, effluent and garbage disposal, poor sanitation and drainage services.

The study revealed that the implementers of the law were mainly men, with a marginal women presence. There were efforts to control wetland use for sustainability and the women took the lead in this aspect, both at individual level through obeying the by-laws and at group level through JUWWO.

Recommendations

There was need to create gender and environmental awareness among the wetland and environmental management officials, among men and women users and institutional users of Kirinya wetland. This would ensure gender equity in access to, control over and conservation of the wetland resource. There was also need to educate the men and women users of Kirinya wetland about chemical contaminants and their effects. Accordingly, environmental monitoring packages should be put in the strategic plan to ensure sustainable utilization.

Behavioural changes and commitment among the men and women users of Kirinya wetland were required; these were expected to lead to enhanced involvement of youth (girls and boys) in wetland management practices, to improved involvement in the identification of environmental degraders and to subsequently report them to the respective authorities, and to proper sanitation and hygiene practices.

There was need for thorough assessments of institutional use of wetlands as these were identified as the main degraders of the wetland with chemicals. Industries and factories should be pressed hard to comply with the existing environmental regulations and legal redress should be taken against environmental polluters; efforts should also be made to ensure proper disposal of effluent.

Further research was required to conduct a thorough assessment and inventory of the chemical composition of the different effluents being discharged into the wetland. Further studies were also needed to explore risk factors and identify relative risks of exposure to contaminate. Future studies should also consider other surrounding communities that utilise the wetland, other than those within the vicinity of the wetland.

Formulation of a comprehensive management plan for the wetland was required; and this should include a list of legal investments that shouldn't be established within the Kirinya wetland. The Wetland Inspection Division should provide the technical and financial support to JUWVO to develop the said Management Plan.

Alternative sources of income need to be identified and investments made and put to the benefit of low income earners so as to reduce encroachment of the wetland. This study recommends that Jinja Municipal officials follow up the Poverty Alleviation Fund allocated to environmental management, and in addition look up alternative sources of funding to facilitate the municipal wetland conservation programmes.

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Chapter Six

Integration of Gender Issues in Wetland Clariid Fish Production and Acquisition of Technology for their Breeding in the Lake Victoria Basin

Justus Rutaisire, Consolata Kabenesa, John K. Okechi and Pricilla N. Boera

BACKGROUND

This research undertaking complimented an ongoing project titled "*Development and dissemination of appropriate breeding technologies for wetland clariid fishes in the Lake Victoria basin, East Africa*" that addressed important technological gaps in the development and dissemination of breeding technologies of Clariid fishes. However the then ongoing project did not address social and gender relations and linkages in the community with the resources in the development and dissemination of the said technologies.

Of recent, the need to understand the farmers/community's interests and aspirations is taking a centre stage in agricultural project formulation, implementation and monitoring. Such knowledge could only be gained by examining the socio-cultural environment in rural communities and understanding how they derive their livelihood. This entails analyzing farm labour, household dynamics in decision making, policies, gender auditing and generally viewing rural development in a gender lens (Akello and Sarr 1999). Literature indicates gender disparities in value for labour income, access and control over resources in many communities in Uganda (FAO 1999; Akello and Sarr 1999). This is an impediment to socio-economic development and improved livelihoods, since it denies women who are half of the population essential means of production.

Traditional inequities among the communities as regards gender relations needed to be fully understood so that technology recipients are the real and not the perceived users. Therefore the study was intended to investigate the situation as it pertains to aquaculture in general and utilization of wetland clarified fishes in particular, and to generate information and propose methods for integration of the gender issues in wetland clariid fish production and acquisition of technology for their breeding in the Lake Victoria basin.

OBJECTIVES AND STUDY CONCEPTUAL AND THEORETICAL FRAMEWORK

Objectives

The overall objective was to establish methods through which gender issues may be integrated in aquaculture in general and wetland clariid fish production in particular. The specific objectives include, (i) collecting gender disaggregated data on aquaculture production and utilisation in the Lake Victoria basin; (ii) to ascertain modes of decision-making and control over benefits from aquaculture among the riparian communities; and (iii) to develop socially acceptable and gender sensitive approaches for developing, training and transfer of aquaculture technologies.

Conceptual and Theoretical Framework

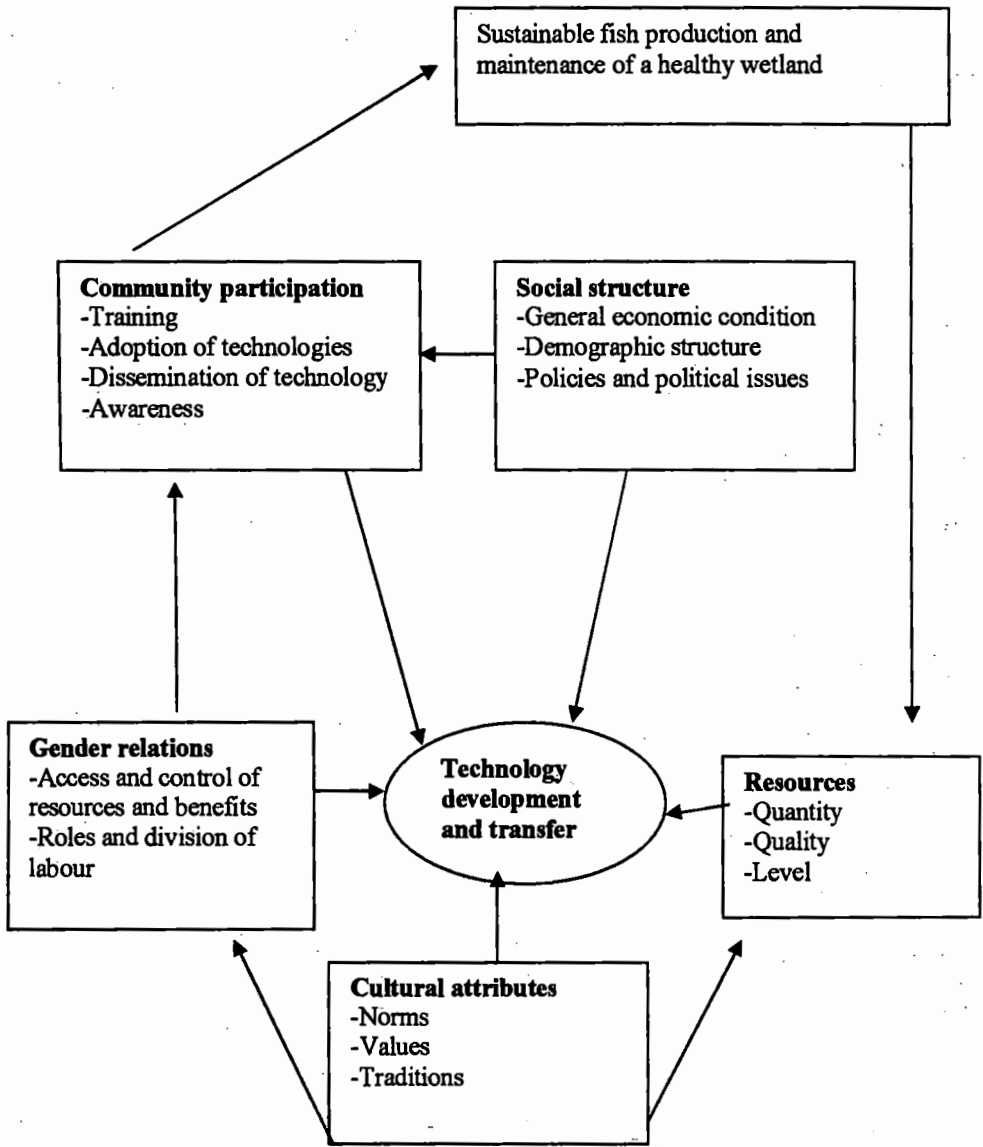
The project was conceived within the general gender role framework, first developed by researchers at the Harvard Institute of International Development in collaboration with the Women in Development Office of the USAID. This framework identifies gender-based divisions in productive and reproductive work and gender differences in access to and control over resources. In this project considerations were given also to other social differences such as age, marital status occupation, education levels that might influence access to and utilisation of resources. This study was intended to collect disaggregated data on utilisation of cultured fishes and incorporate social issues in the proposed dissemination of breeding technologies for sustainability; since technology transfer should be to actual users and ultimate beneficiaries within the community. A conceptual model of the study is outlined below (Figure 1).

METHODOLOGY

Research Design and Sampling

The study area comprised three districts in the central part of Uganda namely Kampala, Mukono and Wakiso. Emphasis was placed on collecting data on methods through which gender may be integrated in aquaculture production and utilisation through the use of various qualitative and quantitative techniques. It also looked at the accessibility to resources required in the production of cultured fishes in the community. Additionally assessment of the modes of decision making and control over benefits from aquaculture were analysed. An attempt was also made to find out ways through which socially acceptable and gender-sensitive approaches for training and transfer of technology could be developed and at the same time socio ecosystem relation in aquaculture could be defined.

Figure 1. Conceptual and theoretical framework



A cross sectional study approach was utilized comprising of 60 respondents that were drawn from sampling frames obtained from local government fisheries officers in various districts, each district contributing twenty respondents. An effort was made to ensure that the sample comprised of all gender respondents. Simple random and systematic random sampling techniques were employed in various areas. Eight farmers were used in the pre-testing of the research tool. In Mukono and Wakiso districts, systemic and random sampling techniques were used, given the diversity of the coverage of the area and the large number of farmers involved in the activity. However, snowball sampling was also used at particular areas in instances such as where the farmer was absent because of some personal reasons, or inaccessible due to inaccuracy of the lists, or in cases where the farmer may have shifted from the area or abandoned the activity in a period of less than three years. This sampling design was selected because it would involve a broad sampling of persons different in age, income, and education. The advantage is its ability to obtain varying information from different groups of people (Bailey 1994).

The primary sources of data were the fish farmers practicing the activity as well as those who had abandoned this means of livelihood. The farmers being the key unit of analysis, their voices and views were taken into special consideration in understanding the dynamics of fish farming. By using three selected districts along the shore of Lake Victoria basin (Uganda), the study ensured good understanding of social issues by means of qualitative and descriptive data. Some of the tools used were semi-structured which ensured that the voices of the farmers were captured in addition to the focus group discussions.

A wide range of data collection techniques were used to ensure validity, reliability and comprehensiveness. These included: focus group discussions, semi-structured interviews, observation, document reviews and key informant interviews; these were supplemented by other methods including questionnaires. Fish farmers were the primary sources of information complimented by fisheries officers, government reports, media reports and other literature on aquaculture.

This being an interactive project between the community and the researchers, there was need for greater understanding of the social environment, openness and patience. A rapport was established by timely introduction of the researchers to the community, explaining the study, listening to the respondents, explaining and discussing the results with the stakeholders. Community involvement was central to the management of the research project. Community participation permitted a better technology fit with the fish farming systems; also built within this system was the flexibility to adjust technology to suit user needs

Triangulation as a method was employed in order to enhance reliability of data. Triangulation is a concept borrowed from surveying where it is used as a method of improving accuracy of findings. It was felt that it could be applied in social research, where it would imply the use of multiple and different sources of methods,

investigators or theories (Denzin 1988 cited in Leahey 2007). Many writers have adopted the description triangulation as the use of multiple measures, data sources, methods, tools and people (Wilde 2001). It is often used as a way to crosscheck information for accuracy and reliability.

Data analysis

The study generated a variety of data, which included verbatim notes, transcribed recordings of interviews or focus groups, jotted notes and "field notes" of observational research and the researcher's reflective notes made during the research. In some instances data analysis was done alongside data collection to allow questions to be refined and new avenues of inquiry developed. This being a cross-sectional study involving qualitative and quantitative methods of data collection, crosschecking of information by different stakeholders was an integral component of the research process. Information was generated from different categories of members of the community, grouped on the basis of gender comprising of fish biologists, aquaculture practitioners, educator, and socio-economists.

Qualitative data was in textual form, and "indexed" to generate or develop analytical categories and theoretical explanations. These analytical categories were used to describe and explain social phenomena. Each item in the data was checked or compared with the rest of the data to establish consistency. The data were indexed, rearranged according to the appropriate part of the thematic framework to which they relate. The data were also organized in form of themes sought with a view to providing explanations for the findings. Computer software SPSS VERSION 10.0 was used to analyze qualitative data.

FINDINGS

Characteristics of sample population

The total number of respondents was 60, however only 52 people (72.5%) men and the rest (27.5%) women made up the sample population. The sampled fish farmers had an average age of 48.8 ± 14.7 years; men had a mean age of 50.9 ± 14.9 years, while women fish farmers were relatively younger than their male counterparts with a mean age of 45.2 ± 12.6 years. No significant difference in age was observed between the two gender categories.

The majority of the fish farmers were educated. Many of the respondents had attained Ordinary level of school education. It was observed that a significant number of the respondents ($\chi^2 = 10.113$, $df = 4$, $P = 0.039$) had dropped out of school after reaching secondary education. Most farmers dropped out of school at Ordinary level (O-level) as compared to primary level. This was mainly attributed to failure in obtaining fees required for secondary school education, especially for girls.

Educating females was considered a waste of resources by many. The famous Indian saying that educating a woman is like watering a flower plant in another man's compound applied in the study area as well. The proportion of female fish farmers decreased as one progressed through to higher educational levels. For instance of all those who had attained university education only 7.7% were women as compared to men (92.3%), and has greatly impacted on aquaculture practitioners as a whole, and women in particular (UNIFEM 1993).

Marital status, Household and Occupation

In the present study a highly significant ($\chi^2 = 42.706$, $df = 2$, $P < 0.001$) number of the respondents in both gender categories (76.6%) were married. Half of women in this study were married and the rest were either single or widowed; a high proportion of women were widows (41.7%). A low level of significance ($\chi^2 = 12.845$, $df = 2$, $P = 0.002$) was observed between marital status and gender of fish farmers. The number of men who were not married (66.7%) was high compared to women (33.3%). It was further observed that there were more women in the widowed category (83.3%) compared with men (16.7%).

A significantly high percent (78%) of fish farmers were reported to head their households ($\chi^2 = 15.680$, $df = 1$, $P = 0.001$). Of these 81.6% were men and the rest women. The mean house hold size was 9.00 ± 4.04 with the number of people per household ranging from 4 to 23. Male-headed households were larger than female-headed ones, 9.24 ± 4.36 and 8.33 ± 3.28 , respectively. However, no significant difference was observed between the two gender categories.

A significant difference was observed between adults and children below eighteen years of age ($t = -2.528$, $df = 44$, $P = 0.015$) in engagement in fish farming. Children who made up over 60% of the household had low contribution to fish farming. A significant high number of fish farmers ($\chi^2 = 75.585$, $df = 7$, $P < 0.001$) were found to be full time farmers (51%), engaged in agricultural and livestock rearing. Nevertheless no significant relationship ($P > 0.05$) was observed between gender category and major occupation.

Taking farming as a whole, fish farming was often a secondary activity in relation to other agricultural engagements. The main occupation of fish farmers varied widely, and comprised farmers (51 %), civil servants (15.7%), business men/women (11.8%), housewives (5.9%), fisheries officers (2%), nuns (2%) and others (7.8%). When respondents were arranged by gender category within occupation, over 60% of the fish farmers were engaged in agriculture as a major activity were men, and the rest (40%) were women.

Fish Farming/Production

Fish farming was being taken up as a major activity to improve household income and provide employment, and this was corroborated by the present findings. About 50% of

those involved with the activity considered it an important enterprise. However, fish farming activity was relatively new in the study area. On average fish farmers had been practicing for about 4 years. No significant difference was observed between men and women *vis a vis* duration of the practice. This implied that the activity had been equally embraced by men and women; despite the fact relatively more male-headed households were more involved in fish production (76.5%). Other findings have also revealed that fish production was situated in the male domain, but relied on the women and the family to finish it off (Goeetz 1978 cited in Madanda 2003). Lack of access to production resources and other necessary requirements such as information on the production methods generally impacted on aquaculture production, and in some cases led to abandonment of the activity due to poor returns or low quality output.

A significant number of farmers ($\chi^2 = 9.308$, $df = 1$, $P = 0.002$, 71.2%), predominantly men, reported to have been getting information on fish farming, mainly from extension officers who visited their fish farms on regular basis. The majority of the fish farmers (79.6%) did not get any extension services from the National Agricultural Development Advisory Services (NAADS), and those who received such services claimed that the information did not include fisheries advice. Primarily men received such information, 71.4% and 28.6% of men and women fish farmers, respectively. Likewise more men (78.6%) reported to have received extension services compared to only 21.4 % of women. Information on fish production was obtained from various sources with the key sources being government and district fisheries officers, development partners such as NGOs, farmer groups and friends.

Less than 50% of the fish farmers had some sort of training related to fish farming, despite the fact that farmers were enthusiastic to get training in fish farming techniques. Both male and female participants indicated the desire to attend training in any fish farming activity.

Utilisation of Clariid fish

Aquaculture development in most of African countries primarily has social objectives such as nutrition improvement in rural households, generation of supplementary incomes, diversification of activities and incomes, and creation of employment especially in rural communities where opportunities for economic activities are limited (FAO 2003). This corresponds with the present findings, where the majority of farmers carried out fish culture activities to fulfil their social obligations such as improving household income, providing food for home consumption and alternatives to proteins sources, putting idle resources to use, and fighting poverty. Majority of the farmers were motivated to begin fish farming mainly to increase household income, food security and to circumvent limited availability of resources like land. Household income ranked highest among the motives for carrying out fish farming in both gender categories; 59.5% of men and 38.5% of women were motivated through improvement of their income. Improving household food security seemed crosscutting across

gender, since both men and women contended that fish farming was useful in improvement of household food security. In the study locality, both males and females were culturally allowed to consume fish; there was no gender related impediment to eating fish.

Control over proceeds

Of all fish farmers interviewed in this study, many (65.4%) revealed that income obtained from pond fish was kept by the household head ($\chi^2 = 6408$, $df = 4$, $P = 0.001$). The majority of household heads (72%) decided on how money obtained from sales of pond fish was to be spent. In male headed households, both men and women participated equally in fish farming but control over proceeds was a prerogative of men. Findings by Oxfam indicated that women's role in fish farming and their control over incomes varied widely (Oxfam 1995 cited in Madanda 2003).

There was a trend where many rural communities preferred selling off or hiring out the wetland to growers of swamp crops such as rice and yams. It was discovered that as many as 66.6% of men and 33.3% of women claimed to have adopted fish farming as a means with which wetland may be made productive. Aquaculture is essentially an agricultural activity, competing with other agriculture enterprises for the same basic inputs (land, water, labour, nutrients) and forming part of the farm resource cycle (FAO 2003).

Types of inputs needed by fish farming

Of the farm inputs listed by fish farmers; labour, feeds, farm implements and capital were the most frequently mentioned needs by the farmers. Fish feed took precedence over all other needs; when analyzed by gender category however, labour was found to be the most needed fish farm input. It was found that 54.3% of the men and 58.3% women respondents needed labour input for their fish farms; no one expressed need for farm implements, capital and fish seed as high ranking farm inputs needs.

On the whole the farm sizes were small, averaging $2762.3 \pm 6526.3\text{m}^2$ for men and $1545.0 \pm 1523.4\text{m}^2$ for women; no significant difference was observed between the size of ponds owned by men and women ($P = 0.05$). Investments made on pond fish farming were limited and this may be attributed to high poverty levels among the farmers especially the women. The present study indicated that more women than men faced resource constraints; hence the reason why women spent less on aquaculture inputs compared with men.

Land

Land utilization

Findings revealed that swamps that were apparently regarded idle and unproductive land were put to good use by farmers. Prior to introduction of fish farming, many swampy lands were under utilized. A significant high number ($\chi^2 = 11.077$, $df = 1$, $P =$

0.001, 76%) of the respondents owned the land they were using for fish farming, more so for men (81.1%) than women (41.7%).

Pond ownership and management

It was observed that a significant number (96%) of fish farmers owned the fish ponds ($X^2 = 42.320$, $df = 1$, $P < 0.001$). All men reported to individually own their fish ponds, while 94.4 % of women owned the fish ponds mainly as groups. The number of ponds owned by men was significantly higher than those owned by women farmers (average for male 3.74 ± 3.43 ; 2 ± 1 for female farmers; U-test = 135, $P = 0.022$).

Capacity to sustain fish farming

In the present study 82.4% of the fish farmers reported that they were able to undertake fish farming; however, they cited some problems often faced in fish farming including predation, high cost of production, lack of feeds, lack of fish farming skills, limited capital, floods, and lack of market for their pond products, poor quality of fry, thefts, and lack of farm implements, poor transport, algal blooms, and low market price. Personal impediments included age and distance from the farm and market place; it appeared that these problems were shared by fish farmers as a whole irrespective of gender.

Since the poor, including women faced resource constraints, constraints; they were always advised to pool their resources together such as social capital, land, financial resources and labour (FAO 1997). Poor fish folks merge their limited resources to make a living. It is important to note that social capital was one of the most important assets in the rural settings that enabled the poor rural population to satisfy their needs.

Allocation of Labour

Farmers described fish farming as a labour intensive enterprise, and success required active involvement and commitment of the household heads as well as involvement of the rest of the household members. Many respondents claimed that family labour input was an essential component for success. In fact fish farming was often understood as a family business, and family members were involved in predation control, fry production, input purchase, slashing of weeds, marketing and water and pond management. Hired labour was an alternative that was sought after, when it came to the harder tasks such as pond construction. The family was the most important source of small scale fish farming labour, while hired labour was employed at community and commercial sites that involved large investments. Activities such as feeding, applying fertilizers and other necessary activities were in the domestic domain where women and children dominate while men mainly did harvesting and marketing.

Gender was not the most important premise for the division of labour among the fisher folk but rather other variables, especially ownership of the instruments of

production and distribution which in turn hinged on capital outlay were more crucial in determining the division of labour (Okwe 1994 cited in Madanda 2003).

Most of the fish farmers visited their fishponds in the early morning hours 8-10:00 am (24.7%) and late hours 4-6.00 pm (27.8%) of the day. Only 3.1% of the farmers were doing fish farming as a full time activity. This indicated that fish farming in Uganda, as noted elsewhere in Africa, was a temporary and supplementary activity for small-scale farmers, especially so for women (FAO 1994).

Fish extension services

The findings revealed that there was little technical support and monitoring from district or extension workers. Findings indicated that the extension agents rarely visited the farmers. This implied that information dissemination was poor. The study revealed that the farmers had little or no opportunity to be trained by government workers. This poor information flow had two main implications, either the farmers practiced fish farming in a traditional way or travelled long distances in search of information. The farmers reported that training and seminars in fish farming were irregular and in most cases the venues in which the seminars were organized were very far from home.

Farmers reported that lack of capital was one of the major hindering factors to aquaculture development. Capital was required to purchase inputs such as feeds, fertilizers and improve on farm output. The funds were required to expand the ponds and purchase equipment necessary for pond work. To harvest, for example, the farmers had to rely on either district/public facilities or borrowing because the nets required were unaffordable by many farmers.

Affordable methods such as use of hooks were not only time consuming, but also disadvantageous because often injured the fish. Poor farmers lacked gear such as nets. It was reported that farmers borrowed nets from neighbours who would not be using their equipment at night and utilized this window of opportunity and harvested fish by night; a practice that exposed the harvested fish to theft. In some instances fish farmers would hire labourers who might then paid visits to the ponds earlier than the owners and got away with the fish.

In general, fish farming has always been taken as an additional activity and given less priority compared to other farm activities. Support from the government and other partners were limited, only one NGO had come in to lend a hand, especially to the women's group. There was need to address these constraints, if the endeavours to reduce poverty through as fish farming, were to attain their intended goals.

The intensity and prevalence of constraints faced by both men and women were partly functions of the gender division of labour. A combination of these factors necessitated development of socially acceptable approaches for training and transferring of breeding technologies to the farmers. Constraints such as poor pond management,

diseases, fish predators, poor information delivery systems and generally failure to incorporate the voices of the disadvantaged have contributed to poor community based management of wetland resources. There was need to solve these problems in order to attain the goals of perceived development.

Harvesting and marketing

Because of the ease of harvesting while using nets, most fish farmers (79.3%) were using net seining as a method of fishing. Most fish farmers (86%) claimed that they found it easier to use nets even though they were aware of other methods of capturing fish from ponds. When farmers were categorized according to gender, the trend was similar, with more men (94.1%) than women (70%) finding it easy to harvest their fish using net.

Market for pond fish was reported as readily available by most (76.9%) fish farmers. Most fish farmers (67.3%) sold their fish to the local communities around the fish farm, while 19.2% sold their pond fish on pond sites. Very few farmers (9.6 %) had access to foreign markets i.e. D. R. Congo, and some used the fish produce solely for home consumption.

In cases where fish farming was a family enterprise, men had the sole responsibility of marketing, while in joint fish farming ventures; market related decisions were jointly made by the group; in situations where the group comprised of men and women, men alone made decisions.

It is important to note that the benefits observed in the groups/respondents differed with sex. In Uganda, gender ideology has created different spaces and inevitably has led to unequal distribution of economic benefit between sexes (Olinga, 2000). Whereas the males looked at benefits from the financial aspects, female respondents viewed them from social aspects, i.e. nutritional improvements and social interaction.

Overall, the majority of fish farmers (94.1%) used part of the harvest from their ponds for family meals. It was reported that 11.1% of the farmers ate fish once a week, while some (22.2%) ate fish whenever they felt like eating fish; a similar number (22.2%) claimed that they ate fish after every harvest only.

The over-riding concern why farmers were engaged in fish farming was to come out of poverty; but most have failed to do so. Income from fish farming has remained generally low, but non-cash benefits were perceived to be high, which included provision of fish protein, land utilization, knowledge and experience acquisition; and improved social interaction.

DISCUSSION

The relationships between gender and the aquaculture development in Uganda were clearly complex, while some dimensions of this interaction was documented the underlying differences regarding fish farming resource access and control and the

actual demographic characterizes including age, education levels, marital status, household size and other occupations have not been given much attention. The findings revealed various modes of decision-making over benefits from culture and capture fisheries. The activity was dominated by men who comprised the greatest proportion of the fish farmers in most communities in the area. Studies done elsewhere had indicated that fish farming in Africa was seen as a male activity while pond management was carried out by their spouses (FAO 1994).

The study clearly indicated there was an educational disparity between males and females that comprise the fishing community. This was serious underlying consequences for women who are involved in fish farming. The findings further indicated that the gap grew wider at the higher levels. African culture in general offered male children greater opportunities to education and in life than the female counterparts. Often in Africa, parents are not willing to invest in education of the girl child which they consider a gamble with their wealth. The gender implication for limited education means women may not benefit much from any development interventions in technology driven sectors such as aquaculture. This has far deeper ramifications since women were relatively more involved than men with small-scale fish farming (UNIFEM 1993).

In African communities it is uncommon to remain unmarried because marriage is an institution that gives one an important social identity. It is commonly understood that marriage is the most important institution to the extent that resource access and control is much dependant on marital status. African culture offers women and men different opportunities oriented towards their ascribed gender roles in life. For instance the Turkana in Northern Kenya have culturally presented the males with more privileges with the assumption that they will become warriors and defenders of their families, while for the women, marriage was seen as the ultimate end. Resource allocation in Africa and Sub-Saharan Africa region is more in the male domain and women's access to these resources is dependent on their kinship relations such as blood relatives and marriage (O'Connell 1994). The implication for the single women is that they are socially isolated and under considerable stress than their male colleagues in the same category. It was therefore not surprising that married individuals had greater opportunities to take on fish farming as compared to non-married ones.

Historically men have been accepted as heads of the household even where women are obviously in control; it is hushed up and the man must be seen in-charge. A general pattern of ownership of the family property and authority in Africa is vested in the head of households who is almost invariably classified as a man; even in cases where he is not physically present at home (Rogers 1980). With regards to fish farming the male head was responsible for activities such as control over the entire proceeds. However, with more women having access to education, many female-headed households were being established (O'Connell 1994). This trend was seen in

the present study where the number of female-headed households was 18.4%. In spite of this development, the position of women has not changed much with regard to household decision making.

Male headed households were relatively bigger in number as compared to female-headed ones. According to O'Connell (1994) this was due to various reasons, such as orphan and widow inheritances which usually put the responsibility on the male household head. The other reason was polygamy which was a cultural practice that encourages men to have more than one wife. Much of Africa was dominated by almost similar cultural practices such as polygamy, widow and orphan inheritance, and Uganda is no exception. Polygamy results in more children and consequently bigger household size.

Aquaculture is currently one of the fastest growing food production systems in the world but its introduction to Africa and Sub-Saharan Africa, in particular, is relatively new; it is commonplace in Asia (FAO 1997). In the present study location, fish farming was considered a new venture to improve household food security and considered as an alternative source of income; and both genders have equally embraced the activity.

Aquaculture production in Uganda and other African countries was still low; and this was attributed to lack of essential factors of production such as information. Brugere *et al.* (2001) have pointed out that the limited access to production information has curtailed the growth of aquaculture. Local studies NARO in (2000) also indicated that aquaculture had not reached its potential. This was attributed to lack of information on the development of various aspects of aquaculture sector.

At individual level, there was a widespread disparity in access to information between the commercial farmers and subsistence poor farmers. This was so because of attitudinal problem by the extension agents towards poor farmers. The disparity between gender categories as regards access to information on new technologies was tilted in favour of male farmers. Studies indicated that government-aided extension agents tended to predominately target men on the assumption that they would pass on the information to their wives. This was a source of problem especially when it came to feeding and management of pond, since it was the wives responsibility to do so. This has led to low productivity as reported by farmers in the present study. Earlier findings showed that lack of production information was responsible for the poor returns and low quality outputs which placed the poor farmers, including the women, at a disadvantage (FAO 1994).

The Farmers that were caught up in this situation opted for other sources of information, e.g. from business communities, community-based organs, friends as well as well wishers such as researchers who are not gender biased. Availability of such information was primarily attributed to involvement of gender-sensitive NGO's.

Women in every community perform roles that encompass productive, reproductive and community roles. Included among these roles are community development, improving food security and creating alternatives for increasing household incomes. Men and women in every society were allocated different roles; however gender role allocation favoured men. According to Madanda (2003), paid lucrative activities have been allocated to men, while the women participate in the reproductive and community roles.

Providing homes with food and alternative sources of protein was another reason why many farmers were involved in fish farming; hence the reason why the activity was considered a family enterprise. Nutritious food stuff, such as fish, was not commonly available, because the price of fish in the market was unaffordable by local communities. This was attributed to undesirable ecological changes that had taken place in Lake Victoria. Expansion of fish farming practices should be encouraged as a means of addressing the gap created by inadequate fish supply.

Aquaculture development in most of the African countries has had primarily social goals, such as community development and nutrition improvement. Of recent, the economic objectives have been included on the agenda such as generation of supplementary income, diversification of production activities and creation of employment especially in rural communities, where opportunities for economic activities are limited (FAO 1994).

In male-headed households, both men and women participated equally in fish farming but control of proceeds was a prerogative of men. Other findings obtained by Oxfam have indicated that women's role in fish farming and their control over incomes varied widely (Oxfam 1995 cited in Madanda 2003).

Fish farming like any other production system involved a complex division of labour and social relations that entailed differential ownership of property and social status. Gender ideology definition of specific space for women and men in the society has thus allocated women the bulk of unpaid family and community work, while the men do tasks that are considered productive and remunerated (Madanda 2003). Women have not benefited from development and other initiative processes because of their limited authority in the household to decide on vital issues concerning them. Similarly in Cambodia, Thailand and China, women often bear the sole responsibility for aquaculture production because of male migration to cities (Brugere *et al.* 2001), a similar situation prevailed in most African societies, including Uganda.

As regards inputs other than labour, it was found that essential feeds, fertilizers and the fish seeds were obtained by purchase and from local sources. Commonly used feeds included maize bran, cotton seed cake, and mukene fish (*Rastrineobola argentea*) which were readily available in the trading centres and local shops. Locally obtained feeds were from nature and the farmer's homes and farms. Common feeds included yam leaves, several other leafy materials and food remains from the farmer's

homes; while the fertilizer included artificial and local available organic fertilizers such as cow dung, poultry waste and brew waste. It was noticeable from the area of study that most ponds were new and access for supply of fish seeds depended on various sources. In periods of feed and fertilizer shortage, there was need for purchase of inputs which may be a disadvantage to women since they usually have less capital compared with men.

Findings from this study indicated relationship between resource ownership and marital status/marriage. Women who owned land and fishponds were either widowed or *de facto* household heads. Land rights continue to be given to male household heads. Ownership and utilization of land in Africa are governed by patriarchal ideologies. Sub-Saharan Africa governments, including Uganda, have replicated the status quo of favouring male ownership of land towards female farmers. In the present study it was found that women had little control over land and other productive resources. On the other hand male farmers owned the land where the ponds were constructed. The poor, including women, acquired the land and other resources through rent or seeking permission from the family heads that were usually male kin. It is commonly understood that women's ability to gain access to resources within a rural household or community was dependant on kinship systems, marital status and motherhood.

The findings from national surveys have indicated that despite the redrafting of the constitution in 1995, women's situation with regards to ownership of land was still problematic. It is commonly known that in Uganda and rural areas in particular, gender relations with regards to ownership of resources are dependant on kinship structures. Men had a clear advantage over women in access to, and control over resources. Cultural practices related to land dictated that while the women can access land through their relations with a father, husband or brother in most Ugandan communities, women did not own land. This implied that women had to obtain permission from their husbands or male relatives on usage of land. This was so because much of Africa and Uganda in particular was still governed by customs that evoke the same control over women's productive and reproductive labour (O'Connell 1994)

Problematic access and control over these resources was not limited to on family or personal land but permeates the whole idea on access to and control over resources. It had been reported that women's limited access to and control over resources was a kind of marginalization internalized in cultural ideology which had given men an effective control over productive asserts (WHO 1995 cited in Bukokhe 2004). Male as compared to female farmers had more control over issues concerning land as a major factor in fish farming. In the present study it was found that the underprivileged obtained access to land for fish farming through renting for a specified period or mutual partnership such as forming partnerships with an individual who owned land.

To maximize the profit from land (rented or otherwise), women combined fish farming with other activities. Findings indicated that fish farmers were found to be involved in other farming activities which included crop plantation, for example sugar cane, maize and banana growing among others. Livestock production was also mentioned (poultry, dairy cattle, goats and piggery); other activities included clay mining, biogas production and forestry/agro forestry. More than 54% of women fish farmers were carrying out crop production concurrently, while 36.5% had livestock as another additional farming activity. It was further observed that among men 79.4% were engaged in crop production compared to 60% among women.

Fish farming employed a complex mode of division of labour. Women were mostly involved in small-scale fish farming (UNIFEM 1993); women more than men provided labour in subsistence aquaculture, while the males owned the factors of production including control over household labour (FAO 1994). In the present study it was noted that women played an active role in pond management as well as the well-being of the household. However women's contribution was often not given the importance it deserved. It was reported that whereas women's work was understood to be natural/ expected or at best light work, the gender relations and the likely implications under which women perform these rigid roles had not been addressed (WHO 1993 cited in Bukokhe 2004).

The idea that gender roles were natural ones was used in support of male ideology which sought to exclude women from many important areas of life. This was clearly revealed in the findings when the male respondents point out that:

"Fish farming is women's work as for us men we are busy in town... ..For us men when it comes to handling things like constructing the pond then you see us but those small activities like feeding, and simple things are in line with women's work so they do those ones." male farmer Wakiso District.

Since women generally face more resource constraints than men, it was often suggested that they should pool their scarce resources and be engaged in fish farming in groups. Studies carried out elsewhere had indicated this possibility. For instance, in Rwanda, fishponds were usually managed by several families because of scarcity of productive resources such as land and other inputs (FAO 1994).

A great majority of farmers who made up the study sample population pointed out a number of problems that were associated with fish farming. Some could be attributed to the fact that gender ideology plays a vital role in the distributive roles and processes of aquaculture. Constraints such as limited access to productive resources such as technologies, skill and knowledge disparities among the male and female farmers, failure of extension workers to reach the poor, poor technological transfer were seen to be ubiquitous. According to FAO (1994) the failures in development of socially acceptable and gender sensitive approaches to development of training and transferring of technologies on fish production has been attributed to the fact that

women and the poor were not reached at all. The assumptions that fish farmer husbands will pass on the information to their wives especially when it came to pond management did not work. In fact it had impeded aquaculture production and consequently transfers of technologies. This had been further attributed to the fact that women more than men participated in the more integral exercises necessary for fish survival (UNIFEM 1993).

It was generally observed that apart from fish farming, farmers were involved in other farming activities. Women in addition had other domestic chores such as cooking fetching water, collecting materials for craft that necessitated conservation of wetlands as a source of raw materials and for fish culture. It was noted that male related activities such as clay mining, agriculture, settlement implied destruction of the wetland ecosystem. However such degraded areas could be rehabilitated and used for fish farming, since this was one of the activities that were allowed within the framework of wetland management in Uganda.

CONCLUSIONS

Aquaculture is essentially an agricultural activity, competing with other agriculture enterprises for the same basic inputs (land, water, labour, nutrients) and forming part of the farm resource cycle. In Uganda, however, fish farming did not feature prominently among the most important agriculture enterprises such as cattle, goat keeping and poultry farming. Fish farming required resources that range from land, fertilizers, information and labour which most of the poor lack. In rural areas, access to such resources was determined by kinship ties. The gender division of labour is a social structure that when applied in its current form was a disadvantage for development of aquaculture. This should be addressed through inclusion of gender sensitive packages within aquaculture projects and programs.

If development projects were to be successful and beneficial to the entire community, they must recognize gender differences in tasks, traditionally done by men and women and their access to and control over inputs. Integration of gender issues in fish production and acquisition of technology for their breeding in the Lake Victoria basin means, aquaculture would improve in nutrition and address practical gender needs. With more control over aquaculture activities, strategic gender needs such as improvement in status, access and control over ownership of resources and lives will be enhanced.

It should be emphasized that the gender concerns, especially access to and control over resources, inputs, labour allocation, acquisition of fish farming technologies, as highlighted in the present study, and general realization of benefits from aquaculture are factual and must be sincerely addressed.

RECOMMENDATIONS

A number of national and international interventions have been put in place in pond fisheries with a fair amount of success but development of aquaculture has not reached its potential. One fundamental reason for this situation was the lack of information on the development of the various aspects of the aquaculture sector (NARO 2000). There was need for more intense gender based research to find out more on the needs and aspirations of fish folks including poor men and women. As a result of gender division of labour, women and men had different roles, needs and priorities; hence the need to understand the different roles and responsibilities of those involved in the various aspects of fish farming. It was therefore necessary to involve the main actors in aquaculture and assess the gender relations of men and women with regards to labour, income and the problems they face as community members.

There was also need to change approaches to development because aquaculture in Uganda was largely subjected to the law of subsistence rather than the law of value, in which the interests of the male head come before the household needs. It had been noted that the law of subsistence still permeated much of rural Africa (Himmelstrand 1994). There was need to design strategies that address the needs of the fish farmers in Uganda taking care of interest of all gender in order to take advantage of opportunities offered by government's Plan for Modernization of Agriculture.

The findings revealed that NGOs had better access to the poor and the underprivileged more so than government officials and agencies; and as such their efforts should be commended and emulated by government agencies. It is important that avenues that provide social capital be encouraged to help the generally under privileged to share in the benefits of development. It's expected that such groups shall give better opportunity for exchange and dissemination of information and facilitate easier access to institutional credits

There was need to involve women and enable them to elaborate the social, cultural and economic constraints that are involved in fish farming. This is important because findings indicated that women more than men contributed to small-scale aquaculture. It was apparent that women's activities could no longer be seen in isolation from the linkages that made up the production process (Kabeer 1994). Evidence assembled by the Economic Commission for Africa (ECA) had proved beyond doubt that when real life situations of women were not featured into policies and programs, development was impeded; and the situation grew worse in time rather than better. Women were not the only issue, both men and women must be lifted from poverty; both must contribute and benefit from development efforts.

There was need to educate and create awareness amongst the communities on the importance of proper management of wetlands as habitat for cultured fishes and conservation of a healthy environment. This was because the vast majority of aquaculture practices around the world have been pursued with significant nutritional

and social benefits and generally with little or no environmental and social costs. (www.onefish.org 2005). However, it was essential for aquaculture practice to be beneficial/ successful; the prevailing social and environmental problems should be addressed.

There was need to develop aquaculture extension materials that were gender sensitive. Since women were mostly involved in small-scale fish farming, their interests should be recognized and addressed. Mosse (1993) observed that in order to ensure that women were made an integral part of the process, it was important to improve gender awareness among all the participants, to find ways of communicating with the women directly and to base planning on the best level of information possible. This might be achieved through adaptation of designs that fit in more closely with women's priorities and capabilities. It is also suggested that socially acceptable and gender sensitive approaches to developing, training and transfer of technology in fish culture in the Lake Victoria basin be instituted.

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Chapter Seven

The Southern African Programme for Improved Transboundary Natural Resources Management (TBNRM): Equitable Access and Benefit Sharing in TBNRM

Nyasha Chishakwe, Nicholas Tandi and Stella Musiiwa

INTRODUCTION

The livelihoods of most people in Southern Africa are dependent on the use of natural resources and the environment. Most people, especially local communities depend on biological resources on a day-to-day basis for survival. They provide an important source of income through the sale of timber, energy, woodcarvings, household goods, and tourism (consumptive and non-consumptive) services. They are also used for purposes of maintaining ecological systems. Consequently, effective management of natural resources is essential for long-term sustainable development in the region. In Southern Africa, many resources cannot be managed at the state level alone because they straddle international borders. Major rivers form the boundaries between several SADC countries and numerous valuable wildlife populations migrate across borders. Based on this premise, southern Africa has witnessed a steady progression of TBNRM within the last decade. In line with this TBNRM movement, the ZIMOZA (Zimbabwe, Mozambique, and Zambia) TBNRM area was established in 1999. This report documents research findings from this area, which encompasses the administrative districts of Magoe and Zumbu in Mozambique, Luangwa in Zambia and Guruve in Zimbabwe. To date, the region is home to over thirteen TBNRM initiatives. Many countries in the region are in the process of coming up with 'TBNRM policies' or legislation to establish cooperative arrangements with neighbouring states for implementation of transboundary initiatives. It is worth noting that ecosystems that straddle national boundaries, which TBNRM initiatives aim to protect, are prone to over utilisation. The users of these resources cannot control use or impacts caused by different actors.

Despite the backing of a sound rationale, TBNRMs have proven difficult to implement because of complications imposed by ill-defined rights to land and resources in most communal areas. The main problem in communal areas is that rights to land and resources are ill defined and therefore the conditions on which the state and / or the private sector can engage communities are in many circumstances unclear. Often, therefore, communities are relegated to the fringes. Thus, far from bringing different countries together or bringing different levels of society together, TBNRM

risks creating rifts and alienating communities from this development opportunity. Equity in access to natural resources and the sharing of benefits from their uses, therefore, reign as critical and largely an unanswered issue in TBNRM areas. This research therefore examines the roles, rights and responsibilities of men, women, children, the young and the old including other marginalized groups in accessing shared natural resources and sharing the benefits arising from their use.

BACKGROUND AND STUDY AREA

The ZIMOZA TBNRM Initiative: A Brief History

Although it is common to find the abbreviation TBNRM in literature, it refers to many initiatives that differ in terms of their rationale as well as goals and objectives. Jones and Chonguica (2001) grouped TBNRM initiatives into the following four broad categories: transfrontier conservation areas (TFCAs); spatial development initiatives (SDIs); development corridors (DCs); and transboundary natural resource management areas (TBNRMAs). Under this categorization, the ZIMOZA area is classified as a TBNRMA. The ZIMOZA project therefore embraced the generic dominant objective of TBNRMAs (sustainable natural resource use for improved livelihoods) according to the above classification (Jones and Chonguica 2001).

The idea for a ZIMOZA TBNRM initiative was conceived in 1999, when the then Zimbabwean Deputy Minister of Mines, Environment and Tourism requested IUCN (The World Conservation Union) to facilitate collaboration in the management of natural resources shared by Zimbabwe, Mozambique and Zambia. IUCN then mobilized funds under their Networking and Capacity Building (NETCAB) Programme for this exercise. In the same year, two workshops were organized to facilitate dialogue. Representatives from central and local governments, NGOs, traditional leaders, and academics attended the first workshop in Harare. They discussed common natural resource use and other problems, and potential ways to solve these problems. A vision for the TBNRM area was developed and a Steering Committee was elected. The steering committee comprised two representatives from each country from their respective local and central governments (Mbizvo and Guveya 1999). During this workshop there was much emphasis on functional collaboration as the dominant strategy for implementing the TBNRM initiative. Some of the strategies to solve transboundary problems were commonly agreed to be: the need to standardize natural resources inventories; harmonization of laws and policies; joint management plans; and the formation of inter district committees. Later this aspect was in part operationalised by funding the meetings of the steering committee. Despite this emphasis on functional collaboration, discussions also pointed out that the improvement of community livelihoods was central in the initiative. Decentralization and devolution were therefore proposed as the means through which community participation would be ensured (see Mbizvo and Guveya 1999). As consultations progressed, the need to focus on the local communities became even

more prominent at workshops and meetings (see for example IUCN 1999 and the ZIMOZA Management Plan by IUCN 2002).

The second workshop was held in Kanyemba/Chapoto ward in the study area; the same issues were discussed but targeting participation at a district and sub-district level (IUCN 1999). Following these workshops, a management plan for the area was developed and endorsed by the steering committee. A Transboundary Local Area Committee (TLAC) was also formed. In the follow up period up to May 2001, socioeconomic studies were sanctioned and community consultations convened. The findings were incorporated into a Framework Agreement, which has since been finalized. The management plan spelt out community empowerment for TBNRM as a priority. The strategy for the TBNRM area was to strengthen community natural resource management institutions for effective TBNRM. These institutions were specifically identified as Campfire, the Tchuma Tchato and ADMADE (IUCN 2002). The TLAC also had as one of its terms of reference to facilitate economic, social and cultural integration and partnerships among local communities in the four districts for the purposes of conservation (IUCN files 2002). The TLAC was viewed as being instrumental in ensuring local communities cooperation for TBNRM and its meetings were funded by the project. The three countries had not signed the Agreement; despite the shortcoming that the Agreement has not been signed, activities were all the same implemented. At the request of the TLAC, a project office was established in Luangwa in March 2003. The field office undertook community and stakeholder awareness meetings on deforestation, over-fishing and transboundary anti-poaching measures. The TLAC was trained on participatory techniques in community development and project management. A bee-keeping viability assessment was also conducted. The project also sunk boreholes and built fish smoking kilns in the area. The project also donated equipment for anti-poaching operations, two speedboats and a motorbike. The field office was closed in December of 2003 and no additional funds were made available and no further development activities have been carried out since then (IUCN 2004).

Access and Benefit Sharing

The concept of Access and Benefit Sharing (ABS), as promulgated by the Convention on Biological Diversity (CBD, Article 1) is concerned with how regulations can be made to protect the rights of individuals or groups to make use of and benefit from the diversity of genetic resources found in the ecosystems within which they reside. By developing ABS regimes, it was intended that developing countries that bear the costs of maintaining biodiversity could benefit equitably from its exploitation for research, commercial and other purposes.

In conceptualizing access and benefit sharing of natural resources, the costs associated with either conservation or use are therefore important because they determine whether the 'benefits' provide incentives for conservation. Thus equity has also to be considered within the context of allocation of costs and benefits. Although formulated

within the context of genetic resources, the definition of ABS is also applied to natural resources in general. This study therefore considered ABS within the context of biological and physical resources.

The importance of access to natural resources cannot be overemphasized as it is a key asset which rural people use to produce a living (Peters 2002). Natural resources are central to the livelihood of the African population and are a major source of power and wealth. This renders access to natural resources as a major governance issue on which democracy must deliver. Mechanisms for regulating access and sharing benefits arising from the use of biological resources have been in existence for a long time in Southern Africa. They have only been recently formally recognized and popularized through the promulgation of the CBD and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Because of the novice nature of the subject, little research on the gender and equity aspects of ABS, especially in the context of shared biological or natural resources, has been done. Some practical problems exist for the implementation of robust ABS regimes for natural resources in Southern Africa under the current regulatory frameworks.

Ideally such legislation should require that access and the distribution of benefit streams be done on mutually agreed terms and with prior informed consent of local resource owners and users. Formulating sound ABS regimes has however proved to be a daunting task for many developing countries. This can in part be explained by the nebulous nature of the ABS concept itself. For example, Article 15 requires access to be subject to prior informed consent by the one who holds or owns the resource. This raises an important governance question- whose prior informed consent should be sought for resources that occur in rural settlements? Although communities are commonly agreed to be the rightful owners of the resources within their areas of settlements, this right is seldom enshrined in national legislation. State agencies, such as Rural District Councils and other authorities thus have no legal obligation to share revenue accruing from the exploitation of natural resources with local communities in their areas of jurisdiction. Article 15 of the CBD also requires parties to create conditions to facilitate access to genetic resources for environmentally sound uses by other contracting parties. Tamale (1999) highlighted two important issues, arising from the provision. Firstly, an assumption is made that the party seeking access will disclose the use and worth of the resources. This is unlikely considering that the party seeking access is concerned with profit maximization by purchasing the rights of resource extraction at a minimum cost. The second assumption is that the supplier of the natural resource is capable of determining and that will be acceptable by the party seeking access.

There is conflict surrounding this issue where for example fisheries and wildlife authorities impose restrictions on levels of harvesting on communities. Further to this, the regulations were different between countries, which had common resource pools as was the case with fisheries, wildlife and water resources in the study area. How

then would environmentally sound use be negotiated between authorities and local communities and between the different countries especially in the absence of adequate research? Although the promotion of regional approaches to EIA and the Precautionary Principle were all attempts to mitigate this problem, in southern Africa ABS was in practice a subjective area beset by ambiguity, divergent views, laws, policies and institutional arrangements.

Gender and Natural Resource Management

Gender is defined as the socially constructed roles of men and women (Nabane 1998). More recently gender has been expanded to explore the different roles between, not only the different sexes, but also age groups. These gender groups are socialized to carry out different functions, amongst which are the utilisation and appropriation of natural resources (Villalobos *et al.* 2004). Thus the focus on gender in NRM stems from the realization that different gender groups establish diverse relationships with biodiversity (Villalobos *et al.* 2004) on which their livelihoods are heavily dependant.

Many processes have been initiated directly or indirectly that address the question of gender and NRM (Table 1). These underpin the importance of recognizing the rights of women to natural resources and the need to improve their access to the resources and the benefits that accrue from their use.

Table 1. Some Important International Initiatives Addressing Gender Inequalities

1976-85	United Nations Decade for Women: Equality, Development and Peace.
1985	Nairobi Forward Looking Strategies for the Advancement of women.
1995	The Fourth World Conference on Women (Beijing Conference) and the Beijing Declaration and Platform for Action (BDPFA).
1995	Commonwealth Plan of Action for Gender and Development Dublin Declaration; Agenda 21; Rome Declaration on Food Security.
2000	Millennium Declaration: UN General Assembly.

The CBD explains the distinction between genetic and biological resources. It is worth noting that defining the local and non-local resource owner is itself confounding. Local communities who have cultural and heritage rights do have legal rights to the resources. Formally, natural resources are usually under the jurisdiction of government agencies.

Despite this wide acknowledgement that women play a central role in NRM, there have been limited efforts to incorporate gender perspectives in national and legal policy frameworks. Thus global and regional environmental governance processes, TBNRM included, based on existing national frameworks, face the risk of inheriting this 'gender silence' found in national policies and conservation programmes. Current trends in the water sector for example, face the following problems: they fail to capture the complexity of water and gender issues; women constitute the poorest segment of society and cannot afford to pay the full economic price of water; while patriarchy inhibited effective participation of women in formal institutions for water resources management. The consideration of gender in ABS on the other hand is very timely, because developing countries are being encouraged to develop ABS legislation to increase the benefits from biodiversity that accrue to them (Tamale 1999).

The Zimbabwe Water Reform Process

In Zimbabwe, land and water use was highly gender sensitive. Women were in charge of small-scale vegetable gardens, which were usually hand irrigated or planted on wetlands, while irrigated cash crop agriculture often was the preserve of the male population. While women's water uses such as gardens had not taken centre stage in the water policy issues, they were an important source of income and food for the family. The income from women's water uses was often used for meeting household needs including food, education, clothing and medical needs. Gardens for example, were not only an important coping strategy during drought periods but had also been used to grow medicinal plants and herbs, some of which provided symptomatic relief for HIV/AIDS patients. Despite this important role played by women in water management, efforts to mainstream gender in the water reform process were futile.

The aim of the water reform process was to rectify the unequal distribution of water resources through decentralization. The process however focused on commercial water uses (mostly irrigation) while placing marginal importance on small scale production. The decentralization of water management also failed to improve women's position in water management because women did not have the technical training to fill in the positions. There still existed a concern about how water should be managed to improve women's access and control of water resources and the benefits that were derived from such water use.

This gender 'silence' was in reality a focus on men while ignoring other sub-categories of the population (boys, girls, women and the elderly) that became vulnerable as their perspectives were not incorporated in conservation and development programmes. This had negative impacts for both conservation and the livelihoods of the rural poor. Firstly, conservation efforts would lose out on the knowledge that different gender groups have; such knowledge could form the basis for new innovations and adaptive capacity within these programmes. This was especially so considering that it was women who were in daily contact with soils, water, fuel wood, plant and animal species on a daily basis and educate future

generations within their communities about these resources. Secondly, the evaluation of the impact of conservation and development activities on rural livelihoods were biased towards men to the detriment of other gender groups. Ultimately efforts to conserve biological diversity would not only be sub-optimal (see Tamale 1999) but might provide insufficient incentives for women, girls, boys and the elderly to participate.

Gender Issues in Land Based Resources in Zambia

While all land in rural Zambia belonged to the state, it was held under customary systems presided by chiefs. It was also possible to gain title on customary land upon the chief's recommendation. While thirty percent of all land was reserved for women (SADC), it was very difficult for women to obtain land title from authorities. The statutory system in some districts required married women to obtain permission from their husbands before applying for land. Unmarried women were also not usually recommended unless they had children (Nayaran *et al.* 2000). Furthermore access to land did not guarantee access to other land based resources (forestry, water and wildlife products) which were governed by different institutional arrangements. Nayaran *et al.* (2000) noted that legal rights to land exist, women were not aware of them owing to a general ignorance of laws and regulations. This problem was perpetuated and worsened by high levels of illiteracy among rural women.

From the foregoing emerges the need for gender analysis of TBNRM. Gender analysis entails separation of the roles between the different gender groups thus allowing the proposal of actions that can be taken to tackle existing inequalities (Villalobos *et al.* 2004). Gender analysis is however, commonly included as decorative or anecdotal information, which fails to identify and propose actions to transform inequitable access and benefit sharing arrangements. This study however, put special emphasis on the gender dimensions of resource access and control and proposes practical actions that can be taken to address these aspects in the context of transboundary natural resource management in Southern Africa.

Institutions Governing Access and Benefit Sharing

Access is structured at different levels (household, village, national etc) by institutions that impose rules and regulations for natural resource management and use. The rules defining access commonly come in the form of property rights, norms and values (Scott 1995) and regulative institutions such as laws and regulations. In reality there are often multiple institutions influencing access to natural resources, which often compete and have overlapping jurisdictions. The next section explores the policy, laws and other institutional arrangements that define the rules for access to land based and fisheries resources in the study area.

Policy, Legal and Institutional Framework for Natural Resources Management: Land Tenure

All land in Zambia was State Land and held under Customary (94 % of all total land in Zambia) or Leasehold tenure systems. State land may be leased for up to 99 years while it was possible to gain title on customary land upon the chief's recommendation. Thirty percent of all land was reserved for women (SADC 2003). The chief allocated land in the customary land areas and the rights of individuals were subject to the prevalent customary norms. Government reservations were a third form of landholding, which allowed government to manage the land resource for the public interest (ZERO 2002). In Mozambique, all land is state land while rights to occupation and land resource use by rural communities are recognized under law. Here, land allocation is the chief's prerogative. Community tenure may be granted under law (Mohamed-Katerere 2003). Similarly, Zimbabwe has state and communal land holdings and in addition a freehold (private) tenure system. This system is widely documented to concentrate power on state agencies and thus denies the rights of individual peasants. Skewed legal pluralism exists, where the rights of individuals according to customary practices are not enforceable under common law. Private ownership of land in Zimbabwe allows the use of resources without a license. (Mohamed-Katerere 2003).

Wildlife Management in Zambia, Mozambique and Zimbabwe

Wildlife Management in Zambia

National Parks and Game Management Areas constitute Zambia's wildlife estate whose management and administration is presided over by the Zambia Wildlife Authority (ZAWA). Game Management Areas (34 in total) that cover 15.6 million hectares are of special importance for this study because of their establishment on customary land, which is under the jurisdiction of the chiefs. This usually leads to institutional conflicts of land use and property relations (ECZ 2000). ZAWA has the role of licensing all hunting activities (safari trophy hunting, non resident and resident hunting). Most hunting by locals is illegal (unlicensed) owing to their marginalization in the wildlife use, management and benefit sharing structures (ZERO 2002).

Wildlife Management in Mozambique

Wildlife resources in protected and non-protected areas are under state control in Mozambique through the National Directorate of Forestry and Wildlife (DNFFB) under the Ministry of Agriculture and Fisheries. The DNFFB Wildlife and Forestry Strategy (April 1997) seeks to promote CBNRM where settlements occur adjacent to gazetted protected areas. Personnel and expertise are extremely thin and sparsely distributed in relation to the expansive wildlife resources especially at provincial and district levels. This is worsened by inadequate communication, transport, equipment and funds, which reduce enforcement of regulations and monitoring capacity of field staff within the DNFFB.

Wildlife Management in Zimbabwe

In Zimbabwe, the Parks and Wildlife Act (1975) is the most important legislation governing wildlife utilisation, conservation and management. The Parks and Wildlife Management Authority (formerly the Department of National Parks and Wild Life Management- DNPWM) within the Ministry of Environment and Tourism (MET) is the lead institution for the implementation and administration of the provisions made under the Act. The wildlife estate is divided into National Parks, Safari Areas, Recreational Parks and Botanical Reserves and Gardens, which are, protected areas differentiated on the basis of nature and degree of permissible utilisation. Access to wildlife resources and benefits was and continues to be the preserve of a small minority owing to prohibitive entry requirements and the existence of monopolies in the tourist industry (ZERO 2002). Rural Communities derive benefits from wildlife through a community based natural resource management programme, the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE). The programme allows communities to benefit from wildlife exploitation, mainly in the form of broad based benefits (construction of transport, social services and other rural development infrastructure) accruing from use values of wildlife in the form of game viewing, sales of game meat and hides and most importantly trophy hunting. The Parks and Wildlife Act makes provisions to grant Appropriate Authority (AA) status to Landowners and landholders (Rural District Councils), thus effecting exclusive rights for making them owners of such wildlife which they can manage and benefit from. As a result of the absence of legal title to land, the rural poor cannot be granted 'Appropriate Authority' status for wildlife management and utilization, which instead is granted to landholders and the Rural District Councils (RDCs), thus according them the privilege to make access and benefit sharing decisions for the communities.

Communal Approaches to Wildlife management

A focus on communal approaches to conservation prevails as the main mechanism through which local resource users can benefit from wildlife. The motivation for implementing such programmes has been to provide instrumental incentives for biodiversity conservation usually with a focus on large mammals, which fetch large trophy prices for hunting. The revenue allocated to the community, is used for social infrastructure development including schools, clinics and boreholes where funds are sufficient. Trophy hunting has so far proved to be the most profitable venture from which large revenues worth investing community capital is derived (ZERO 2002). Participation in resource governance has mostly been realized through community conservation. Empirical experiences in these programmes has however depicted communities as "losers" trapped within a deep chasm between what people say (*de jure* policy) in policy documents and what people do (*de facto* policy) on the ground (Anstey 2001).

Tchuma Tchato, (TT) the Mozambican CBNRM programme started in 1994 and obtained its legal status from a special decree (inter ministerial diploma 92/95), which

provides for revenue sharing between the state and local communities (Zumbo and Magoe districts) and private safari operators (Jones and Chonguica 2001). The local institutional framework for TT comprises a local village council (VC) elected at village level and a superior council (SC). The SC is responsible for the overall management and has representatives from the VCs and other stakeholders (state agencies and NGO's). Apart from poor and insecure property rights, as the main constraint, the locals however lack resource and business management capacity to fully exploit the existing potential for increasing benefit streams (IUCN 2003). Similarly in Zambia, the community based management institutions are represented at village level through village councils. Representatives from the village councils in one chiefdom then form a community resource board (CRB) with the chief as patron. It is through Resource Boards and their committees (IUCN 2003) that funds from trophy hunting are remitted back to the producer community. In Zimbabwe CBNRM has had longer residence and thus communities and all the other institutions involved are more experienced than in the other two countries. The possibility for revenue sharing between the local government, (Guruve Rural District Council) private safari operators and the Chapoto ward villagers is provided for by the Parks and Wildlife Act (1975).

Water Management in Mozambique, Zambia and Zimbabwe

Water Management in Mozambique

In Mozambique all ground and surface water are the property of the state. Provision is made under the Law for easy and free access of water for primary purposes. Significant abstractions however require authorization and registration. This is subject to licensing procedures where an application for private water rights has to be made. This then confers rights to water in the form of licences (for a five year renewable period) or concessions (issued for up to fifty years) (ZERO 2002). Overall responsibility for water is under the Ministry of Public Works and Housing (Ministerio das Obras Publicas e Habitacao-MOPH). The lead agency under the ministry is the National Directorate of Water (Direccao Nacional de Aguas- DNA). Water resource management is implemented at the central and local levels. The National Water Council is at the national level while the Regional Water Administrations (Administracao Regional de Aguas- ARA) operates at the local level where they carry out *inter alia* licensing functions and the control and administration of public water. The ARA works at river basin level the possibility for greater local level and participation is through Basin Committees. In the study area, the ARA does not yet exist and the Provincial Directorate of Public Works and Housing carries out its functions.

Water Management in Zambia

All public water is vested in the president in Zambia. The Water Board, grants water rights in accordance with the Water Act. Primary purposes of water are given as

livestock and domestic consumption and are not granted without licensing (Kampata 2003). Application for a permit is however required for the secondary (irrigation and fish culture) and tertiary (industrial, mechanical and hydroelectric) purposes. Groundwater is currently not regulated owing to inadequate capacity and resources. This has resulted in unsustainable utilisation (Kampata 2003). Water abstraction is also not effectively controlled due to inadequate capacity for monitoring. Thus, the provision that makes it an offence to abstract without a water right or beyond the allocation of the water right becomes ineffective. The responsibility for water resources management falls within the ambit of Ministry of Energy and water Development. Under this ministry, the Department of Water Affairs undertakes water resource assessment and development. The Water Board regulates water use, allocation and diversion (Kampata 2003).

Water Management in Zimbabwe

In Zimbabwe water resources are governed under the Water Act and the Zimbabwe National Water Authority (ZINWA) Act of 1998. Under the Water Act all water is vested in the president. All citizens have unlimited rights to use water for primary purposes. Other water uses such as irrigation require a permit given for specified periods of time. The lead agency for water resources management is ZINWA. The institutional framework for water resources management is decentralized through Catchments and Sub Catchments councils. Through these councils, local water users participate in deciding how to price and manage water. Catchments councils with the approval of ZINWA issue licences for secondary water use.

Fisheries Management in Mozambique, Zambia and Zimbabwe

Fisheries Management in Zambia

Fisheries is the third largest employer in Zambia after mining and agriculture (ZERO 2002). The current government institutional framework has been in existence since the 1930s. However since then, policies had been centered on increasing fish production for self-sufficiency, and maximization of employment creation. This was done with disregard for sustainability resulting in overexploitation. Prevailing regulations vest fishing control and management in the state and provides for commercial fishing in all Zambian waters. While the regulations put emphasis on conservation through state control rather than public participation, enforcement of regulations has always been low. All citizens can obtain a license for fishing which is easily accessible. Of recent, there has been community based and co-management of fisheries. This however does not mean that administration and management of the fisheries are the only functions; there is also a fisheries branch, which is divided into two sections namely Research and Extension.

Fisheries Management in Mozambique

Fishing resources are public property held in trust by the State in Mozambique (Law No. 3/90). National policy emphasizes the development of small-scale fisheries. Any citizen can be granted access to fish in the Zambezi River. Conservation is envisaged through fixation of resting periods, and controlled fishing area. The main weakness of the policy is the lack of reference to communities' rights coupled with weak enforcement of regulations. Access to fisheries in the study area is through a community-based management structure (the Tchuma Tchato), which issues fishing licences and is also responsible for community-based wildlife management.

Fisheries Management in Zimbabwe

In Zimbabwe fisheries is administered and governed by the National Parks and Wildlife Management Authority under the Parks and Wildlife Act (1975). The NPWA controls fisheries directly or grants 'Appropriate Authority' status to some landowners to manage fisheries. In the Zambezi River fishing without a license is allowed provided that simple technology (fishing hooks and lines) is utilized. Commercial fishing however requires applying for permit, which locals consider restrictive.

RESEARCH OBJECTIVES

The overall objective of the research study was to assess the nature and extent to which communities in the ZIMOZA TBNRM area have equitable access to shared natural resources and how they fairly share the benefits accruing from the use of the resources.

The specific objectives were to: (i) analyze who has access to and benefits from shared natural resources in the ZIMOZA area using a gender perspective; (ii) develop policy recommendations on gender and equity issues concerning access and benefit sharing in TBNRM areas in Southern Africa; and (iii) disseminate research findings on access and benefit sharing of transboundary natural resources to TBNRM practitioners, policymakers and researchers.

METHODOLOGY AND STUDY LOCATION

The findings presented in this study are the result of a desk study and some fieldwork conducted in the ZIMOZA TBNRM area. The methodology adopted in the field was qualitative. This made use of the following tools: semi-structured interviews; focused group discussions, institutional preference and ranking matrices and observations.

Study Area Location

Guruve District (Zimbabwe)

The ZIMOZA TBNRM area encompasses the administrative districts of Magoe and Zumbu in Mozambique, Luangwa in Zambia and Guruve in Zimbabwe which meet upstream of the Cahora Bassa Dam on the Zambezi River. Natural resource

endowments which are shared, include the water and fish in the Zambezi and Luangwa rivers, wildlife, and forestry and land. Many villagers cultivate and use forest products across the borders especially because of intermarriages. There is commonality in language and cultural origin by inhabitants of the area. The infrastructure was poor, and the area was not suitable for agricultural activities due to low rainfall and poor soil fertility.

Luangwa District (Zambia)

The Luangwa district in Lusaka province has an area approximately 3 595 km². It was sparsely populated (1 person per km²) mainly by the Nsenga and Chikunda people under chiefs Mburuma and Mphuka, respectively. The district forms the southern end of the East African Rift valley and has a wide topographical range (350m at Luangwa Boma in the south and up to 1300m at Kaushishi hills in the north) (ZERO 2002). Three quarters of the district is hilltop and unsuitable for agricultural production thus much of the land is wildlife area—the Lower Zambezi National Park and Chiuwa and Lufunsa Game Management Areas. The land use patterns in the ZIMOZA included: vegetation (three distinct categories): forests (riparian forest/riverine vegetation) found along the fringes of the Zambezi and Luangwa rivers; woodland (miombo/mopane and acacia/muunga); and grassland mainly found on various wetlands systems. Soils are acidic and of low fertility, while rainfall is poor ranging from 400-700 mm *per annum* (IUCN 2003; ECZ 2000).

Although agriculture was the major livelihood strategy in the district, communities residing on the edges of the Zambezi and Luangwa rivers depended mainly on fishing and had very small garden plots within the river floodplains. Besides maize, small quantities of sunflower, cowpeas and groundnuts were grown. Reed mats, beer brewing and hunting were also practiced as livelihood strategies.

Zumbo and Magoe Districts (Mozambique)

The Zambezi divides the two Mozambican districts of Zumbo and Magoe from the confluence of the Zambezi and Luangwa rivers for a long stretch of 100km to Lake Cahorra Bassa downstream. The Zambezi has a profound influence on the ecology with its abundant resident population of animals (including hippos and crocodiles) vegetation and migratory birds. It is a vital habitat especially during the dry season. Wildlife species common to the area included elephant, buffalo, hippo, eland, roan, sable, antelope, waterbuck and zebra. Carnivores included lion, leopard, cheetah, the African hunting dog and hyena. Major vegetation types included Miombo (dominated by *Brachystegia*, *Julbernardia globiflora* and *Isobertinia globiflora*) on the plateau and escarpment areas; Mopane on the central core of the valley and Muunga, which was, dominated by *Acacia*, *Combretum* or *Terminalia* species. Riparian forest was also found along the Zambezi and its tributaries, while associated wetlands were dominated by grasslands (IUCN 2003; Namanha 1999; Brown 1998).

Agriculture was the main livelihood strategy, and mainly women practice it. The major crops grown were maize, sorghum, beans (various kinds) and groundnuts. Summer cultivation was mainly rain fed while winter agriculture was dependent on stream bank moisture. There was little livestock-rearing for subsistence purposes. Goats were the main livestock while chicken, ducks and cattle were also kept (IUCN 2003; personal observation).

Kanyemba/Chapoto Ward (Zimbabwe)

Chapoto ward in Lower Guruve District in Zimbabwe is 300 km from the national capital Harare. It is on the north-eastern border of Zimbabwe and has Guruve as the administrative centre. It is in the Dande communal area bounded to the west and southwest by the Doma and Chiwore Safari areas. The whole area is in the Zambezi valley with its associated high temperatures and low rainfall. The ward is characterized by a flat terrain with shallow calcimorphic soils unsuitable for agriculture except for the alluvial deposits of the Mwanzamutanda river floodplains. Because of the presence of Tsetse flies, cattle rearing was uncommon and most cultivation was done by hand where no machinery was available. The inhabited area is within the Dande communal area zone but also in close proximity to Chiwore Game Reserve. The two major ethnic groups were the Chikunda and Tembomvura people (Ranganai and Zaba 1995).

Agriculture was the major livelihood strategy in Chapoto. The people grew maize for subsistence and cotton for the market. Cultivation was mostly on the nutrient rich floodplains of the river Mwanzamutanda. Increasing agricultural productivity was however limited by the high temperatures and shallow and highly erodible soils which together resulted in very low moisture levels. Cattle were almost non-existent because of tsetse fly infestation. Although an important source of protein and revenue, fishing was not as important as it was in Zambia and Mozambique. This was because the Parks and Wildlife Management Authority only allowed fishing with rods and hooks unless a commercial permit was obtained. There were no such restrictions in Zambia and Mozambique (ZERO 2002).

KEY FINDINGS

Local Participation

The establishment of the ZIMOZA TBNRM area is commonly believed to have been a locally driven initiative (Jones and Chonguica 2001). Local Participation in the TBNRM Initiative was mainly through the initial consultations and later through representation in the TLAC, which was the community focal point for the TBNRM processes. During the first stakeholder consultation meeting, there were 6 local government authorities, 9 officials from IUCN, 6 from NGOs, 15 from government agencies, 2 from universities, a secondary school headmaster, a consultant and one chief (chief Mburuma) from Zambia (Mbizvo and Guveya 1999). Based on the

community preferences (Table 2), there was only one community representative, (Chief Mburuma) at a meeting with forty-one people. At a second meeting held in Kanyemba ward that was supposed to have targeted the local community (IUCN 1999), the list of participants (see IUCN 1999) still showed a domination of non-local stakeholders. The distribution of the participants was as follows: local government (20), government agencies (13), private companies (3), NGOs (3) and local community members and representatives (4). The four "community representatives" were an anti poaching scout and three traditional authorities (one chief and village heads). However it is important to note that the presence of some community representatives could have been missed since the list of attendance is based on those who actually fill in an attendance slip. Based on the level of community representation during the initial consultation stages, it is not surprising that the communities considered their participation inadequate. Thus the councillor from Kanyemba ward pointed out that from the way the project was implemented, *"It seems as they sort of guessed what we wanted, without actually asking us"*.

The poor involvement of local communities is also evident because of the lack of a common vision of the project. Thus it was the common view of the people in the ZIMOZA TBNRM area that the project was about relaxation of immigration and customs regulations and the improvement of community well being through livelihood projects. The TLAC however have a different but more accurate overview of the vision and purpose of the initiative. This information asymmetry depicts the extent to which: (i) local communities have no real ownership of the process through which the TBNRM area was created; and (ii) that community representatives (the TLAC) failed to effectively report back to their constituencies.

Consultation of women and youths was even poorer because male adults dominated local development activities in the study area. Women, for example constituted 22% and 11% of the participants in the first and second stakeholder consultations, respectively. Such poor representation during TBNRM consultations reduces the ability of communities and the different gender groups that constitute them to lay claims on natural resources. Further to this, the community meeting was held for only two days and not all issues on the agenda were covered.

Institutional Set Up

The second level of community participation, selection and representation in the TLAC illustrates poor participation. This emanates from the structure of the TLAC itself and the processes through which it was created. The TLAC comprised 17 members to represent a large rural population from four locations i.e. (Luangwa with a population of 25 190 in 2001, Guruve with a population of 135 241 in 1992 and Zumbu with 33 272 people in 1997). While the local communities were aware that the TLAC existed some of the members did not know how it came into existence. Women thought they were not represented, while boys and girls interviewed in Zambia and Zimbabwe were not aware that such a committee existed. *"We are the people who*

interact with the Zambians and Mozambicans. We are also the people who live with wild animals. Why then was the RDC who live so far away chosen to represent us in the TLAC?" asked a woman from Kanyemba. There are good reasons for such questions by the local communities. From the 17 members of the TLAC, only 6 were community representatives, while the other 11 were local authorities, government agencies and the private sector (IUCN 2002). It is worth noting however that TLAC did in fact have women and youth representatives from all the three countries. The contentious issue was that these gender groups did not feel that they were adequately represented. A key question would then be where this local area did committee deriving its legitimacy, and whose interests did it represent?

Community preferences as noted when they were asked the following question: 'With whom do you prefer to work with on the ZIMOZA TBNRM initiative?' are outlined below (Table 2).

Table 2. Most preferred Institutions for a Transboundary Natural Resource Regime

With whom would communities in the ZIMOZA like to work in a TBNRM initiative?			
Gender	Zimbabwe	Zambia	Mozambique
Men	Chief	Village head	Village chairman
Women	Campfire Committee	Chief/Village head	Village chairman
Boys	Campfire Committee	Headman	Village chairman
Girls	RDC	Chief	Village chairman
<p>The most preferred institutions are clearly based at the local level. For traditional institutions, this contrasts with the shortcomings of such institutions such as susceptibility to kinship influence and a marred history of being an extension state hegemony over the rural populace. While the preferences may to an extent be personality based, the following were given as common criteria for institutional preference by the communities: local accountability; local respect and authority; and that the institutions should reduce transaction costs involved in natural resource management (distance and time taken for effective communication; and remittance of revenue to community).</p>			

The TLAC's legitimacy crisis may have emanated from the dilemma imposed by, amongst other things, a TBNRM area that was not well defined. To achieve external legitimacy, the area had to be established at the district level, which is the lowest level of government able to formulate and implement policy within the area. This however conflicted with a suggested 20 km boundary from the border advocated for by local communities. The project implemented activities close to the border and yet the

TBNRM area covered four large districts. At the district level, citizen participation in local governance processes is poor and/or non-existent in all four districts. Thus the TBNRM process could not avoid these inherent weaknesses. This illustrates the practical problem faced by the project in an attempt to implement participatory approaches in a non-supportive socio-political environment.

The activities implemented by the project were at variance with community expectations. The community priorities common to the four districts had been identified as the building of communication infrastructure, the relaxation of immigration and customs laws to allow free movement and trade and effective problem animal management. It is not surprising therefore that the project went on to implement activities that were not part of the management plan such as the sinking of boreholes and the building of fish smoking kilns. Besides increased movement, between Zimbabwe and Zambia, it is these observable outputs that communities mentioned as outputs of the project.

Observations

Barrow and Murphree (2001) identify a typology of participation ranging from passive, information giving, and consultative and interactive participation to self-mobilization or empowerment. The community consultation process in the ZIMOZA TBNRM project best fits consultative participation where people's views are heard but the people are not necessarily involved in decision-making. The formation of the TLAC however falls under functional participation where groups are formed to meet predetermined objectives. Barrow and Murphree (2001) noted that these are the most common forms of participation. Because functional participation initially depends on outsiders but can later become enabling and self-dependent (Barrow and Murphree 2001), the level of community participation in the ZIMOZA could have improved had the initiative continued for a longer period. Inadequate community participation was also caused by the fast pace of programme implementation and the short time frame accorded to the project. Based on the institutional preferences of the community, the inclusion of local level representatives and traditional authorities such as village heads and the Campfire Committee was necessary. This would have had the effect of reducing transaction costs, increasing internal legitimacy and improving the representation of local level interests in the TBNRM processes.

The Costs and Benefits of Transfrontier Natural Resource Conservation

Contemporary approaches, to NRM in rural environments focus on balancing short-term incentives for livelihood improvement and long-term conservation goals. The costs imposed by conservation activities inform community decisions on whether there are sufficient benefits for them to participate in any community conservation programmes, TBNRM or otherwise. The following section is based on costs and benefits identified by local communities. The costs were not necessarily associated with the TBNRM project *per se* but are relevant for the ZIMOZA TBNRM project

because sustainable NRM was the central tenet that informed its design. These costs and benefits accrue differently between different communities, age groups, sexes and ethnic groups. The costs imposed by wildlife are especially conspicuous since water and fish do not have any significant negative impacts on community members' traditional and modern livelihood strategies.

Wildlife

Costs of Wildlife

Crop damage and human attacks are the greatest costs to human livelihoods. Crop destruction is mainly by hippos, elephants, buffalo, baboons and wild pigs. In March, when the maize crop is mature, the animal population in the field's increases and guarding crops means practically sleeping in the fields at night. This task is performed mostly by women, and to a lesser extent by girls, boys and men. It was revealed by women in Kanyemba, Zimbabwe that young girls who sometimes spend the night on guard end up being impregnated by young boys who will also be tending the fields. The older women raised the concern that their children end up getting married at a young age because of this. In Zambia, the communities reported that attacks by elephants and hippo commonly occur during collection of Mabuyu and Masau wild fruits, fishing and collection of reeds and barks for making baskets and mats. This has made the cutting of grass a daunting task for women. Hippos are especially dangerous and destructive for fishermen, and villagers who live and or have crops planted near the rivers. Thus the communities listed efficient problem animal management (PAM) as one of their priority needs. They are of the opinion that wildlife authorities do not empathize with them when it comes to problem animals. Similarly the issue of problem animal management was downplayed in the implementation of the ZIMOZA TBNRM project.

A commonly held perception by community members is that wildlife authorities are more concerned with preserving the animals for trophy hunting than ensuring safety of villagers and their crops. The issue of PAM is clearly a sensitive and emotional one for local communities as it involves the loss of human lives. A statement by the village chairman in Bawa, Mozambique serves to illustrate this, "*Tchuma Tchato and this company (Mozambique Safari Company) came here to kill people.*" He continued with the agreement of the men around that, "*Putting animals before human beings will eventually lead to rebellion in the area*". In Kanyenze village in Zambia the youth were equally concerned about the swift action that is taken against poachers compared to slow action taken when it comes to dealing with problem animals. The local communities in Kanyemba suggested that local communities should carry out PAM because they have skills and can act swiftly to this problem.

Access to Wildlife Resources and Benefits

Key informants (from ZAWA, Luangwa District Council, MAFF and TLAC) reported that the benefit streams emanating from wildlife revenue in the Luangwa district were

employment, schools, clinics and boreholes. Observations and interviews at the village level however revealed that these benefits were not always realized. Villagers complained that while they were aware that hunting activities generated revenue from licences and safari tour operations, they had just heard about the benefits and had never seen any development within their territory. This they attributed to their location that is far away from Boma (the district capital). The perception was that those whose settlements were closer to the ZAWA offices are better able to influence the location of services. It was also pointed out that the same obtains for those who have access to information and close friendship or relations to the members of the CRB. Owing to this, Kanyenze residents drink raw water from the Zambezi River while other villages have borehole water. In Chidada village however, which is much closer to Boma, the district capital, boreholes have been sunk using wildlife revenue. Corruption was raised as the major access barrier to benefit streams. Because the community does not know how the system works, it is open to abuse.

The ZAWA attributed lack of benefits in some of the villages to the scale at which they are distributed. The area is too large considering the available revenue allocated for communities. This, confounded by the bureaucratic delays of disbursement, worsens community access to revenue. This is because the money first goes through central government. The community allocation is then slowly remitted back through the CBNRM-central government linkage structures. Studies elsewhere within the same district have shown delays of up to one year in fund disbursement, which has resulted in slow progress and even abandonment of projects (Hachileka 2000). Furthermore the location of community projects has been close to chief's residence.

The employment levels offered by the wildlife industry are low compared to the population. Game scouting is the only form of employment that was known by the communities. Such employment has a gender bias because it is considered to be for the physically fit thus excluding women, girls and the elderly. Girls were reported to drop out from school and marry earlier than boys. Coupled with their toll of household responsibilities, it is unlikely that they would benefit from any employment opportunities.

Illegal hunting of wildlife was reported to be rampant. This is seen through the increase in snares (especially in Luangwa valley), arrests of poachers and unprecedented decline in certain wildlife species. The community on the other hand reported that illegal sales of game meat are common and have not declined. The target animals for poachers are large game (especially buffalo, warthog, zebra and kudu), elephants and hippos. Snares are commonly used for subsistence hunting while various types of firearms are used for trade hunting that is less frequent. Bush fires are also used for illegal hunting. In 1998 the ECZ reported that illegal utilisation of bush meat was a major contribution to meat sources for urban and rural areas in Zambia. The same sentiments have been echoed by more recent studies in 2003 by IUCN (IUCN 2003). A flourishing trade of game meat is providing incentives for the

poaching of wild game. ZAWA have observed that much of this illegal access occurs in areas where a good road network exists for efficient transportation such as the area under chief Mpasha. As a result of the lack of control of non-licensed hunting, there is a decreased observance of taboo and totem restrictions (IUCN 2003) which has been in part attributed to hunting by non-locals. Village scouts employed under the CBNRM programme become equally resented as wildlife authorities when they perform their duties expediently. They are usually not expected to report on their kinfolk.

At Bawa village (Chinthopo ward, Mozamabique), proceeds from Tchuma Tchato have built a school (it is however in a dilapidated state and has a thatched roof) and a grinding mill. Bush meat is also given to the community when killed during safari tour operations. Of the little employment emanating from wildlife industry, there are 30 formally employed in Magoe and of these only 3 are women. There are no women in the anti poaching unit. Anti poaching operations are not regarded as women like activities. Very few girls go to school and of those who do; the drop out rate is high. The result of low literacy levels and poor education, in particular for women, reduces their ability to benefit from employment opportunities; and their reduced input into project identification, design, planning and implementation. Wildlife benefits are far below community expectations when compared with the costs. This leads to an increase in illegal snaring and shooting of impala, duiker, buffalo and moles. Ironically, poaching has not been limited to villagers seeking subsistence. A district officer from Zumbo and a game scout from the area were once 'arrested' by the TT manager when they were found in possession of animal carcass.

In Chapoto ward, Zimbabwe, the CAMPFIRE committee receives their allocation of wildlife-based revenue from the RDC and administers it on behalf of the communities therein. The money is used in accordance with development plans agreed on by the communities. So far, the revenue has been used to build a primary and a secondary school, a grinding mill, sinking boreholes, and the purchase of tractors for ploughing. The funds have also been used to sponsor the local football team. There were times when household dividends and food handouts (especially for the elderly) have been given and school fees paid for orphans. The village heads are allocated game meat killed during the safari tour hunting expeditions.

The Chikunda people who are in the majority dominate local and CAMPFIRE politics. The second major group of people, the Tembomvura/ (also commonly called vaDema) is settled on the eastern side of the Mwazamutanda River. Benefits from wildlife have traditionally been relatively lower for these people. Reasons that account for this include the following; they have a history of surviving on hunting and gathering of wild fruit, activities that have been disrupted by the CAMPFIRE programme. They have also had smaller landholding thus limiting their ability to benefit from agricultural-focused benefits such as tractors. Because of this, they are involved in most illegal hunting activities in the area. This is done by snaring and

other trapping of mostly small species which are easily overpowered. Small species are also preferred because it is easier to evade scouts when hunting.

As in Zambia and Mozambique, those who are not very well educated cannot benefit from employment created by wildlife conservation in Zimbabwe. The Tembomvura and women generally lose out based on this characteristic as they are the least educated of the community. It emerged from the discussions that employees of safari companies, CAMPFIRE committees, and the surrounding lodges are really a limited group of people who just rotate between these jobs. Only a few people have also been employed by organizations conducting research activities in the area.

Fisheries

Access to fisheries

There is a remarkable difference in access to fisheries between communities from the three countries. Differentiated access is mainly dependent on national policy legislation, which dictates harvesting levels, methods of fishing, permitting systems and fishing times.

In Zambia, all citizens are allowed to practice commercial fishing in the Zambezi and Luangwa rivers upon obtaining a permit from the fisheries department at the district capital in Boma. Although the fisheries department has the mandate to monitor fishing catch and effort, they have neither the financial resources nor the personnel to carry out this role effectively. The Department empathizes with the plight of inhabitants because they are constantly faced with food shortages owing to droughts and poor agro-ecological conditions and have to depend on fish to sustain their livelihoods. Thus they admitted that most of the fisher folk were not licensed.

Boys and men mostly carry out fishing activities while the women are involved in processing and trading. These women are thought to be mostly widows or female household heads. Female fisher folk and traders are obliged to bring back their earnings to their families. The general perception (by men) is that females are satisfied with their role in fishing. Thus the extension officer commented that "*we have never heard them complaining*".

Most of the people who are involved in fishing and fish trading (both males and females) are non-locals. Non-locals dominate commercial fishing while fishing by locals is mainly for subsistence. This is because all citizens regardless of their area of residence can easily obtain fishing licenses. Benefits from fisheries are therefore more dependent on access to external markets and capital. Licensing is not and has never had any effect on limiting the number of people who engage in fishing nor their levels of harvesting. Firstly because there is no limit to the number of licenses given and secondly because a significant proportion of the fisher folk are not licensed. This is worsened by the fact that a Zambian license is not a requirement for fishing in the Luangwa River. To fish in the Luangwa, either a Zambian or Mozambican license will

suffice as none of the authorities have greater jurisdiction over these shared waters. It is this jurisdictional overlap and the resulting confusion in the management of the river that fisher folk exploit.

Cross border kinship ties are very important and guarantee access to fisheries. For example, some Zambians have families that reside in Mozambique. Since there is no limit on the number of licences issued and coupled, with poor enforcement of fisheries regulations, fishing in the Luangwa is not controlled and resembles an open access situation. Destructive practices such as fish dragging using gill nets are therefore very common. This is especially so in the Luangwa River, where the closed season for breeding has been unofficially lifted. This has been done in reaction to the fact that there exists no such closed season on the Mozambican side of the Luangwa. Regulative control is greater on the Zambezi than on the Luangwa because a closed breeding season is still observed as exists on the Zimbabwean side of the river. Closed season dates are however not synchronized, thus defeating the purpose of their introduction. The effectiveness of closing the fishing is questionable, considering the poor monitoring on the Zambian side of the river. Closed season fishing by young boys is common at night in Zambia. Smoking of the fish is then done during the day in the bushes to avoid attracting the attention of fisheries authorities.

Similar to what one obtains in Zambia, in Mozambique any citizen can obtain a license from the Tchuma Tchato office close to the Zambezi River. The TT has tried to implement community-based fisheries management. There is no limit on the licenses issued and enforcement of fishing regulations is very poor. No provisions are made for a closed breeding season. Thus fishing here also is uncontrolled and dominated by non-locals. A significant proportion of these non-locals are Zambians who have access to better markets as far as Lusaka and the Copperbelt. The ability to speak the local language, Chikunda, ensures non-locals easily blend with local fishermen and thus will go unnoticed by fisheries authorities. Close friendship ties and relations with the locals can also guarantee non-locals access. Contract fishing is also common whereby fish traders pay locals to fish for them. These traders are commonly women mainly from Zambia. Local women's role in fishing is limited to fish processing (cleaning and drying). Distribution of fisheries benefits to beneficiaries (stakeholders) in Mozambique was as follows; state (40%), community (20%), district (10%), and TT programme (20%).

Unlike on the Zambian and Mozambican sides, the PWMA in Zimbabwe only sanctions fishing with lines and hooks, save for one cooperative, which practises commercial fishing using gill nets. This renders fishing a non-lucrative industry for non-locals who to a very small extent only come to buy fish. Some Zimbabweans have reacted to this by fishing using cross border relations and friendships to allow them access to fisheries on the Luangwa and the Zambian and Mozambican sides of the Zambezi River. Non-licensed fishing is also practiced, although to a lesser extent compared to the Zambian and Mozambican sides.

In all the communities, fishing is regarded as a male activity. Women reported fear of crocodiles as a major deterrent. Women used to fish with mosquito nets in ephemeral ponds and rivers after flooding. In Zimbabwe, the PWMA does not permit such fishing activities. Men and boys have total control of fishing revenue from their own fishing activities. They will commonly remit some of the income to their families. Fish that is for household consumption is under the control of women. Women and girls income from fish trading is remitted to their families. They do not, as their male counterparts do, retain the prerogative to decide how to allocate different proportions of the income. Fisheries may or may not improve the well being of the household as dictated by male decisions. It is worth noting however that the status of women in the area cannot be generalized. Some of the women are visibly well off and are well respected. This includes women's representatives in the TLAC and political parties as well as the wives of influential people within the community.

Determinants of Access and Benefit Sharing

The preferred benefit forms by the different study groups in the study area are outlined (Table 3).

Table 3. Preferred Benefit forms based on Gender

Gender	Preferred benefit forms
Men	Farm machinery; Agro chemicals; Capital for trading and building projects
Women	Gardens; Livestock production; Solar Power; Support for Cookery project
Boys	Books and uniforms; Support for carpentry and brick moulding projects; Training on hunting; Rifles for hunting
Girls	Books and uniforms; Support for cookery and sewing projects
Elderly	Household dividends; Food

Nature of Benefits

Because the communities in the study area are impoverished and have for a long time lacked basic social services, their needs have remained similar for a long time. Thus the provision of broad based benefits in the form of schools, boreholes and grinding mills from wildlife and fisheries revenue were preferred by most members of the communities. Other commonly preferred forms of benefits include clinics and irrigation equipment. The broad based benefits, which have been generated by TBNRM initiatives and CBNRM programmes have thus catered for different gender

groups. For example, schools benefited the girls and boys who previously did not attend school, or did so in very distant areas outside their wards of residence. The provision of grinding mills and boreholes reduced the distances travelled by women and girls to fetch water and grind grain. As the communities developed, their needs also changed. The different gender groups now have different ideas about the forms in which benefits from natural resources should come. The same applies for communities in the three countries. This poses a problem for the implementation of a TBNRM initiative because of the diverse preferences of benefit forms. There are differences in the benefits preferred by different ethnic and gender groups. Elsewhere in Zimbabwe according to Nemarundwe (2003), supporting women's gardens has been shown to increase their access and control of communal land in order to improve their social standing in the rural settings.

Some of the community members have no alternative livelihood strategies and prefer household benefits from the revenue derived from natural resource use. Community development projects may not cater for their immediate needs. This is the case for example, for the elderly who cannot engage in farming, fishing or hunting. The programmes have attempted to provide for the different needs by diversifying the form of benefits. For example, in Zimbabwe households have received food during drought years. This has not been possible in Zambia and Mozambique. The major problem is that the amount of revenue from fisheries and wildlife use cannot cater for the direct needs of households given the population and the wide area where benefits should be spread.

Resource Tenure and Property Rights

Having established the natural resources within a TBNRM area as belonging to the inhabitants of that area, the issue of prior informed consent (PIC) becomes especially precarious. A major limitation for PIC and MAT is the issue of resource tenure. In none of the three countries do the communities have *de jure* or *de facto* resource ownership. The rights of withdrawal (hunting, fishing or use of water) can be acquired through licensing procedures. Communities find these procedures prohibitive especially for wildlife resources whose use is dominated by private tour operators. While communities are consulted through CBNRM programmes, management rights are ultimately held by state agencies. Quota setting is a good example where communities set quotas but wildlife authorities dictate the final quotas. Exclusion rights belong to the state in Zambia and Mozambique and to the Rural District Council in Zimbabwe while alienation rights belong to the state in all three countries. Thus by common law, local communities have been relegated to authorized entrants into the wildlife estate and at the best-authorized users for fisheries and water. To implement the principles of prior informed consent and mutually agreed terms, the communities should be proprietors (having at least the rights of management and exclusion) of the natural resources found within their settlements. The communal land tenure system is the main constraints for some of the communities in the ZIMOZA to

exhibit proprietorship status of land-based resources. Whereas it is possible to devolve wildlife resource ownership to landowners in Zimbabwe, communal dwellers cannot be afforded the same rights, which are instead given to the RDC. Ownership of land is critical for communities to benefit from land-based resources. It would also increase access to water resources for commercial purposes because land title is required for water permits.

Although vital, secure land tenure is an insufficient prerequisite for communities to benefit from other natural resources. For example, the Zambian communities can apply for government leases on communal land. Even with such a lease, the landholders would still be subject to normal licensing procedures for the use of wildlife and fisheries resources in the areas within which they reside. With no legal rights to natural resources, the communities have no basis to demand revenue sharing or to negotiate how exploitation of the resources should be carried out. Under the current policy and legal framework, the prior informed consent of local communities is not required for resource exploitation. This then means that resource use is not on mutually agreed terms. The devolution resource tenure is a strategic national policy decision from which community capacity to benefit from TBNRM would be enhanced. Bearing in mind that this recommendation is not new to Zimbabwe, Mozambique or Zambia and has been resisted widely by some elites who would lose out from such arrangements; it is worthwhile discussing what pragmatic steps TBNRM initiatives could take to increase community benefits in the absence of appropriate tenure arrangements.

Currently the communities do not have the privilege to information on the quantity of resources and the purpose for which they have been extracted. For fisheries, this is because even the authorities do not have the information owing to resource constraints. For wildlife resources however, there is great disparity in the information available to the authorities, private safari tour operators and the local communities. Local communities in all three countries reported a lack of knowledge concerning (i) the quota granted to private tour operators and (ii) the revenue, which accrues from the hunting activities. The absence of such information limits the negotiating power of local communities. Because they are aware of the value of their resources, they cannot then determine what proportion of the wildlife revenue is due to them. This is even worse for fisheries whose value is determined at markets very far away from the place of origin and out of reach of the local communities and fisheries authorities. Locals will participate effectively in natural resources management, only when this vital information can become available to them. Such participation can be in the form of including local institutions that are accountable to the local resource users. Resource valuation presents another problem for acquiring prior informed consent from local resource users. While pricing can be done with little impediments for fisheries and wildlife because they have 'real' markets, the valuation of water resources is more problematic. It is therefore necessary to develop sound natural resource valuation

techniques that are acceptable to wildlife, fisheries and water authorities in all three countries.

RECOMMENDATIONS

- There is a need for true representation of communities with specific attention to different gender groups. The next step would then be to strengthen the capacity of these representatives to participate in formal committees and articulate community claims at a TBNRM level. With adequate capacity these local level institutions can then directly receive and manage revenue accruing from the use of natural resources on behalf of their constituent communities.
- Establishment of a TBNRM area involves divergent groups and interests and many communities. The communities in the ZIMOZA area do not have adequate communication channels for these groups to interact and share information. There is therefore a need to strengthen community social communication mechanisms. This should incorporate strategies to improve access to information by all the gender groups.
- If transboundary development and conservation takes the rights-based approach seriously, then the communities should be educated about these rights. This is especially so for women because a lot of women in the ZIMOZA area lack basic education. Providing education for women will also increase their ability to participate and benefit from natural resource activity and give them a comparative advantage over non-locals.
- A rights-based approach requires as a prerequisite that these rights be enshrined in formal institutional arrangements such as policies, laws and constitutions. In the absence of formal ABS legislation a pragmatic approach therefore is for TBNRM programmes to establish local-level interest negotiating forums for the different stakeholders and genders.
- There is need for joint management plans for fisheries, water and wildlife for the three countries. These could be the basis for establishing joint EIA, sustainable harvesting levels and methods and closed fishing seasons for the three countries.
- In order for communities to have legitimate claims on natural resources, there is need for resource tenure reform. Communities should have the right (enshrined in law) to manage and exclude non-locals from resource exploitation. These rights should be based on place of residence, which should be within the TBNRM area.
- The benefits preferred by different communities and genders are very diverse and sometimes incompatible. Some of the community members' needs are

basic including food and clothing. TBNRM should therefore produce both broad-based benefits to community level and dividends at the household level.

- For different gender groups to benefit, the TBNRM programme should pay equal attention to the prioritised needs of women, girls, boys, men and the elderly. This can be done through supporting activities which improve resource access and control by previously-marginalized groups. Gardens for example are a preferred form of benefit suggested by women. They have more control of land and water on which these gardens are established as well as the crops that are grown.
- Commercial resource use should be balanced with community resource use. This is because men control commercial use that generates income whereas non-commercial activities for household consumption are usually the preserve of women.

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Chapter Eight

Conclusion and Recommendations

Fiona Flintan and Shibru Tedla

This final chapter will first discuss a number of ways that conservation and development organizations have tried to overcome the challenges faced in mainstreaming gender issues within NRM related projects, with varying success. The challenges faced by incorporating gender into NRM research will also be discussed and ways to conquer some of these challenges suggested. Finally the chapter and this volume will wrap up by summarizing the conclusions raised by the different contributions found herewith and finish with a set of recommendations for mainstreaming gender in NRM and NRM-focused research.

Mainstreaming of Women and/or Gender

Where attempts have been made to include 'women' or 'gender' within programmes, projects and activities as some of these contributions have shown, organizations tend to have taken one of two different approaches: either women-focused projects or those taking a gender-mainstreaming approach.

Women-focused Projects

Women-focused projects are based on a number of assumptions including:

- Women are 'missing out' from male-focused activities.
- When women's immediate needs (practical needs) are met, then they will have more time for investing in conservation practices.
- If women's income increases through diversification of livelihoods then they will have less reliance on natural resources.
- The use of natural resources can be replaced by alternatives.
- Population growth and pressure is a primary cause of environmental degradation.
- Women are more easily mobilized; credit worthy; and have a greater entrepreneurial spirit than men.

Such projects often include income generation activities, credit and savings projects, and health provisions and family planning. Though they may provide some short-term benefits, in general they fail to tackle deeply embedded and complex gender inequalities (Flintan 2003). As Watson (2005) describes, though some projects 'balance' their field-based activities with men with income-generation activities with

women, their connection to NRM is often tenuous and problematic: "firstly, as these aspects...involve women more than men, it follows that the hard work of challenging social inequalities is largely left to them. Secondly, such approaches perpetuate the stereotypical ideas that men's roles are in the fields, being productive, whereas women's roles are in the home, carrying out 'petty' income generating activities and nurturing the wider society."

Gender-focused Projects

Gender-focused projects are based on a number of different assumptions:

- Women's projects have not achieved enough: a focus on 'gender' is necessary if the inequities in communities are to be better addressed. Men need to be involved. However due to continuing inequities; there is still a need to target women.
- All community members, including women should be involved in NRM since all have roles and responsibilities.
- Gender projects aim to 'empower' women to have more opportunities to better their own lives and take part in NRM and conservation. If women can better their own lives, then they will have less reliance on natural resources.
- Women can take more interest in and be more capable of participating in decision-making processes about protecting the environment and its sustainable use.
- Improving women's status will reduce fertility, subsequently resulting in less population pressure on resources.
- If women feel more secure, then they will invest in conservation.
- Change is more meaningful when it happens on a community's own terms and at a pace that the community is comfortable with. Knowledge needs to be provided on different options for change and skills built so that women initiate change themselves.

Such projects include education and literacy programmes for women, skills and capacity building; support for women's collective action and groups; and a mainstreaming of gender issues throughout conservation and development projects, CBNRM, PFM etc.

Tinkering on the surface of unequal gender relations is going to achieve little in the long-term. Without dealing with the institutionalized and embedded inequalities, no real change is going to be achieved. It may be necessary to promote small but quick changes as an initial first step to fulfil project/management requirements; however this should be accompanied with commitment to longer term and deeper changes where people are taking more control of their lives, the impact of which may not be

seen within the project lifetime. Some of the positive and negative aspects of projects that attempt to take a more gender-focused approach are summarized (Table 1).

The latter will involve dealing with sensitive issues such as power, control and access to resources. The scope for improving livelihoods on the basis of NRM is reliant on producers having secure tenure rights (amongst other things). If women are to be included then their security of rights needs to be improved. Further it will take time and support for women to play a truly participatory role in decision-making processes and likely to need a process of capacity and confidence building, as well as a more collective approach. Where traditional (male dominated) institutions are supported, it is likely to be necessary to look outside these to find the right forum for women to voice their concerns; needs etc. e.g. within Women's Associations (Muir, 2006). Linkages will then have to be established between these groups and traditional decision making bodies to ensure communication, inclusion, etc.

Table 1. Positive and Negative Aspects of Gender Focused NRM/PFM Projects

Positive Aspects of the Projects

- Can increase community employment opportunities.
- Offers opportunities for women to be employed in traditional men's roles.
- Offer alternatives for natural resource use.
- Long-term benefits generated through sustainable NRM.
- Indirect benefits generated such as improved watersheds and climate.
- NRM recognizes the need to involve women as e.g. forest users – that is not just because they are women.
- Usually NRM recognizes the heterogeneity of communities.
- New institutions created can promote women in decision-making processes.
- Increases number of women on forest and conservation committees.

Negative Aspects of the Projects

- Often jobs created are for males: jobs for women are mundane and labour intensive and entrench gender roles.
- Forest and conservation is still dominated by men.
- Few women are educated in skills and knowledge needed for work in conservation and forestry.
- Income generation projects fail to adequately consider/support markets.
- Alternative fuel projects are rarely successful: benefits of moving to alternatives must outweigh transfer costs.
- Lack of history of community forestry in some parts of Africa.

- Traditional institutions that are supported can be biased against women.
- Often forest agreements are made with head of households: usually men.
- Women's attendance at meetings can be difficult and non-participatory.
- Gender awareness workshops carried out in a 'finger wagging' demeaning manner. Long-term investment is needed.
- Distribution of benefits is problematic.

Challenges to Including Gender in NRM Research

Including gender in NRM research proves highly challenging, as many of the contributions found in this volume have confirmed. The main challenges are the following:

Large Number of Stakeholders

The active involvement of NGOs, local governments and community groups is now a feature of many participatory natural resource management initiatives. As a result a number of challenges can arise:

- To take account of and understand a range of diverse views and interests: this may be time consuming and demand a range of methodologies and tools. Additionally the researcher must be open to different perspectives – some of which may conflict with one's own ideas.
- With a large number of stakeholders there is likely to be power dynamics; some stronger groups and some weaker. Often women will have less power and therefore if one wants to include them, then successful participatory and inclusive methods will need to be used. These can take time, resources and special skills e.g. patience and persuasion.
- To work together with divergent and conflicting views – this may need mediation, negotiation, consensus building and possibly, conflict management.
- Issues of scale and representation: because of the large number of stakeholders who are likely to be spread over, a large geographical area it is going to be important to ensure that a representative group is included in the research. This needs to be considered in relation to the resources and time available to carry out the research: availability of resources may limit the achievement of as true a representation as possible.

Integrated Nature of NRM and Environmental Issues

NRM and environmental issues are highly intertwined with such as politics, economics and society. Therefore carrying out research on NRM requires:

- Interdisciplinary knowledge (either within an individual or within the team).
- A recognition and exploration of the linkages and complicated relations: this will involve more time and may divert the researcher from the main purpose of the research.
- Issues may be politically and socially sensitive: may be difficult or impossible to carry out the research e.g. on land issues, or power relations in the household.
- Difficulty in assessing cause and effect: could be a number of factors and difficult to separate out. Almost impossible to predict change as so many 'external' and 'internal' factors that can influence change: difficult to have controls over the process and results. As such a flexible and adaptive research process and project is needed.

Nature of Rural Society

When carrying out research on natural resources and environment and including social aspects, one will most certainly have to work with and include rural communities. This offers challenges in itself:

- Logistical challenges of getting to rural communities, particularly those who are more isolated – need for appropriate transport or walking long distances; staying in villages with poor accommodation and food etc. There is a need to avoid potential biases due to weather (only carrying out research when good); geographical (only visiting those communities who are close to road or town); and people (only talking to those individuals who are easily accessed).
- Building up trust and rapport can be difficult – perhaps one has little in common with the respondents and is seen as an 'outsider'. One may need to work through a local partner (which can have its own challenges).
- Local communities are likely to have different ways of thinking and doing things. The idea of carrying out research and the different tools used may be alien to them (particularly to those, such as women, who are less exposed to alternatives) and the researcher will have to introduce them with patience: this will take time and resources and still can risk misunderstandings. To help overcome this 'triangulation' can be used i.e. using a number of different tools and methodologies to access information, as some of the researchers in this volume used.

- Rural communities particularly women are usually very busy: often working full time just to keep themselves (and their family) fed and alive. Thus it may be difficult for them to find time to give for answering questions and/or to attend meetings. The research may not be a priority for them: they have other more important things to do. How do you 'bring communities on board' and see the value of the research? Does one pay them for their time? How do you persuade them to risk action based on your research? It may need time and skills to explain the research purpose and benefits to them. We must also be careful of not raising expectations too high e.g. finding solutions to their problems.
- There is a need to move away from doing research *on* things and people and shift towards carrying out research *with* and *for* people. This requires new research perspectives and practices which are still in development.

Encouraging Participation

- Participatory research is difficult. The building of trust is essential, but this may take time and patience. The process of organizing often involves struggles over the definitions of rules and norms, and researchers may become entangled in these struggles.
- It requires appropriate skills, experience and attitudes of outside facilitators to create an enabling environment for people to speak out; listen to them; and guide the research in a direction that fulfils objectives but allows freedom for exploration of new areas. There may be a failure to listen and show appropriate respect.
- It should be remembered that information and knowledge are not value free and to be aware that selective choice of information or knowledge may empower some people while displacing others. Knowledge is always socially constructed and often disputed. More analysis and reflection on the question of how different types of participation influence research results is needed.
- It is difficult to keep track of research processes and information collected when there are a large number of people involved.
- It may be difficult to find the right questions to task – we want to be open to what we don't know as well as what we think we know. As such we may only see part of the situation, overlook the invisible, and generalize based on too little information or too few informants.
- It may be particularly difficult to include women e.g. for interviewing (see special issues for consideration identified below).

Special issues to think about when interviewing women

- There may be resistance from husband/men;
- Need for women on interviewing team;
- Finding a suitable time and place for the interview;
- Women may be more easily distracted, e.g. by their children;
- Women are more easily intimidated-they may be shy and not aware of the value of their knowledge and contribution;
- Strong women may dominate an interview;
- Often women are illiterate or their understanding is less: need for diagrammatic technique and patience; and
- Key informants in a community are usually men; there may be a lack of key women informants.

Challenges within Environmental Research In Particular

As the chapters above have described it is only recently that social issues (including gender) have been successfully integrated into environmental research. As noted, challenges still exist due to the following factors:

- Knowledge of and experience in social science research among NRM researchers and research managers is limited.
- Generally social science components are not well integrated with natural science components in most research efforts. The contributions here have shown that it is both possible and worthwhile.
- Researchers and research organisations can have different starting points, interests and expertise in terms of social and gender issues. Social and gender issues can be seen as 'less serious' than more scientific subjects.
- 'Gender blindness' or the refusal to acknowledge the importance of gender issues is common in research and research-based policy making: usually research does not go beyond the 'diagnostic' level and e.g. the description of the division of labour (roles of men and women). There is no analysis of the more important and complex gender and social relations. There is a need to create awareness on continual basis.
- Short-term training has limited impact: it needs to be ongoing, based on action learning, and practically-based.
- Resources in the areas of social and gender analysis are difficult to come by.

- Networking has potential benefits but is not easy operationally. Again this research programme has shown it is possible.
- It is difficult and challenging to move from descriptive research and documentation to more explanatory research and writing.
- There is an absence of a proper institutional framework or institutional body responsible for working on social and gender aspects. Efforts of agricultural research and development institutions toward social and gender issues are scattered and lack proper documentation. Meeting the right individuals and finding useful documents is time consuming. To a great extent this programme has overcome this, though it is important to ensure that networking and support continues.

CONCLUSIONS

The studies found in this volume have confirmed many of the issues, problems and factors rose in Chapter 1, and once again highlighted the necessity of taking a gender-sensitive approach if a fuller understanding of the context and impact of natural resource management is to be achieved, together with more gender equitable outcomes.

The researchers have confirmed that in general men and women work together in reciprocal relationships with different roles and responsibilities that result in a functioning household livelihood system. However they also stressed the dynamic nature of these relationships, influenced by such as time, wealth, level of education and the nature of production processes (Girma et al, this volume; Macharia et al, this volume; Mawaya and Kalindekafe, this volume). That is, it was the wealthier (and perhaps in a better position to take risks); the better educated; and the younger farmers who tended to be more open to trying out new technologies and supporting change. As Naigaga et al (this volume) quite clearly showed certain sections of the local communities utilized the wetland resources in different ways: the middle aged, poorly educated, low income families and older women for example, relied heavily on the wetlands to provide everyday needs.

It was stressed that households are not uniform decision-making units, but rather represent complex interactions of individual interests, abilities and priorities of different male and female household members (Macharia et al, this volume). Women and men have different life experiences, knowledge, perspectives and priorities. As such, there is a need to avoid preconceived assumptions and stereotypes (Girma et al, this volume; Macharia et al, this volume).

Gender divisions of labour have impacted how men and women relate to natural resources in different ways and use them based on their gender roles at household and community level (Mawaya and Kalindekafe, this volume). Macharia et al (this volume) show in detail, how gender together with age, wealth and education, have direct impact on the uptake of soil conservation methods. Further, Girma et al (this volume) stress that unless gender relations are understood, and then technology transfer can be hampered, in this case in the transfer of new varieties of potato and related production methods. Though women provided most of the labour in potato production, they had been ignored during vital decision making processes and this heavily influenced the uptake of the new technology i.e. hindered it.

Gendered roles and responsibilities in natural resource management and agriculture influence men and women's needs, perceptions and knowledge (Girma et al, this volume). Often others control the access to natural resources such as men over women's access and local government over men's access. Thus social divisions such as age, status and ethnicity were also important for defining who had access and power over use of resources at community level than at household level (Mawaya and Kalindekafe, this volume).

As new livelihood opportunities arise based on use of natural resources, it has been shown that both men and women will equally make the most of these new opportunities albeit in different roles based on different motivations, needs and access to resources. For example in Uganda, Justus Rutaisire et al. (this volume) highlighted the involvement of men and women in the relatively new aquaculture industry. However it was only widowed or female *de facto* household heads who owned land or fishponds, and even despite women's involvement it was still men who were targeted by information and input support from such as extension agents. Further Macharia et al showed how land was the most limiting farm resource in smallholder maize-based production systems, followed by labour and working capital respectively. This is especially so for women farmers who have limited control.

All the chapters stressed the existence of gender inequities in access to assets, means of production, and economic benefits from sale of natural resources or agricultural goods: with women missing out and/or failing to benefit as do men. Not only is such a situation accepted by the men, it is also accepted by the women themselves who fail to see a way out and view such domination as given (Girma et al, this volume). The studies also confirmed men's domination of decision-making processes and bodies, at the local level and above. This has meant that decisions concerning the environment tend to be more related to men's needs and preferences than women's. Where women had organized themselves into a controlling body, for example in the wetlands of Uganda, men failed to respect them (Naigaga *et al.* this volume).

Indeed, despite supporting evidence that women can play a central role in NRM, it remains assumed that the natural partner for NRM are male community members (Chisakwa et al, this volume). For example, Mawaya and Kalindekafe describe how

despite evidence that women have been involved in fishing more than men from the ever depleting river stocks, supplementary fish farming in the area has been directed almost totally at men. Further, Rutaisire *et al* (this volume) describe how despite women being involved in fish farming, extension services are almost always targeted solely at men.

Indeed as described above, often conservation and natural resource management focus around the development of institutions and organisations. More often than not, these are based on traditional male-dominated institutions and organisations without due concern of women's involvement and or alternatives that might better represent them. This is despite the fact that women rather than men tend to be more willing to form cooperatives and self-mobilize as a group to share responsibilities and resources, provide support, and even to initiate change (Jutaisire *et al.* this volume). Women associations for example offer good opportunities as a foundation for more formal institutions that could be involved in conservation activities and provide space for a focus on women's interests and needs, but their contribution has yet to be fully recognized and utilized. JUWWO as a women organization is facing the same challenges (Ngaiga *et al.* this volume). However though many of the studies supported the development of women's groups and women working together to overcome some of the constraints that they face, however this is not always without problems, Jutaisire *et al.* (this volume) described the problems a group of women faced.

The biases that women face tend to be both structural and attitudinal in nature, which combine together to be particularly enduring. Naigaga *et al* (this volume) verify the fact that those working for conservation organisations, including governmental, do not have a good awareness of gender issues. Employment opportunities remain biased towards men e.g. as conservation scouts or anti-poaching agents (Chisakwa *et al.* this volume), aggravated by women's poor illiteracy and lack of input into project design and implementation.

Indeed, still, within NRM/PFM projects rarely is there proper planning of gender aspects in the design of projects, log frames etc. Research and adequate studies to understand gender issues in the local context do not take place. As such, rarely is an adequate understanding of gender issues within local communities achieved prior to intervention design and implementation. Often project staff come from 'outside' the local area and are male. Therefore they are less likely to have an awareness of local gender issues, whilst lacking rapport and trust with local communities. Understanding is piece-meal and non-consistent. Attitudes tend to focus on technical aspects first, and 'gender' is seen as something to tackle if problems arise by someone brought in to do 'something about gender' rather than mainstreamed from the beginning. 'Gender awareness raising' in local communities is carried out in a finger-wagging manner that achieves little positive response or impact.

Even though organisations (project and/or conservation) may consult with 'communities' before making decisions about activities or interventions, because decision-making processes are dominated by men, the decisions or conclusions may be heavily biased. Though in some cases it may be true that women's views and needs are reflected or expressed adequately by others (such as their husbands), often this is not the case, and decisions are made that only reflect men's needs/concerns.

Further, where gender issues are considered, still they tend to be seen as simple 'gender relations' in terms of a potential or actual heterosexual relationship. The multilayered existence of 'gender relations' (e.g. between elder sister and her younger brother in the household which is an important relation for intra-household resource allocation) as well as the relations between women themselves e.g. in polygamous relationships, are overlooked. Alternatively, Mawaya and Kalindekafe (this volume) show how beneficial a good gender analysis of roles, responsibilities, decision making processes, relationships with natural resources etc. can be in contributing to a management plan for conservation of resources

The research also confirms that women tend to experience more negative impacts from environmental degradation than men (Girma *et al.* this volume; Mawaya and Kalindekafe, this volume). Naigaga *et al.* (this volume) showed that though both men and women are at risk from pollutants in the wetland areas where they work/visit, women tend to be of greater risk because they are less aware of the dangers and are under greater pressure to continue utilizing the wetland resources due to everyday and basic needs.

Naigaga *et al.* (this volume) highlighted that women more than men implemented conservation processes and supported/upheld protecting laws and activities in the wetland areas of Uganda, though men had more knowledge of the laws and were able to recite them by heart. And the women's group JUWVO was very active in implementing maintenance and conservation processes in collaboration with government authorities, despite the lack of respect given to the organization by local men and male wetland users. However often women may experience greater costs due to conservation processes, for example, by having to spend more time protecting crops from wildlife, whilst most wildlife-related jobs are given to men (Chisakawa *et al.* this volume).

All the studies argued that mainstream and particularly scientific or natural resource research still fails to adequately include social aspects including gender. All have gone a long way in their attempts to overcome this and ensured that at least in the studies detailed here, gender has become a central focus. The value of this has been proved, as Naigaga *et al.* (this volume) conclude, "It is necessary to understand the general characteristics of the respondents in order to examine the general aspects of utilisation, access and control of the wetland resource. This background information is crucial in formulating recommendations to officials responsible for the wetland and environment, and to the resource users for sustainable use. Such recommendations

guide policy makers to formulate guidelines that do not conflict with people's interests. This information is also important in developing projects that target the wetland users without raising conflicts of interest."

Recommendations and Ways Forward

Conservation and development interventions should, at the very least, attempt to 'do no harm' to gender relations amongst communities. More positively they should attempt to actively open up opportunities for greater gender equitable social change. As described above, many organisations (NGO and GO) are still struggling with how to achieve this. Equally, research organizations continue to struggle to include gender, particularly within the more scientific disciplines such as environmental and natural resource research. The contributions found in this volume have attempted to overcome these challenges and incorporate gender, albeit within a separate though interlinked set of studies. Lessons learnt from these studies and from other experiences have been used to develop the set of recommendations found below that suggest how to move forward. It should be realized however that all recommendations be adapted to the local context: what may work in one context may not work in the same way in another. As such, the recommendations should be viewed only as guidelines and more detailed local specific activities and support provided.

- i. A detailed gender analysis should be carried out ensuring that all involved in the project, management processes, etc. have a clear and equal understanding of local gender relations and issues. Gender analyses should be ongoing as needs require: they should not be seen as one-off but should be carried out as questions, problems, etc. arise. Gender analyses should be carried out in a participatory manner as a shared learning and exploratory, even experimental process, with communities (or other actors).
- ii. A sound rationale for focusing on gender issues, how and why, should be developed by projects/interventions preferably before design, or at the very least prior to commencement of activities. To what degree does the project want to see gender inequalities changed and once considered, how are changes to be promoted, who is to hold responsibility and how are further impacts to be managed, mitigated etc? Do we seek equality of opportunity – or equity of impact? Or both? Should gender equality be forced or should the project take a subtle approach and open up space for women to initiate change themselves. Can a focus on women and 'women's projects' be justified?
- iii. It is important to identify exactly which sections of society require assistance and develop support that fits and is accepted by them. It should be ensured that there is a commitment from local groups i.e. government and local communities (including the women themselves) for supporting change. There


- is a need for true representation of communities with specific attention to different gender groups. Further there is a need to strengthen community social communication mechanisms. This should incorporate strategies to improve access to information by all the gender groups (Chisakwe *et al.* this volume).
- iv. It may be necessary to create gender and environmental awareness among environmental management officials, among men and women users and institutional users of different resources (Naigaga *et al.* this volume). Without such commitment 'empowerment' and other social change is not going to occur; change has to come from within if it is to be sustainable. Women need to have confidence and faith in their fellow women leaders. It may take time for such confidence and commitment to be established, and support and activities may have to be adapted according to local needs and priorities.
 - v. Activities to support increased women's participation should be carried out hand in hand with the addressing of basic inequalities found in the local communities in terms of educational facilities, health care and property rights. Macharia *et al.* (this volume) stress a focus on women's access to and control of productive resources and benefits. Chisakwe *et al.* (this volume) highlight a rights-based approach requiring as a prerequisite rights being enshrined in formal institutional arrangements such as policies, laws and constitutions. Additionally ways to begin the process of longer term attitudinal and behavioural change should be supported i.e. a twin-track process taken. Where traditional (male dominated) institutions are being supported to manage NRM, it is likely to be necessary to look outside such institutions to find alternative forums for women to voice their needs, concerns etc. Ways to ensure communication and linkages between these forums and the traditional decision making institutions should be supported.
 - vi. Extension support for such as agriculture and aquaculture should be targeted at women as well as men, with an understanding of the different roles that men and women have in these productive systems and the needs that they have for support (Jutaisire *et al.* this volume).
 - vii. Women tend to feel more comfortable than men to form cooperatives and self-mobilize as a group to share responsibilities, provide support and perhaps to initiate change (Mawaya and Kalindekaffe, this volume). Women can see the advantage of 'group power'. Such groups are often of an informal nature and may not be readily visible. However, they can provide a strong basis on which to build cooperation and provide a good entry point for mobilizing women into a more formal or active institution. Single-sex groups may prove advantageous; however the implications on gender relations of such groups should be monitored.

Where women have been given long-term support, encouragement and opportunities to take a more active role in decision-making processes, they have slowly taken up the challenge. Often this has been assisted by key role-models who have led women's participation, as well as a reliance on group power. By focusing on user groups as the means for mobilizing communities in conservation and NRM, some of the social constraints that inhibit women's participation can be overcome. For example, it can prove less politically sensitive and more socially acceptable to bring women together because they are a user group (such as fuel wood collectors) rather than because they are women.

- ix. It is important to include a focus on the inclusion of the youth within NRM and environmental change: it is they who shall manage and protect the environment in the future and thus should be included in activities such as the development of management plans. Further they may be more open to change and/or the uptake of new technology than other groups in the community such as the elders.
- x. Commercial resource use should be balanced with community resource use. Often men control commercial use that generates income whereas non-commercial activities for household consumption are usually the preserve of women (Chisakwe *et al.*, this volume). Negotiation and conflict resolution processes may be necessary to ensure that all actors have a place to voice their needs, concerns, etc. and have an equal role in developing solutions and conclusions.
- xi. There is a need to review gender policies so as to integrate gender analysis in NRM research. Amongst other things, this will result in the enhanced adoption of new technologies in production systems (Macharia *et al.*; Girma *et al.*, this volume).
- xii. Adequate monitoring and adaptive management is needed. Change needs to be monitored, particularly that involving social (attitudinal and cultural) change. Negative consequences as well as positive may occur and action may be needed to mitigate them. There should be enough flexibility in project design to allow adaptations to take place. Community monitoring should be considered: a successful example of a CBNRM project that has initiated a women's monitoring system is the Community Resource Monitors Project in Namibia (see Flintan 2003).

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The goal of the research endeavours, and therefore of this book, was to build capacity amongst natural resource management (NRM) researchers, with emphasis on land and water management in the sub_region, and to document the processes and examples of best practice made by NRM researchers towards integrating gender analysis and participatory research.

Most development issues require interdisciplinary and participatory approaches in the design, monitoring and evaluation of research for development project and programmes because development, and especially NRM, is multifaceted. Resolving key development challenges, which usually engage different sets of technological, institutional and policy issues, therefore requires a variety of expertise and practical experiences. This book approaches development issues related to natural resources management from perspectives that recognise the mutually influencing interaction of society and nature.

The chapters in this book have attempted to overcome the gender biases found in most natural resource management (NRM) research and to suggest ways of studying gender and social challenges in development by adding a gender sensitive research dimension to already existing research programmes and activities, focussing on natural resources and their management. The contributions found in this volume fill major gaps in NRM research and provide detailed information on gender differentiated roles, responsibilities, access, control, contributions, and the different relations that men and women have with the environment and natural resources. This book will enable policy makers and stake_holders to make better_informed decisions concerning future natural resource management.