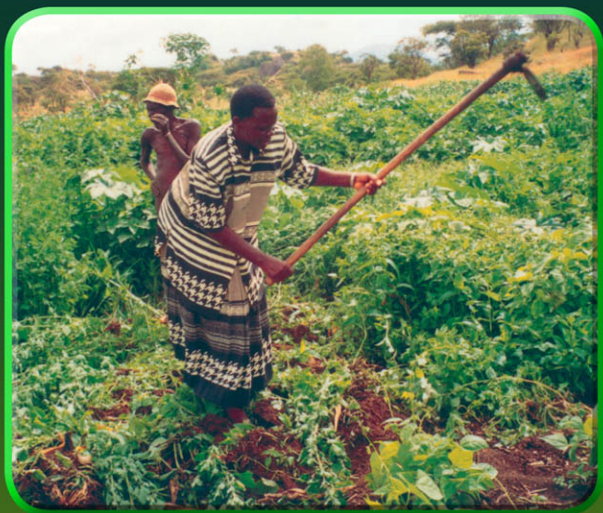


NATURAL RESOURCE MANAGEMENT

The Impact of Gender and Social Issues



Editors

Fiona Flintan and Shibru Tedla

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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 in the social sciences; to enable members to engage in collaborative research; and to facilitate the exchange of scholarly ideas and publications between individuals and institutions that teach or conduct research in various social sciences in the region.

This book is one of the outcomes of a series of research projects carried out through the sponsorship of OSSREA, with a grant provided by the International Development Research Centre (IDRC) of Canada. The overall objectives of the research endeavours were: (i) to build capacity amongst natural resource management (NRM) researchers, with an emphasis on land and water management, for the integration and practice of social/gender analysis and participatory research; (ii) to develop appropriate approaches to and tools for social/gender analysis and participatory research; (iii) to build capacity within OSSREA and partner organisations and institutions for mainstreaming gender in NRM research activities; (iv) to support and increase interactive networking and information exchange amongst NRM researchers in the sub-region with a focus on gender/social analysis and participatory research; and (v) to document the processes and good practices used by NRM researchers in integrating social/gender analysis, and to record research results. The goal of this book is to fulfil, in part, the achievement of these objectives.

Most development issues cannot be addressed from a single professional perspective or without the participation of the beneficiaries. Cognizant of this, there is wide agreement among researchers and development research managers about the value and importance of interdisciplinary and participatory approaches to the initiation, design, implementation, monitoring and evaluation of research for development projects and programmes. However, looking at the existing scenarios of research for development, one finds that such

research undertakings often tend to be sectoral and “researchers-driven”, with little participation by users of the research results.

Development problems are multifaceted and so are their solutions, which usually necessitate engaging with technological, institutional and policy issues – thus requiring multidisciplinary expertise and experiences for proper understanding and appropriate adjustments. This is especially true for developmental issues related to natural resources management that involves dealing with the interaction of humans and nature, i.e. of natural and socio-political systems.

The participation of beneficiaries and supporters of the research process is likely to ensure that the relevant research issues are identified, and that the efforts will be carried out in a more efficient and effective manner, since participation facilitates greater uptake of results.

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

Many research projects fail, however, to incorporate explicit attention to gender and to use multidisciplinary and participatory approaches. This is limiting the contribution of research to development and, as a result, to its own profile, which in turn limits the support research itself receives from governments and other donors. That is why this project focused attention on elements that add value to research for development – to develop capacity for and interest in research for development within the region.

The research described in this volume has attempted to overcome the gender-based biases found in NRM research and to meet 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 focusing on natural resources and their management. Most of these programmes had already commenced, but had left gaps in the area of social analysis, particularly relating to 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 on the different relations that men and women have with the environment and natural resources, including the different needs of men and women. This knowledge was seen as vital for better-informed decisions and recommendations concerning natural resource management in the future. Further, several of the chapters indicate how the different gender groups can be integrated into sustainable management of natural resources, based on their roles, relations and needs (see, for example, Mawaya and Kalindekafe in this book).

Developing the gender component for the research proved challenging, particularly in moving from merely looking at gender-related differences to investigating and understanding why such differences existed. Often, it was difficult to include women in the research—because of cultural constraints that prevented contact, or because the women were too busy, or perhaps because they did not have sufficient interest to attend necessary meetings or fill out questionnaires. Indeed, a limitation of most studies found in this volume too is that the women who were respondents were all 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, 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, Kabonesa, Okechi and Boera in this book). Methods used include KAP (knowledge, attitudes, and practices) assessment, 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 using these tools in opening up deeper and more complex discussions, on issues, such as access and control of resources, was recognised by many gender specialists working in

the areas of natural resources management, technical assistance, and development. For example, the resource mapping carried out by Mawaya and Kalindekafe and presented in this book highlighted the gender division of 'space' – women dominated the household and river "space", and men dominated the agricultural land and forest 'spaces' further away from home. Men's domination in these places was linked to their perceived roles as breadwinners and providers of shelter for the household. Both men and women tended to classify NRM in relation to the spaces that they themselves used, women talking more about river resources and men about forests.

Some researchers used triangulation to verify data and to ensure, as far as possible, that information was reliable. Both quantitative and qualitative data were collected. For example, Macharia *et al.* used a Partial Budgeting Model for the systematic analysis of agronomic and economic attributes of different low external fertility/conservation technologies, while Gross Margins Analysis confirmed the profitability of various technologies across different social and gender strata.

An effort was made to examine and analyse systematically the qualitative information as well as the quantitative. Rutaisire *et al.* describe the process: "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, and, wherever necessary, rearranged according to the appropriate part of the thematic framework to which they related. The data were also organised in the form of themes sought, with a view to providing explanations for the findings. Computer software SPSS VERSION 10.0 was used to analyse the qualitative data."

Several of the chapters focus on wetland and water resources. The chapter by Naigaga, Kyangwa and Mugidde describes their gender analysis of the utilisation of a wetland area of Uganda, dealing particularly with those activities that could degrade the environment and lead to risk of human exposure to chemical and/or biological

contaminants. The chapter by Mawaya and Kalindekafe also focuses on a wetland area of three riverine systems in Malawi, where no gender analysis had been carried out before. They sought to examine and establish ways in which gender could be mainstreamed into NRM in terms of access, control and management for sustainable livelihoods of different gender groups. A third study focusing on wetland resources is that by Rutaisire *et al.*, who investigated the utilisation of aquaculture in the Lake Victoria basin in Uganda, and aimed to generate information and propose methods for the integration of gender issues in wetland *Clariid* fish production and the acquisition of technology for their breeding in the Lake Victoria basin.

Girma, Belisa and Gudeta carried out a gender analysis of the social, economic and cultural factors that determine access to and control over resources in selected districts in Ethiopia. They investigated decision-making power regarding production, processing, marketing and utilisation in potato farming, aiming to understand the reasons for the non-adoption, or only partial adoption, of new potato production technologies in terms of gender and social interaction. Also Macharia, Kimani, Kimenye and Ramisch focused on agricultural production, specifically 'the uptake of soil fertility management technologies', based on farmers' social and gender differences, and the effect of such differences on the profitability of technologies for small-scale farmers in the central Kenyan Highlands.

We hope that NRM researchers will find this book useful and that they will continue investigating the issues that the chapters in this book have presented.

Shibru Tedla
IDRC Supported Projects Leader, OSSREA

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OSSREA,
Addis Ababa, Ethiopia

Acronyms and Abbreviations

ABS	Access and benefit sharing
AEZ	Agro-ecological zone
ADMADDE	Administrative management design
AIDS	Acquired immune-deficiency syndrome
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CAMPFIRE	Communal areas management programme for indigenous resources
CBD	Convention on Biological Diversity
CBNRM	Community-based natural resource management
CBO	Community-based organisation
CIAT	International Centre for Tropical Agriculture
CIP	The International Potato Center
DNFFB	Mozambique National Directorate of Forestry and Wildlife
ECZ	Environmental Council of Zambia
EEAU	Environmental Economics Society of Uganda
EIA	Environmental impact assessment
FGD	Focus group discussion
FHH	Female-headed household
FIRRI	Fisheries Resources Research Institute
GAD	Gender and development
GAF	Gender analysis framework
GDP	Gross domestic product
GED	Gender, environment, and development
GM	Gross margins
HIV	Human immunodeficiency virus
ICDP	Integrated conservation and development project
IDRC	International Development Research Centre
INM	Integrated nutrient management
ISFM	Integrated soil fertility management
IUCN	International Union for the Conservation of Nature

JMC	Jinja Municipal Council
JUWVO	Jinja Urban Women Wetland Organization
KAP	Knowledge, attitudes, and practices
KARI	Kenya Agricultural Research Institute
LH	Lower highlands
LM	Lower midlands
MAT	Mutually agreed terms
MHH	Male-headed household
MoA	Ministry of Agriculture
NARO	National Agricultural Research Organisation of Uganda
NEMA	National Environment Management Authority
NES	National Environment Statute of Uganda
NPWA	National Parks and Wildlife Management Authority of Zimbabwe
NRB	Natural resource base
NGO	Non-governmental organisations
NRM	Natural resource management
NTFPs	Non-timber forest products
NWSC	National Water and Sewerage Corporation
OSSREA	Organization for Social Science Research in Eastern and Southern Africa
PA	Peasant associations
PAM	Problem-animal management
PFM	Participatory forest management
PIC	Prior informed consent
PLAR	Participatory learning and action research
PLaW	People, Land and Water programme of IDRC
PRA	Participatory rural appraisal
PTD	Participatory technology development
R&D	Research and development
RDC	Rural district councils
SADC	Southern African Development Community
SDI	Spatial development initiatives

SFM	Soil fertility management
SOM	Soil organic matter
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan Africa
TBNRM	Trans-boundary natural resources management
TBNRMA	Transboundary natural resource management areas
TFCA	Transfrontier conservation area
TLAC	Transboundary Local Area Committee
TSBF	Tropical soil biology and fertility
TSBF-CIAT	Tropical Soil Fertility and Biology Institute of the International Centre for Tropical Agriculture
TT	<i>Tchuma Tchato</i> , Mozambican CBNRM programme
ULATI	Uganda Leather and Tanning Industry
UH	Upper highlands
UM	Upper midlands
UON	University of Nairobi
USAID	United States Aid for International Development
WED	Women, environment, and development
WID	Women in development
WHO	World Health Organization
ZAWA	Zambia Wildlife Authority
ZIMOZA	Region of Zimbabwe, Mozambique, and Zambia
ZNWA	Zimbabwe National Water Authority

1

Introduction

Fiona Flintan and Shibu Teda

The significance of gender

Gender has been shown to be a key determinant of rights to natural resources and to the benefits accruing from them (Watson 2005). It has been proved that gender relations have a direct impact on the use, management, and conservation of natural resources (Agrawal *et al.* 2006).

“Gender” has been part of the development and environmental agenda for over a decade. However, organisations still struggle to include gender into NRM in any meaningful way, and into NRM research and associated projects and activities. Gender tends to be put to one side as other “more important”, less sensitive, easier-to-deal-with issues are given priority.

Historically, NRM and other conservation processes have been dominated by men, and have their roots within the hunter-focused and, later, the preservationist-focused policies established during the colonial period (Said 1978; Grove 1995). The mutually supporting links between local communities and their environments, – including wildlife, were broken as powerful leaders, influenced by Western conservationist organisations, gave priority to the conservation of mega-species rather than to local livelihoods. People were alienated from policies and processes that had an impact on their land and their access to natural resources. As the conservation movement grew, local communities increasingly found their access to land and natural resources curtailed, and their role in decision-making diminished. Women in particular played little part in conservation processes, the movement being seen

as a “man’s world”. Where this world interacted with communities, it did so through local male leaders (McClintock 1995).

As conservation moved from being based on protectionism to becoming more community-focused and inclusive, the importance of involving 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 the broken linkages between the conservation of natural resources and people’s development (Western, Wright, and Strum 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 was explicitly recognised – their knowledge and experience, together with their role, both in destroying the environment and in protecting it.

As conservation policies developed, so too did theories on how best to achieve true community participation – including of women – which was 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: development processes did not sufficiently explain 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” then appeared as a priority, and thinking shifted to gender and development (GAD) and to gender, environment, and development (GED). This opened up more constructive opportunities for a better understanding of and engagement with women, gender relations, and environment. This change heralded a more radical 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 should be based on a clear understanding of relations, roles, responsibilities, participation in decision-making processes, and so on.

Such thinking made apparent the need for more gender-sensitive research, which, if successful, would provide the knowledge necessary for more informed and more effective interventions and activities. It was recognised by development actors that neglecting the gender component not only led to incorrect assessment of existing community institutions for NRM (in terms of participation, distributional equity, and efficiency), but also distorted the understanding of the human impact on natural resources, and led to the suppression of opportunities for forming and sustaining successful resource management groups through women's involvement (Naigaga, Kyangwa, and Mugidde, this book). Though such a need was recognised, insufficient gender analyses were conducted, and those that did take place lacked depth and recognition of the complexity of 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 regarding inclusive approaches has developed further and there has been a greater emphasis on a rights-based approach, directing action to address gender inequalities and in particular, focusing on and promoting women's rights and women's participation. This has also influenced NRM approaches including the development of CBNRM and its benefits, such as more secure access to and control of resources as independent rights. Chishakwe, Tandi, and Musiiwa (see this book) took a more rights-based approach to their research, identifying and proposing practical actions to address gender inequities in access to and control of 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 Organisation for Social Science Research in Eastern and Southern Africa (OSSREA), with funding from the International Development Research Council (IDRC), has been supporting six research teams carrying out comprehensive gender and social analyses within already existing research programmes.

The process started in 2004 with a training workshop for the research teams – 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 a competitive basis. The funds made available were to supplement ongoing NRM projects, to enable researchers to address gender and social issues. This enabled a gender dimension to be integrated into the research, and allowed a gender and social analyses of the major NRM projects to take place. These 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, which detail 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, and highlights the differences found between men and women in relation to the environment and natural resources and examines why such differences exist.

Gender-related differences in NRM

Collection and Utilisation

Both men and women utilise forests, wetlands and other ecological zones and their products in a variety of ways. These uses are influenced by gender relations as well as by age, ethnicity, socio-economic status, location relative to the forests, and exposure to and level of technology (Malhotra *et al.* 1993; Boffa *et al.* 1996; Ghatak 1995; Flintan 2003; Flintan 2004). Though men's use may be more visible and have a higher profile, women rely to a greater extent on forests and forest products for both basic and non-basic needs (Naigaga Kyangwa, and Mugidde, this book). Thus, when talking to household members about resource use, it is important for the researcher to discuss it with *all* members and not only the household head.

Women tend to collect natural resources closer to home, often opportunistically, whilst carrying out other activities, and can be considered to be "generalists". Some activities, such as fish farming,

are possible for women only if the resource (fish) is found close to home – because of women’s limited mobility (Rutaisire *et al.*, Chapter 6 this book). Women are more likely to work cooperatively to overcome the need for high input of time and labour, and collecting trips may be a social event. On Mount Elgon, Uganda, for example 40 per cent of women’s total labour time is spent within the forest (Scott 1998). There may be restrictions on women’s entry into forests, particularly alone; working together can overcome such constraints (Flintan 2001).

In Ethiopia, culture is a dominant factor that influences gender roles, responsibilities, participation, and so on. Jibat, Belisa, and Gudeta (Chapter 2 this book) highlight the influence of culture in defining livelihood and agricultural roles. Their study emphasises that we should not assume that gender roles are obvious; there may be changes or adaptation at a local level; and assumed roles may not necessarily fit our preconceptions. Other research by Flintan (2004) has shown that, in Southwest Ethiopia, specifically Bonga forest, cultural restrictions prevent women from collecting non-timber forest products (NTFPs); their husbands collect wild cardamom and firewood, which the women who then sell the cardamom and firewood in the market or use at home. However, in other parts of the region, particularly where coffee growing has increased exposure to traders, women have greater mobility and play a greater role in NTFP collection. Culture can help enforce other rules and taboos. For example, in parts of Kenya, there are taboos that prevent married women from planting certain 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 her house and overturn it (Mwangi and Houghton 1993).

Divorced, separated or widowed women may have greater freedom of movement than married women. In the wetlands of Uganda and Zambia, for example, unmarried women exploit the wetlands’ resources more regularly than married women, so their utilisation of this resource is greater than that of married women (Naigaga, Kyangwa and Mugidde, Chapter 5 this book; Chishakwe *et al.*, Chapter 7 this book).

In contrast, men tend to undertake planned, long-distance “collecting trips”. Men are more likely to be “specialists”. They tend to be more involved in cultural and commercial activities and less concerned with the domestic use of what they collect. Charcoal-making tends to be the responsibility of men, though the sale of charcoal can be dominated by women, particularly those from nearby towns. Hunting wildlife also tends to be a male activity (Mawaya and Kalindekafe, Chapter 4 this book). 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 the locations of secret hunting grounds (Leach 1999). A similar reason for keeping medicinal plant knowledge away from women is provided in Southwest Ethiopia: men hold the knowledge and pass it on to their sons, to avoid women disclosing secret recipes, cures and so on (Flintan 2004). Nevertheless, in other parts of Africa, women have been found to collect a variety of bush meat (Abuquah 1998; Hunter, Hitchcock, and Wyckoff-Baird 1990), as well as playing a large role in its trading (Tshombe *et al.* 2000).

Interesting work by Mawaya and Kalindekafe (this book) raises the reasons for the differently-assigned roles and responsibilities of men and women. Mawaya and Kalindekafe note that the community members they interviewed stated that the reasons were the cultural perceptions, beliefs, and customs inherited from predecessors; and the influence of local authority and government. Other factors included “nature” (the belief that God designed men and women to play the roles they play), a sense of duty (the feeling that the various roles women and men play are those they consider essential), and innate talent (the roles that individuals adopt are expressions of the skills they are born with). The availability of resources, and poverty, were also mentioned as reasons for roles differing according to gender.

Primarily, gender roles are maintained (particularly in rural areas) because everyone in local society believes that individuals must develop personally within their roles – both within households and in society. Gender roles are assigned according to perceived ability, including physical ability to carry out those roles e.g. to look after different types of

livestock. Those who contradict cultural norms and values in relation to gender roles and relations are seen as disrespecting the authority of the chiefs and elders; and are thus likely to be punished by the chief. Fear of being punished and ridiculed by society thus sustains the different gender roles. Punishment can take many forms and can be costly to the offenders (usually a fine imposed by the chief in the form of livestock, such as a chicken, a goat or a cow).

Roles are assigned at an early age, though fathers tend to be more proactive than mothers in assigning roles to children according to gender. Despite this, some men take on “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 Forest Products as a “Safety Net”

The use of forest and savannah products (including bark and seeds) for food or medicinal purposes is likely to increase in times of stress or insecurity, such as conflict, drought and food shortage. Wild plants are relied upon for their medicinal properties, especially at critical times when no alternatives are available. Women in particular rely on wild plants for household needs, and across rural Africa are the custodians of local knowledge of “wild foods” (Mawaya and Kalindekafe, this book). Natural resources are, therefore, of critical importance at certain times for people’s survival and make an important contribution to community safety-nets. More often than not, it is the poor who rely on such strategies, since they have fewer alternatives than those who are better off. It is important to recognise that although some natural resources appear to contribute little to people’s livelihoods from a quantitative perspective, they can make a critical difference between life and death in certain situations – particularly for the poor. Likewise, the income from selling NTFPs and other natural resources may make little proportional difference to 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 to and control of natural resources are both heavily influenced by gender and can be highly complex. As Chishakwe Tandi, and Musiiwa (, this book) explain: “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 own lives and those of their households and communities (Flintan 2003; Watson 2005; Muir 2006; Naigaga Kyangwa, and Mugidde, this book; Mawaya and Kalindekafe, this book; Chishakwe,, Tandi, and Musiiwa, this book). Women’s “entitlements” are lower than men’s (Macharia *et al.*, this book). In some countries, for instance Malawi, despite the fact that a man moves into his wife’s home, women view 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; that position remains unfilled unless they marry again (Mawaya and Kalindekafe, this book).

Women and their views and needs may be compromised by power structures which, in rural communities, are heavily biased in favour of the male. For example, if women are members of locally-based committees, they are usually “just” committee members or secretaries taking minutes, and rarely voice their own concerns. This can be due to cultural, political, and illiteracy barriers (Mawaya and Kalindekafe, this book). Additionally, constraints on women’s time often limit opportunities for their participation in public meetings (Vernooy 2006).

Because information is not always passed on by those attending meetings (more often the men), women often have a less than complete knowledge of environmental issues, including threats to the

environment – and indeed to themselves – that result from activities, such as the use of pollutants. Naigaga Kyangwa, and Mugidde (this book) show that in a certain group of men and women who have little awareness of the dangers of chemical contamination within the wetland they utilise 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.

Gender inequality over access to land is widespread. Many societies, regardless of whether they are patrilineal or matrilineal, confer only secondary, usufruct rights to women without entitlement to alienate or inherit it. In Malawi, even where women are allowed to inherit land, sell and rent it, it is the men who tend to benefit taking control of the money raised (see Mawaya and Kalindekaffe this book). In Zambia 30 per cent of the land is reserved for women, but it is very difficult for them to obtain title from the 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 was found that the amount women can access (and farm) tends to be much lower and of poorer quality than the land men can access and use (Rutaisire *et al.*, this book). 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 of government laws and regulations – a situation worsened by their high illiteracy levels (Chishakwe, Tandi, and Musiiwa, this book).

Women have been found to be the main farm operators; yet have the least say in use of farm resources. Furthermore, they have an even lesser say in the distribution of the benefits accruing from the investment of their time in 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, for instance through casual labour. Men are more likely to benefit from the adoption of new production technologies, and hence researchers and policy-makers must

pay attention to ending practices that tend to exclude women from controlling resources (Macharia *et al.*, Chapter 3 this book).

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 man, even if the blocks belong to his wife. A woman may be able to inherit rights to the block in the event of her husband's death and in the absence of a son, but yet this is likely to involve a fight with male relatives staking claims (Flintan 2004). Further she will need to avoid the system of levirate (where a widow is remarried to a brother of her deceased husband, not least to ensure that possessions/resources remain "in the family") (Flintan 2006). Similar systems may be in place to control rights to trees – for example, those needed for hanging beehives or for extracting timber from. Though women may need access to specific trees for specific needs, they have few, if any, rights: only men's rights are defined, as they are concerned with higher value and "more important" products. In Malawi (Mawaya and Kalindekafe, this book), at household level, women must seek access authorisation from men for the use of resources, but final authorisation for access to and use of forest products, wildlife and land resources rests with local authorities. Hypothetically, it can be argued 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 limit their ability to access resources and information. Unable to use land as collateral to obtain loans, women have difficulty in adopting new technology and hiring labour when needed (Sass 2002). This is confirmed by Mawaya and Kalindekafe (this book) who describe how women have to ask permission from men before accessing or using resources – because men control most of the resources, especially those offering higher economic benefits. In this study, women reported that they were sometimes denied access to certain resources, especially those with

good economic value; and that this limited women's ability to fulfil some of their needs, and negatively influenced their resource-based livelihoods. Consequently, women regarded resources monopolised by men as less valuable.

Findings indicate that agricultural productivity increases significantly when women farmers have access to and control of land resources (Mawaya and Kalindekafe, this book). Jibat, Belisa, and Gudeta (this book) highlight the importance of including women in the development of agricultural projects and interventions. Their study shows that where this does not happen, negative impacts are likely to follow, particularly for women. In the study area, need for women's labour had increased dramatically without significant economic or other benefits to women, because decisions which impacted on them were made without their input.

Changes in land use and arrangements for access to resources also have a direct impact on both men and women. Watson (2005), for instance, has shown that gender relations are always undergoing changes as men and women continue to haggle. "Gender relations are ... dynamic and changing as a result of processes of negotiation in response to changes in their environment." Men are more likely to make decisions about access, often undermining women's needs and views, and yielding to negative social consequences.

Marketing

Women, together with men, can play an active role in the trading and marketing of natural resources and agricultural products (see for example, Jibat, Belisa, and Gudeta, this book). However, participation, particularly that of women, may be limited by a range of factors including level of mobility and resource, cultural and religious constraints, and the type of task involved 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 demands constrain their ability to travel far (Kepe, Cousins, and Turner 2000; Monela *et al.* 2000), as do their lack of business and management skills (Flintan 2006).

In some situations, it may, however, 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 Southwest Ethiopia women help make, hang, and take down beehives, and they sell honey when permitted to do so by their husbands (Flintan 2004).

It should not be assumed, however, that if women are involved in the harvesting and sale of natural resources, then they are able to control the income thus raised; sometimes men will take control (see for example, Rutaisire *et al.*, this book). If a woman is able to keep her earnings, even though the income may be small, it may be the only means by which she can obtain cash that she has control over. Indeed, paradoxically, men are more likely to respect women if they raise monies that form a significant part of the household income (ABRDP 1999; Chishakwe, Tandi, and Musiiwa, this book). NTFPs in particular have been found to represent an important source of income and employment, particularly for women, encouraging increased production and harvesting for local trade (Marshall and Schreckenberg 2002).

Commercialisation

A number of complexly interrelated factors influence whether commercialisation will benefit or harm women’s (and indeed men’s) socio-economic status. These vary spatially, over time, and socio-economic development, and according to different stages of a woman’s life. But once women have invested money or energy in 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 zones and/or intensive agriculture. One feature common to many commercialisation programmes—for example of NTFPs—is an effort to improve processing technologies. This can

happen for a variety of reasons: to improve quality, to increase locally added value, to increase or accelerate product supply. Some studies of new technology introductions reveal a pattern in which men displace women from product 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 Rutaisire *et al.* (this book) highlights the fact that men involved in fish farming prioritised the financial benefits, whereas female respondents prioritised social aspects – nutritional improvements and social interaction. Further, a large proportion of the women interviewed (44.4 per cent) did not report any changes within the community attributable to fish farming, but most men (36.7 per cent) claimed that their income had improved tremendously since they commenced this farming.

Conservation and NRM

Involvement in Conservation and NRM

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 easy assumptions. Women tend to exploit resources for subsistence use; but men tend to exploit resources for commercial use. Women can be both nurturers of the environment and destructors (see examples from this book). Bookbook. Even though men tend to harm the environment more in a quest to make a profit (Shiva 1988; Merchant 1982), women struggling to help their families survive may also exploit the environment in unsustainable ways. Short-term needs tend to force women to take decisions that compromise the long-term protection of resources. As Mawaya and Kalindekafe (this book) describe, in Malawi women had exploited most of the natural resources in the study area to ensure food security in their homes.

It is likely that the needs of men and women will change over time. As Chishakwe Tandi, and Musiiwa (this book) show, when communities are very poor, the needs of men and women tend to be 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, such as participatory forest management (PFM) to work effectively, communities need to understand and support the link between conserving resources and their own development. Mawaya and Kalindekafe (this book) describe how those in the study areas in Malawi did not grasp the concept of long-term needs, but focused only on short-term needs, making concepts, such as long-term sustainable development difficult to promote and achieve.

Motivations to get involved in environmental management activities, whether agricultural production or conservation of NRM, will differ between men and women (see for example Rutaisire *et al.*, this book; Macharia *et al.*, this book). It is important to understand these differences so that appropriate influence on these motivations can be applied. It is necessary too to ensure that the environment provided will encourage both men and women to take part in conservation and natural resource protection. A deep understanding of these motivations will be needed before decisions on how best to do this can be made. Jibat, Belisa, and Gudeta (this book) suggest that the challenge is not to integrate women into new development and environmental processes, but to recognise that women are already principal contributors to the traditional economy and, through that recognition, to elaborate specific actions to increase women's productivity and their standard of living, whilst protecting natural resources. An understanding of the real situation is vital to any development effort.

Impact of Conservation and Management Processes

In general, conservation legislation and environment-protection 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 or similar institution (likely dominated by

men). Where women (and men) have traditionally used resources and now find such use restricted or prohibited, if no alternatives exist they will continue to try to access resources, either by finding another source or by taking high risks – resulting in verbal and physical abuse, or even imprisonment (Flintan 2001). Though it has been shown that women are more likely to obey laws (Naigaga, Kyangwa, and Mugidde, this book) they may be forced to break them when needing to access protected resources for basic needs, such as fuel wood. Here, women may operate under informal arrangements with local law enforcement officers who allow collection in return for money, goods or services.

At a policy level, such as at national policy level, gender issues tend to be mainstreamed (see, for example, the natural resource policies of Malawi: Mawaya and Kalindekafe, this book) and there is emphasis on the inclusion of women and on ensuring that benefits accrue to them. However, ensuring that policies supporting gender equity translate into practice remains a challenge. As Chishakwe Tandi, and Musiiwa (this book) describe for the water sector in southern Africa, though gender equity is highlighted in policy 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, and patriarchy inhibits the effective participation of women in formal institutions for the management of water resources.

Non-governmental organisations (NGOs) and governments have realised the importance of NRM and its contribution to and relationship with development processes. However, though it has been proved that gender is an important factor (not least for the reasons discussed earlier in this chapter), gender continues to be sidelined, and organisations struggle to make any meaningful progress to include women. This has resulted in a number of negative impacts, both on conservation and on the livelihoods of the rural poor. These impacts are discussed in the following chapters and the case made for the greater inclusion of gender issues within NRM research and analysis.

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2

Promotion of Participatory Technology in Potato Farming–Ethiopia

Girma Abera Jibat, Mathewos Belisa, and Hailu Gudeta

Introduction

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

Over the past 50 years, poverty, particularly rural poverty, has become more severe and more commonplace, and the country's agriculture has been in steady structural decline (Rahmato 1991). This is evidenced by recurrent mass starvation, loss of livelihoods and ecological degradation, as marginal lands have come under cultivation in order to feed more people.

Ethiopia has a diverse agro-ecology and soils that are suitable for cultivating a wide variety of tropical and sub-tropical crops as well as for rearing 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 has been undertaken, and the new technologies thus developed are continually

being introduced into the agricultural system. However, the expected 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 and their social status, and gender-related agricultural production constraints. The roles and responsibilities of "household family members" are never seriously addressed by agricultural researchers in the development of agricultural technologies.

Gender gaps in resource access and control remain widespread; compared with men, women, and children have less access to resources and less control over them. 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).

Understanding gender roles and responsibilities in agricultural production and decision-making plays a 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. All gender groups have the right to share the benefits derived from improved technologies in agricultural development. So gender issues need be properly understood, and properly addressed, if the results of agricultural research are to be utilised effectively and efficiently (Chiche 2000).

In Ethiopia, women participate in all types of agricultural activities in crop, livestock, and NRM. Women farmers provide 50 to 80 per cent of the total labour input required for crop production and 77 per cent of the labour input required in livestock production. Female farmers are also involved in off-farm income generation, despite their considerable household responsibilities (Chiche 2000). It is thus imperative to recognise that women 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 women's productivity can

be appreciated and subsequently assessed. Recognition of gender roles is vital to any development effort, including agricultural technology development.

The adoption rates of generated technologies in Ethiopia have been slow, resulting in low productivity. This might be due to inadequate knowledge of farmers' circumstances on the part of those developing new technologies, thus constraining the dissemination and use of the said technologies. In addition, the Ethiopian Agricultural Research System has failed to appreciate newly emerging thinking, including gender perspectives. Addressing the needs of gender groups 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 is inadequate. Women perform a number of productive, reproductive and community roles in rural Ethiopia, and these contributions are not recognised. A major objective of the present undertaking, therefore, is the identification of various gender roles in agriculture as part of NRM. The research also tries to elucidate how the different gender roles played by rural farm households impact on their respective access to and control over resources and status of decision-making power, with particular emphasis on potato production.

The research undertaking complemented 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 for Strengthening Agricultural Research in Eastern and Central Africa/International Potato Centre (ASARECA/CIP) housed at Baco Agricultural Research Centre.

The major project was originally implemented in four districts: (i) Jimma Arjo and (ii) Jimma Hooro districts in East Wellega Zone and (iii) Cheliya, and (iv) Jeldu districts in West Shewa Zone. The present project, however, covered an additional district, Jima Rare, that is located in East Wellega. These five districts have high potential for

potato production, and, as elsewhere in Ethiopia, farm work in these districts 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. This study was therefore formulated to examine and analyse gender roles and responsibilities, and the social and economic factors that might influence promotion of potato seed production technology 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 to 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 in the production, processing, marketing and utilisation of the potato crop; and (iii) to understand the reasons for non-adoption or only partial adoption of available potato production technologies, with particular regard to the role of gender and social interaction.

Conceptual framework

Gender and Sex

Gender refers to the differences between the sexes produced by social construction. It is a biological fact that a woman can give birth to 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; they 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) reports that women have less access to education and health care and fewer economic opportunities. Women are less mobile

and tend to be most active around the household. Even though they are usually responsible for physically managing household cash, they tend to have less decision-making power in its utilisation. They lack access to resources, such as land and capital. In addition, low self-image and lack of confidence amongst women are contributing factors to their lack of involvement in decision-making processes (Flintan 2003). The present study attempts to clarify whether or not this state of affairs, as it relates to potato production, is prevalent in the project area.

Gender Analysis

Gender analysis is an approach that aims to make explicit the ways in which men and women, male and female household members, relate to each other in terms of roles and responsibilities, access to and control of resources and benefits. It 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. Gender-based analysis leads to the identification of the extent to which rights are enjoyed and exercised—rights, such as participation in decision-making, access to and control of resources, equal opportunity, and equity between men and women.

Background

Gender and Household in African Agriculture

The contributions of women in Africa to agriculture-related work, such as harvesting and food processing are better recognised and accounted for than their contributions in 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 the 'fact' that men and women had defined divisions of labour in agriculture. However, studies showed that a variety of labour and cultivation patterns exist in Africa, as elsewhere in the world (Spring 1994; Wiedemann 1987). In postcolonial Africa, and elsewhere, agriculture has become a predominantly women's endeavour, since men often

migrate out in search of wage employment and are also often engaged in counter-productive activities, such as war (Spring 1994). Sex ratios of working-age people in rural areas of many African 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).

A clear understanding of who undertook which 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 to improve agricultural production, high-yielding varieties or more intensive cultivation or processing methods were introduced – requiring more labour than before for crop planting, harvesting, processing and storing; this extra labour-intensive work invariably fell to the women (Rogers 1980; Ferguson and Horn 1985; Feldstein and Poats 1989).

Gender-based Labour Division in Ethiopian Agriculture

In Ethiopia, the gender division of labour varies depending on farming systems across cultural settings and locations, and on levels of wealth and prestige. Rahmato (1991) noted that peasant women in Wello have greater decision-making powers than women in Welaita in terms of cultivation, land use, and cropping plans, all of which were generally considered as male spheres of influence. In Wello, men plough and sow, and women are responsible for other aspects of cultivation. He argues that in Welaita, women did little other than carry animal manure to the ploughed fields (although female household heads perform many agricultural tasks). They are also heavily involved in marketing grain and horticultural and other produce including livestock.

Comparing *enset* production with *tef*⁶ and maize production in northwest Welaita, in terms of gender differences in labour and decision-making, Sandford and Kassa (1993) noted that those who did the work made the decisions. Women carried out much of the labour for *enset* production and made decisions on the choice of varieties and the distribution of produce. They did little in the cultivation and harvesting

of tef, which were handled by men, who therefore controlled its sales. However, women processed the *tef* that is consumed at home, and might sell any surplus *injera* (fermented bread). Men also dominated the production and sales of maize, although all household members were engaged in harvesting it.

Sandford and Kassa (1993) also argue that location of the fields influenced women's labour contribution and subsequent control. *Enset* gardens were usually close to the homestead and maize fields were often nearby, but *tef* fields tended to be far from home. When both men and women were engaged in the management of sales of agricultural produce, women managed sales of small amounts of agricultural products sold at local markets, while men sold larger amounts at distant markets.

FARM-Africa (1992a) found that in some areas of Ethiopia women did not participate in crop production. Working in the fields was considered improper for women and thus no self-respecting husband or father would let his wife or daughter work on crop cultivation (FARM-Africa 1992a). In Kindo Koysha, for instance, women's farm work consisted of cultivating vegetable gardens, *enset*, and cutting, collecting and carrying grass for livestock feed (FARM-Africa 1992b). Women also processed and sold butter, cheese, *injera*, *borde* (a weak local beer), and *arake* (a distilled spirit drink).

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

Methodology

Detailed background information on gender and gender relations in agricultural production, marketing of produce, and land titles is necessary to appreciate gender-related rural development constraints, including constraints on the transfer of technology. The data generated by this study went beyond the framework of the then-ongoing agricultural project, without undermining gender and social issues within the project framework. Data gathering covered gender-related issues impacting not only on the dissemination of potato production technology but also on agriculture in general within the study area.

Description of the Project Area

As already mentioned in the Introduction the project area comprises five districts, (i) Horro, (ii) Jimma Arjo and (iii) Jimma Horro in East Wellega Zone and (iv) Cheliya and (v) Jeldu districts in West Shewa Zone, all in Oromia Regional State (Table 2.1). Large portions of these districts are considered highland, and potato usually performs well in the temperate climate of the highlands of Ethiopia.

The topographical features of these districts represent wide elevations that enable the districts to contain three agro-ecological zones: (i) *dega* (highland) – areas with altitude more than 2200 metres above sea level (masl), (ii) *weyna dega* (mid-altitude) – areas with altitude 1800 to 2,200 masl, and (iii) *kolla* (lowland) – areas with altitude less than 1,800 masl (Table 2.1). All the districts receive unimodal rainfall, and agriculture (crop production and livestock rearing) is the major activity.

Table 2.1. Proportion of land areas, based on traditional agro-ecological classification

Study district	Zone	Agro-ecology			
		Total hectares	Lowland %	Mid-altitude %	Highland %
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—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 per cent of the arable land of Jeldu district is suitable for rain-fed potato production. At the time of the study, Jeldu district had become the centre of highly dependable clean potato seed production in the country.

East Wollega Zone is another very productive area. It covers 17 districts, most of which are food self-sufficient. Of these, three districts, i) Horro, ii) Jimma Arjo and Jimma Rare are localities with very high potential for potato production.

Collection and Analysis of Data

Primary data were collected using different participatory rural appraisal (PRA) tools: focus group discussions, key informant interviews, activity profiles, access and control profiles, wealth ranking, and household surveys. Secondary data were collected from Agriculture and Rural Development Offices of the respective districts, as well as from Holetta Agricultural Research Centre, where research on various crops including potato is carried out.

Non-structured and structured questionnaires were developed and used, for key- informant/group discussions and formal household surveys, respectively. The general agricultural data was collected from 20 peasant associations (PAs) selected using purposive sampling technique. Three PAs were from Cheliya, two from Jeldu, six from Horro, six from Jimma Arjo, and three from Jimma Rare. Specific socio-economic data related to potato production were gathered through a survey; 275 sample households including men and women were interviewed from three of the districts, namely Horro, Jimma Arjo and Jimma Rare (Table 2.1). Key informant interviews were carried out in all of the five study districts.

Informants were knowledgeable and experienced male and female agricultural extension experts. Group discussions, analysis of activity profiles 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 levels, and marital and social statuses were included during both interviews and group discussions. Male and female group discussions were done separately to avoid cultural barriers; in rural Ethiopia women rarely express their views in the presence of men. The primary data were analysed by simple descriptive statistics using the SPSS programme.

Results

It was found that gender roles and responsibilities were highly influenced by education level, age, religion, ethnicity, and wealth status, as well as by some other factors.

Headship, ethnicity and gender equity

Male-headed households (MHHs) constituted 80.4 per cent in Cheliya, 89.5 per cent in Horro, 67.0 per cent in Jeldu, 89.9 per cent in Jimma Arjo and 86.6 per cent in Jimma Rare (Table 2.2). Of all the districts studied, Jeldu district had the highest percentage (33.0) of 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 the understanding of gender equity – in terms of, for example, equal labour share, equitable share of resource use, and decision-making in almost all matters within the household.

Table 2.2. Proportions of male and female population in the study districts

District	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
Jeldu	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: Ministry of Agriculture and Rural Development, various reports for Cheliya 2003; Horro 2004; Jeldu 2003 and Jimma Arjo 2004.

In the study area, Oromos accounted for a substantial proportion of the population (95 per cent in Cheliya, 95 per cent in Horro, 99.99 per cent in Jeldu, 95 per cent in Jimma Arjo, and 98.8 per cent in Jimma Rare). The study identified ethnic variations in gender discrimination. For example, in Horro district a female 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 outsiders, because of gender discrimination. In the past, women seldom participated in official and social gatherings. If, by any chance, women attended such gatherings, they spoke very rarely and made no input into the decision-making processes.

Religion and Gender Equity

The people living in the study areas are followers of Orthodox Christian, Protestant, and *Waaqeffannaa*⁴, and there were a few Catholics in Cheliya and Jimma Arjo districts. There were very few Muslim residents in most of the highlands in the study area. Religious practice is dominated by two Christian denominations, Orthodox Christianity (65 per cent) and

Protestantism (35 per cent). The Protestant and Catholic denominations appear to offer better opportunities for gender equity and equality than does Orthodox Christianity.

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

Some of the respondents reported that certain religions prohibited men from working on special holidays. For example, in Horro and Jimma Rare districts, Waaqeffannaa belief prohibited men from working on *Garanfasa* or holy days. On such occasions, women, in addition to their regular responsibilities, took on work that was traditionally allotted to men. Similarly, Orthodox Christians did not work on certain "saints' days" and those not following Orthodox Christianity were frowned upon by Orthodox Christians if they worked on such days. It was a strong tenet of faith of the Orthodox Christians that disasters, such as hailstorms, strong wind, lightning or flooding would occur, destroying crops and livestock alike, if anyone in the community, male or female, were engaged 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. Age, however, was apparently correlated with type of religion practised. The elderly, both men and women, tended to adhere to either Waaqeffannaa or to Orthodox Christianity, while a large proportion of girls and boys tended to follow Protestantism, irrespective of the religious affiliations of their parents.

Education and Gender Equity

There was an apparent difference between the education levels attained by males and females in all the study districts; because of deep-seated

traditional influences, males were better educated than females. Communities culturally accepted the local saying *Dubarrii manaa baate jennan warraa baate jedhani*, which translates as “Once females go out, they will not come back”, and it was culturally taboo to send girls to school. It was presumed that if girls went to school, they would be exposed to social evils, such as sexual harassment. In general, there was better gender equity in households where the household head had been educated.

Family Size, Health and Gender Equity

Child and maternal mortality rates were high in the study districts. Despite this, family sizes ranged from five to ten, and the average was seven, indicating high fertility levels. The respondents were very aware of the population increases resulting from the inadequate family planning, and they reported that rapid population growth was a source of social pressures. All the same, household heads would still like to have as many boys as possible, hence the high number of offspring. Birth control was rarely practised.

Large population size impacts negatively on access to social services, food security, health care, and available arable land, as well as on general economic development (Figure 2.1). The general health status of the population in the study area was rather poor as indicated by the high maternal and child mortality.

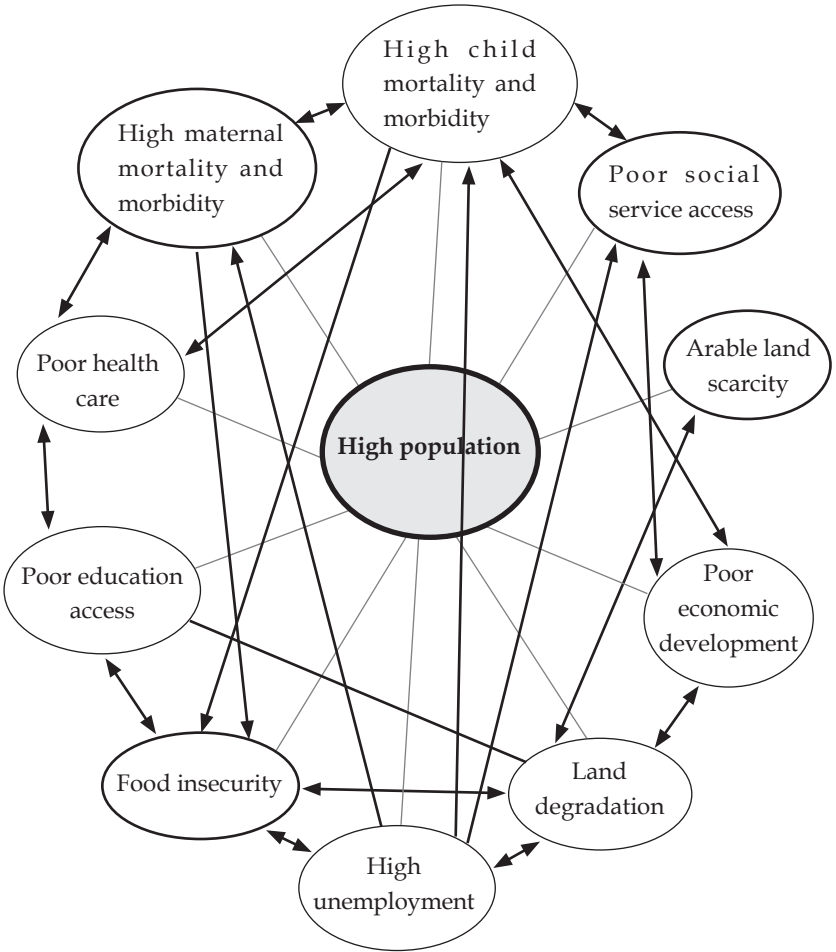


Figure 2.1. Relationships between population increase and social conditions

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

There was no apparent gender-related difference regarding access to health services. However, it was observed that women were more vulnerable to health problems, because of their reproductive roles, and perhaps also due to their having less access to financial resources than men did.

Migration

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

Land Tenure

Land tenure refers to land-holding rights, including land passed on through inheritance, rented for an established exchange value, or through an outright sale (the last of these is illegal). Land entitlement of farm households has a gender bias, since, in most cases, females traditionally do not inherit land as lineage members. Rather, they obtain land as wives through their husbands' lineage. Likewise, land distribution by government favours men; married women do not have the right to own land. In Ethiopia, all land is government and public property; ownership lies with government and people have use-right. Such use-right is bestowed on women only when they are widowed. In the study districts of Oromia, land ownership has therefore been traditionally accepted as a completely gender-determined phenomenon. The practice is also common elsewhere in Africa (Flintan 2003).

Land- Use System

In the entire study districts, the land-use system operated under traditional mixed crop-livestock farming system. The land-use system of farm households could be broadly classified into crop production, livestock production, and tree plantation. On average, crop production occupied the largest proportion of the land, followed by livestock production and tree plantation. 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 irregularly distributed over the districts.

Farmers were found to have planted trees primarily for construction and fuel-wood purposes, as boundary plants on crop land or woodlots on small plots of land, and often as homestead plantations. Establishment of homestead plantations with pure eucalyptus stands was commonplace.

Management of land was the responsibility of the household heads, who were predominantly men: 80.8 per cent in Cheliya, 89.4 per cent in Jimma Arjo and 86.6 per cent in Jimma Rare. It was further noted that, because of limited control over the resources, there could be a negative impact on the efficiency of resource use—the skilled and energetic household members, that is young boys and girls, who did not have control over the resource, are seldom allowed to use the land in creative and innovative ways. In some highlands in the study districts, for instance in Jimma Arjo, land was largely owned by elderly people, while the young who would have worked the land energetically and consequently improved agricultural production and productivity, were landless or held only very small plots of — less than 0.25 ha per household.

The Roles of Age and Sex in Physical Activities

Across all the study districts, girls invariably started work-related physical activities earlier than boys. Children younger than seven years of age and aged people, above 60 years, were considered incapable of undertaking agriculture-related physical activities, while those in the 8 to 60 year age group were considered capable of performing 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 stopped at about 60 years, probably because of long years of domestic drudgery. 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—on average 16 to 18 hours per day—than men, who worked 8 to 10 hours per day. Even though women become less active at an earlier age, they do not cease to labour before they can no longer manage it.

The study revealed clearly that gender discrimination began at an early age. Girls were considered as adults at a younger age than boys. Girls were often required to be obedient and to stay indoors helping their mothers. Even if females enrolled in school, they still faced enormous workloads at home when they returned from school. In addition, teachers were not supportive and hence girls were less likely to succeed in their schooling.

Asset Ownership and Power Control

The use and control of rural assets, including land, livestock, tree products, seed and crop produce, belonged to the household heads who in the majority of cases (80.8 per cent in Cheliya, 89.5 per cent in Horro, 67 per cent in Jeldu, 89.9 per cent in Jimma Arjo and 86.6 per cent in Jimma Rare), were men (Table 2.3). Other household members had only nominal access to these resources—giving males much more privilege than females. However, there was no difference in the size of land-holdings between MHHs and FHHs as land distribution took place only once, during the military government a decade and half before this survey. On the other hand, FHHs complained that their MHH neighbours often pushed them off their arable land, pasture land and forest land into marginal lands. FHHs reported that if they left their land fallow for a time, it would be claimed by men.

The average land-holding was seven hectares per household across the districts, ranging from 0.5 ha to 12 ha, although land shortage was critical in Cheliya and Jeldu districts. Livestock populations, comprising all types of domestic animals, varied from 8 to 32 per household in all the study districts. Cattle rearing was mainly men's domain, while looking after chickens, and sometimes small ruminants, was the task of women and/or young members of the household.

Table 2.3. Farm household access to and control over resources

Types of resources	Accessible to	Controlled by	Influencing factors
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

Sources: key informant interviews and group discussions, September 2004.

* M: men, W: women, B: boys, G: girls

Land use was also controlled by the heads of the households. Few household heads allowed the participation of other household members in decision-making regarding land use. Men were often afraid that, when their children grew up, the children, along with their mothers, would take control of the resources (assets). The participation of household members in decision-making regarding agricultural land use thus did not exist, and young members of the household considered themselves outsiders and did not involve themselves in planning and/or implementing agricultural development activities.

Access to Credit and Extension Services

In principle, there were no disparities between MHHs and FHHs in terms of access to credit or extension services. There was no policy or legal instrument that barred women from access to credit or extension services in rural communities, as long as they were legally married. The law, however, did not state explicitly that wives and husbands have equal rights regarding the control and use of land resources, or

access to credit and extension services. In fact, considerable differences were observed between the two gender groups in their participation in extension services. For example, in Jimma Arjo district, during the 2003 cropping season, 5,665 MHHs (51.4 per cent) and 316 FHHs (25.6 per cent), participated in extension services.

The probable reason why FHHs had poor access to credit and extension services could be that women were too shy to communicate with extension agents, most of who were men. Also failure to participate in different official and local meetings and lack of opportunity or time to listen to radio programmes when relevant information was being broadcast, might have contributed to lack of access to extension services, as well as to credit services.

Despite the fact that women contributed substantially to the management of livestock, extension services were not rendered to women. Invariably, men participated in informal training whenever it was provided to rural communities. **Household Level Food Security**

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

Production of Major Crops and Factors Limiting Production

Key informants in this study reported that no difference existed between MHHs and FHHs in the production of major crops. Barley, wheat, potato, faba bean, field pea, rapeseed and linseed were the major crops produced by both MHHs and FHHs in the communities of Cheliya

district. The major crops grown in Jeldu, Horro and Jimma Arjo districts by both MHHs and FHHs, in order of importance, were wheat, barley, *tef*, faba bean and field pea. The major crops produced in Jimma Rare by MHHs were wheat, maize, *noug* (nigerseed), and linseed, while the major crops produced by FHHs were maize, *tef*, and wheat. MHHs and FHHs were, however, reported to differ in their objectives in producing these crops. MHHs produced major crops both for 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 also differences in the factors limiting production of major crops in the area. In MHHs, limiting factors were, in order of importance, small size of land-holdings, bad weather conditions, high price of fertilizers, market fluctuation, lack of appropriate and timely delivery of technologies, and lack of knowledge. In FHHs, factors - limiting production were, in order of importance, lack of credit, shortage of labour, bad weather conditions, the high price of fertilizers, market fluctuation, lack of appropriate and timely delivery of technologies, and lack of knowledge. FHHs did not consider the small size of land-holdings to be a major constraint—perhaps because of the shortage of labour for ploughing and fencing, both considered by the FHHs as critical needs.

Potato Production and Factors Limiting Production

MHHs and FHHs both had similar perceptions regarding potato production compared to production of other crops. Potato production was accorded the first priority for the contribution of potato to food security, its market value, and its double-cropping advantages, in addition to its versatility in different dishes.

For MHHs, limiting factors on potato production were market fluctuation, lack of cooperatives, and lack of training in potato production and storage techniques. In FHHs, shortage of labour for fencing and ploughing, market fluctuation, lack of cooperatives, and lack of training in potato production, storage and utilisation were reported as limiting factors.

There existed differences between MHHs and FHHs regarding the types of local strategies employed to mitigate the factors limiting 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, if they had their own oxen, FHHs hired labour to do the ploughing, and gave their land for sharecropping if they did not—to circumvent the lack of labour force required for ploughing.

MHHs and FHHs in ASARECA/CIP-assisted potato project districts produced the same varieties of potato. Both MHHs and FHHs used improved varieties. Reasons given for this were primarily because of improved varieties' high contribution to household food security, their high yield and high market value, their resistance to diseases, and their pest tolerance—all qualities that were not present in the local varieties, but considered important by both MHHs and FHHs.

Farmers, irrespective of gender, reported that they employed different indigenous (not generated by research, but are from the indigenous knowledge of the people in the localities) strategies to overcome most of the potato production constraints. Examples of these strategies were using trap plants for the control of insects, especially red ants; land renting and share cropping to overcome land shortage; on-farm selection of healthy and high-quality seeds, and sometimes the purchase of seeds from local markets to overcome lack of improved seeds; and fencing and guarding to reduce depredation by wild animals.

The major seed sources for potato varieties were the open market, agricultural research stations, and 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 seeds produced on-farm by neighbours.

Household Wealth Status

Farm households were categorised as poor, medium or rich, based on land holding size, livestock ownership, number of oxen, annual produce (by mass), improved technology uptake potential, and type

of house(s) owned (thatch or corrugated iron sheet roof) (Table 2.4). Based on these criteria, the farm households of Jimma Arjo highland peasant associations were categorised into rich (10 per cent), medium (60 per cent), and poor (30 per cent). Most of the rich households were headed by men.

Table 2.4. Wealth status criteria for farm households (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 • Year-round food insecurity • Poor general sanitation, and unhygienic feeding practices, in particular • Inadequate clothing • Children do not go to school • Poor land management • No technology adoption • Many family members too young or too old to work 	<ul style="list-style-type: none"> • 0.5 ha of land • 1-5 sheep • A single ox or a pair of oxen • Some of the children go to school • Five months of food self-sufficiency per year • Adequate toilet facilities • Medium housing (maybe iron sheet or thatch) • Medium family size • Aims to be rich 	<ul style="list-style-type: none"> • 3 ha of land • 10 head of cattle • 4 pairs of oxen • 10 quintals⁵ of produce • Food self-sufficiency, surplus for sale • All the children go to school • Good toilet facilities • Corrugated iron sheet roofing • Good technology adopter • Risk-taker in technology adoption

Soil erosion, Degradation and Conservation Strategies

Most of the highlands of western Oromia are vulnerable to soil erosion as a result of the absence of permanent soil conservation structures, improper and continuous cultivation, erratic and/or intense rainfall, and indiscriminate clearing of vegetation cover. Potato cultivation—some varieties more than others—contributed to soil and water conservation, thus inhibiting soil erosion. However, this was limited to potato plots and small down-side (lower slope) plots. Traditionally, different conservation methods, such as terracing, contour ploughing, tree planting, establishing grass strips, ditches, and gully checks were reported as strategies employed by both MHHs and FHHs.

Gender-Differentiated Roles in Agriculture

Members of the households (men, women, boys and girls) in all the study districts had defined responsibilities in agricultural production activities. Ploughing was generally regarded as a duty of men and boys, while activities like milking, barn sanitation, and managing poultry were responsibilities of women and girls. Weeding, harvesting beans and flax, and collection of harvested crops were handled mainly by women, with some support from men and boys. In the absence of boys, girls were involved in herding 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.

Women were thus responsible for land preparation, weeding, hoeing, taking harvested crops from the fields to the threshing areas, barn sanitation, poultry and sheep production, and herding of small animals (sheep and goats), and feeding of milk cows and their calves, goats' kids and lambs, as well as caring for sick animals.

Both males and females were involved in feeding and guarding livestock, as well as in the collection, storing and marketing of crops. Horticultural production of crops, such as onion, fenugreek, red beet and head cabbage, wherever they were produced, was regarded as a purely females' activity.

All members of poor farm - households might be engaged in crop production as hired hands, while only boys might be involved in livestock rearing. Off-farm activity like petty trade was usually practised by all members of the household irrespective of sex or age, especially in poor farm - households. Livestock trade was carried out by men, blacksmithing by men and boys, pottery-making mainly by women, and lumbering by men. Preparation of local drinks, such as *arake* and *farso* (local ale) mostly for sale, was by women and girls, again especially in poor farm - households.

Of overall farm-related household activities, crop production required the largest average share (45 per cent) of the time, followed by domestic chores (30 per cent), and livestock production (25 per cent). The average overall contribution of women accounted for 36.0 per cent of farm-related household activities, that of men 35.2 per cent, while the rest 29.7 per cent was shared by the children.

Gender-Differentiated Roles in Potato Production

Gender-disaggregated roles and responsibilities of household members in agriculture were investigated in three districts of East Wollega and two districts of West Shewa Zones, both in general, and in particular regarding potato production, utilisation, and marketing. The time allotted (as a percentage) to each activity was also broken down between the different gender groups.

Traditionally, potato and other horticultural crops, such as onion, garlic, cabbage, fenugreek, red beet, carrot, and pepper have been regarded as women's crops – probably based on the proximity of the sites of production to the homestead. The study revealed that females 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 per cent) than males contribution (27 per cent) (Table 2.5 and Table 2.6).

Table 2.5. Gender-based labour contributions to small scale potato production

Type of activity	Percentage share (rounded)	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	20
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 2.6. Roles and responsibilities, across the study districts, in potato cultivation

Type of activity	By who	When	Reasons
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	From 2 to 4 weeks after planting, depending on rainfall and crop variety	Efficiency and effectiveness, men's participation in other activities

Earthing up/hilling	W, G, B	After two times of weeding, depending on rainfall	Men's participation in other, similar field activities
Disease identification	W, M	Between seedling emergence and full flowering	Men have rich experience and joint responsibility
Disease control	M	Between seedling emergence and full flowering	Culture, and better 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 wildlife: 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/utilisation	W, G	After harvesting	Culture and experience

Marketing	W, G, B, M	End of June to Sept. After Jan. for seed	Efficiency and effectiveness
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Sources: Key informant interviews and group discussions, September 2004.

* M: men, W: women, B: boys, G: girls

Land Preparation

Land preparation refers to clearing, ploughing, disking (shallow ploughing), levelling, breaking down of large clods, removal of remnant stalks and non-decomposed crop residues and weeds, applying household garbage or compost or farmyard manure. It also includes making the soil very smooth and fine for seed tubers, and the preparation of seedbeds, rows, and ridges or furrows where potato seed tubers are to be planted.

Ploughing activities in potato production were the responsibilities of men. Men made rows for planting with the help of oxen ploughs; while women, girls and boys were engaged in planting potato tubers, removing remnant stalks, breaking down large clods and other activities that are part of good land preparation for improving germination and establishment of the crop.

Potato plots that were repeatedly ploughed during the dry season were free from weeds. Early potato maturity allowed most potato plots to be double cropped. This had two advantages: i) more food was produced per unit of land, and ii) insects and pests were controlled better as a result of repeated ploughing. Ploughing is carried out mainly during February and March.

Ploughing is an activity reported to be handled only by men, sometimes supported by able-bodied boys. The reasons reported for this were men's rich experience of ploughing, their physical strength, and a culture of not involving females in ploughing.

Site Selection and Production

MHHs and FHHs' choices of sites suitable for potato production in terms of soil fertility, proximity to homestead slope and precursor crops were similar. Both MHHs and FHHs preferred black and fertile soils near the homesteads. Winter barley (*garbuu birraa*) was reported as a preferred crop for double cropping with potato.

Both MHHs and FHHs undertook seed selection and were equally conversant regarding this issue. Men participated more in seed selection compared to other members of the household, even though women, boys and girls also participated in both seed selection and the storage of selected seeds. The time of seed 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. Among the different potato varieties, good quality (in terms of tuber size, taste, shape and colour), high yield, resistance to disease and pest-tolerance, adaptation to the environment, maturity (early, medium and late) and market demand were reported as seed selection criteria by both MHHs and FHHs.

Management of Potato Fields

The planting of potatoes was usually done by women, boys and girls, while men made rows, by oxen plough, where the tubers are to be planted. Weeding was carried out by women, girls and boys. The time of first weeding was between two weeks and a month after planting, depending on rainfall conditions. Even though all the family members were involved in the activity, the contribution of women was much higher than the contribution of the rest of the household members, because much of women's other work was based in the home, and potato was often cultivated close to homesteads. The contribution of girls and boys in this activity was next to that of women, while that of men was minimal.

Damage by domestic and wild animals, particularly porcupines, was a critical problem that limited planting potatoes off homesteads and thus planting in larger areas. . Potato production also suffered from trampling by domestic animals unless the area was fenced properly.

All members of the household were involved in fencing activities: men and boys played key roles in guarding the potato farm at night, and during the daytime guarding was usually handled by women, girls and boys, in decreasing order of engagement.

Women and men played different roles in disease identification, depending on the district. In Cheliya the lead role was taken by women while in Jimma Arjo by men. In general, this activity was seen as a responsibility of both men and women, while disease control was responsibility of men. Disease control often involved an agricultural extension agent, who was usually contacted by men. This might be because it is not easy for women to travel the relatively long distances needed to contact extension agents.

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

Harvesting and Storage

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

One of the crucial problems challenging smallholder potato-producing farmers was lack of knowledge about methods of reserving seeds for the forthcoming cropping season. Potato tuber seeds are living organisms, with a high moisture content compared with seeds of cereals; so potato seeds require proper storage systems, to keep storage losses to a minimum. Storage was reported to be handled by men, women, boys and girls alike. Time for storage is immediately after harvest and continues till market time for seed. The period for which the seed potato stayed in storage lapsed from September to March or even much longer, based on planting time.

Marketing

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

Soil Fertility Management

Soil is a fundamental resource for crop growth; the fertility status of soil largely determines the growth and yield level of crops. Soil fertility is among the many constraints affecting 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. Soil fertility management takes place the whole year—after harvest and before planting, as well as during the growing season. All family members participate in soil fertility management, although men play the leading role in this activity. In all the study districts, none of the potato farmers used inorganic fertilizer, except when they received a supply of improved seeds and fertilizer from the Potato Seed Technology Transfer Project of ASARECA/CIP.

Soil fertility replenishment through the application of manure (commonly collected from excreta of cattle, sheep, goats, donkeys and horses) and household garbage was handled by women, girls, boys and men in decreasing order of engagement. Soil fertility enhancement by use of crop residue was not common in the Cheliya highlands.

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

Gender-Differentiated Roles in Adoption of Technology

Adoption Factors

Potato technology adoption was positively correlated to family size (large families having a higher technology adoption rate than smaller families), to level of education, to land-holding and wealth (relatively wealthy households and/or those with larger land-holdings were more likely to adopt the technologies). Suitability of agro-ecologies was also an important factor determining technology adoption level.

Gender-related preferences of certain potato qualities, such as early maturity and big tuber size—qualities preferred by women for marketing and processing—facilitated the adoption of potato technologies across the surveyed districts. Since potato is considered a homestead crop, and its cultivation is often managed by women, women contributed positively to the adoption of technologies for better management of this crop.

The time of potato harvest coincides with a general period of cash shortage for household expenditure, which further encouraged women's involvement in potato technology adoption. Nonetheless, women claimed that their 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, or on the division of the produce for marketing and domestic use. In addition, women did not benefit from the official and non-official training offered to facilitate clean potato seed production and distribution. This was because it was mostly men that participated in training of any type whether relevant or not to their identified role in potato production.

Impacts of Potato Technology Adoption

The majority of respondents (89.6 per cent) said they believed there had been changes in potato production—an increase in area of production, an improvement in quality, and enhanced market demand—since the introduction of potato technologies through participatory technology promotion. Varieties improved by technology input were preferred

over non-improved ones for various reasons: for better taste (37.2 per cent of the respondents), for bigger tuber size (26.7 per cent of the respondents), for both better taste and bigger tuber size (33.3 per cent of the respondents), and for preferred marketability (96.1 per cent of the respondents).

Traditional gender-based potato activities and crop production changed totally after the adoption of new technologies. As the potato crop production became commercialised, men took over potato seed production activities. If the potato seed technologies had been adapted for small-scale production, women would have benefited by selling a portion of the product to cover household expenditures, and the men would also have had access to such produce. However, since the adoption of potato technologies favoured specialised seed production for large-scale farms, men were usually the ones who benefited from income generated through sales of the produce.

Conclusions and Recommendations

Most household members participated as a group in farm activities. To understand and appreciate the contributions of each gender group in farm activities, it was therefore important to the community that gender roles be identified clearly in such group activities. Technology transfer was often hindered when intra-household dynamics were not taken into account. This study revealed that women often provided the extra labour required for successful technology uptake, particularly in the case of potato production, and hence facilitated technology transfer.

Most key informants, both male and female, and group discussion participants pointed out that the adoption of technologies was usually determined by both men and women (husband and wife). It is important to note that introduction of some technologies – including those aimed at potato improvement – might increase the work burden of women. It is, therefore, essential that women be involved throughout the process of adoption and the development of technologies, especially since they are in a better position to identify the essential qualities of the produce. It is only when the gender roles of household members are identified,

and an enabling environment created, that sustainable development can be realised.

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

Gender division of labour has dynamic features that change with the production system and over time. It also 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 the women's domain (sweet potato, potato, onion, garlic and fenugreek). The experiences 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.

Unlike women, men are involved in numerous social and political affairs. They decide on issues affecting the development of their households and communities, without any input from women. Assets belong primarily to men, since they, in most instances, are heads of their respective families. Men sell the produce, including livestock, and keep the proceeds for their own use, providing only little for the rest of the family. This evidences presence of gender discrimination or domination. But because of cultural stereotypes, women have accepted this domination by men; unless women are empowered and men appreciate the empowerment, there will not be 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 the major role in kraal rotation, while women, girls and boys participate as key actors in manure application.

Generally, this study revealed that there was no gender equity or equality between men and women in rural Ethiopia, as elsewhere in other developing countries, due to the impact of culture, reflected in traditionally - accepted social norms that place a heavy work load on women without commensurate benefit. Women usually had little or no access to resources or control over them.

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

2 Control refers to domination, ownership and decision-making..

3 *Enset* is a fruit similar to banana or plantain; *tef* (or *teff*) is a food grain used to make the fermented pancake *injera*.

4 *Waaqeffannaa* is a very ancient Oromo religion based on a belief in one God called *Waaqa*.

5 A quintal is equivalent to 100 kilogrammes.

3

Evaluation of the Gender and Social Perspectives in Choice and Profitability of Soil Fertility Management Technologies for Smallholder Maize Production in Kenya

J.M. Macharia, S.K. Kimani, Lydia N. Kimenye, and Joshua 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 Kenya's 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. In addition, there has been a failure by research and extension services to consider variability in the needs, constraints and interests of men, women and children in the development and extension of soil fertility management (SFM) technologies. This has caused slow adoption rates and hence low profitability of such technologies. There has been, therefore, a steady increase in the number of risk-averse, small-scale farmers, especially women, who cannot afford costly external inputs, such as inorganic fertilizers. The overall effect has been a profound decline in soil fertility and a shortfall in household and national food production.

Availability and productivity of productive resources, such as land, labour and capital have similarly decreased over the same period due to population increase, soil fertility decline and worsening socio-economic circumstances. This scenario has posed enormous challenges to resource-poor smallholders and as a result agricultural production has declined and rural poverty has assumed astounding dimensions. The challenges are also to biophysical and socio-economic researchers, extension agents and policy makers. Technologies from research on integrated nutrient management (INM) are many and varied. However, farmers' socio-economic characteristics – including gender, farmers' preferences for certain technology attributes and resource constraints – have not always been considered by researchers and stakeholders in the development and packaging of agricultural recommendations. Presently, the introduction of gender as a significant variable in the analysis of the utility of technologies and their viability is a relatively new concept that is not fully understood by farmers, extension agents, and other stakeholders.

Kenya's smallholders are highly heterogeneous. They occupy much of the available agricultural land and are the largest employers of rural labour. They own farms of various sizes and capital endowments are of different ages and educational levels and belong to different social and gender domains. Yet, all face similar production constraints, risks and uncertainties. These include high input costs and low producer prices, poor road and market infrastructure, lack of credit, and technological constraints. The study detailed here therefore sought to address this information gap by examining gender differentiation in analyses of technology choice; and gender-related profitability differentiation in using the existing SFM strategies for small-scale maize-based production systems in central Kenya. Given the resource constraints facing rural smallholders, there is a need to guide farmers in judicious decision-making and economic efficiency in productive resource allocation. Clearly only those technologies that give profitable outcomes should be adopted.

This 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*. The Kenya Agricultural Research Institute (KARI) was the recipient and administrator of a research grant from Rockefeller, while the main collaborators were the Tropical Soil Fertility and Biology Institute of the International Centre for Tropical Agriculture (TSBF-CIAT), the Kenyan Ministry of Agriculture (MoA), and the University of Nairobi (UON). In this project, participatory learning and action research (PLAR) approach was used to delineate farmers in the study districts into different farm typologies depending on their soil fertility management capabilities and wealth endowment. The project then set up on-farm demonstrations where maize-bean intercrop was the study crop. Different soil fertility treatment (farm manures, inorganic fertilizers, and legume cover crops) were applied at planting time. Management and evaluation of the experimental plots were jointly undertaken by farmers, extension agents and researchers. The crops were later harvested, weighed, and costs and benefits from different treatment analyzed. Farmers' perception and likelihood for adopting different technologies depending on their soil fertility and socio-economic classification were later analysed.

General background

Gender in Agricultural Production

Intensive land-use systems practised in many parts of Sub-Saharan Africa (SSA) without adequate nutrient replenishment have led to massive depletion of plant nutrients, decline in per capita food production, and thus to malnutrition and food insecurity (Lynam and Hassan 1998). The most affected social groups are women and children due to their limited ability to cope with the stressful effects of hunger, poverty and malnutrition. The livelihood needs of men and women in any given social system are not always the same, because of their different roles, responsibilities and resource endowments (Pasteur 2002). The impacts of different livelihood strategies also vary 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 today is how to feed their growing populations from a fixed natural resource base (NRB). This means, therefore, that land, water, and tree resources must become increasingly productive in environmentally resilient way. However, there are certain factors that militate against such goals, including depleted soils, poor roads, poor marketing infrastructures, low adoption and profitability of agricultural technologies across different gender and social classes, lack of access to credit, and lack of dynamism in socio-economic systems and a variety of other standard development challenges that rural Africa is confronted with.

Gender is not a new concept in African agriculture. However, it has only recently been recognised as an important concern in agricultural research (KARI 1998). Gender embraces all socially-given attributes, roles, activities and responsibilities connected to a person, either male or female, in a given society. Important gender categories include men and women, boys and girls, young and elderly, male-headed and female-headed households. In any social system gender has great potential for having a significant impact on farm incomes and food security. Different roles and responsibilities are placed on the different genders by different social systems. These roles and responsibilities are critical determinants of access to and control over productive resources, such as land, cash crops, and livestock products. The social systems also determine entitlement to resources and power among men, women, and children. This, therefore, implies that food security would improve if different gender roles were properly integrated into agricultural research and development (R&D) programmes.

Soil Nutrient Depletion in Sub-Saharan Africa

Traditionally, increase in agricultural output in SSA has been achieved through the expansion of cultivated area. Little of the best arable lands left today must be divided among the farming populations which continue to expand. Such an approach has led to widespread

degradation of land and NRB in many parts of the continent (Lynam and Blackie 1994). According to Flintan (2003), in the past, environmental and soil fertility decline were addressed through shifting cultivation, mainly by men-dominated initiatives. In some instances women played little or no role and were therefore marginalised (Flintan 2003) while in other instances the whole of the agricultural economy depended on female labour. At the same time, due to an increase in population pressure, some traditional practices of NRM became obsolete and untenable. This has culminated in environmental degradation, nutrient depletion, hunger, and widespread poverty. Alternative profitable and sustainable ways must, therefore, be found quickly to restore lost soil fertility and NRB productivity.

The utilisation and viability of smallholder SFM technologies are influenced by political, social, economic and institutional constraints. Any decision to adopt SFM technology would be based not only on profitability but also on potential tangible social and cultural benefits. According to Doss and Morris (2001), farmers will adopt technologies if they do not seriously disrupt existing farming systems, jeopardise their subsistence, or introduce additional strains on already constrained and limited resources. Profitability and returns to land, and availability of farm labour and working capital are some of the criteria used in the decision-making process. In this and other studies, however, gender aspects are not considered and the resulting constraints on the adoption of technologies across gender are ignored. This study therefore sought to analyse the role played by attributes of technologies, characteristics of farmers, and gender differences as it relates to choice and profitability of technologies.

The 1996 World Food Summit forecast that food insecurity would become a global concern in the 21st century (FAO 1996), especially 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 on the adoption of many SFM technologies.

There is a need, therefore, to analyse interactions between different technology attributes and farmers' circumstances, and to examine how this influences choices of SFM technologies by small-scale farmers. This is because the smallholder farmers have continued to experience declining per capita food production due to nutrient mining without adequate replenishment (Buresh, Smithson, and Hellums 1996). As the population increases, the problem is aggravated further by the cultivation of vulnerable, low-potential areas (Pieri 1989; Sanders, Shapiro, and Ramaswamy 1996). The African woman, who produces most of the household food, therefore faces conditions of difficulty and stress, for which few real answers exist. While there are many technically sound recommendations for addressing problems facing smallholders, most have ignored the effects of gender on adoption decisions.

Integrated Soil Fertility Management Paradigm

The cornerstone of the integrated soil fertility management (ISFM) approach is recognition of the importance of soil organic matter (SOM) in the preservation of soil fertility and soil physical properties (Kauffman 1999). This is because water availability, plant nutrients and soil degradation are dependent on the SOM content of soil (Kimani *et al.* 1999). One of the goals of ISFM should therefore be to develop land use and land management practices aimed at increasing and maintaining SOM content.

A range of soil amendments in combination with inorganic fertilisers has been tested in Kenya (Kimani *et al.* 1998; Kimani *et al.* 2000). These amendments include the use of crop residues, animal manure, compost, and green manure cover crops. While the average maize production used to be 1,000 kg per hectare, up to 6,000 kg per hectare has been realised under various ISFM technologies (Breman 1997). This evidence indicates the vital role soil amendments can play in increasing food security, and hence farm incomes and rural welfare. However, viability and profitability of SFM technologies have profound implications into the farming systems. The extent of extra costs that could be incurred or extra benefits achieved by farmers from adoption of soil fertility

technologies determines the attractiveness or unattractiveness of such technologies to male and female farmers. Therefore, socio-economic viability of different technologies has critical implications on technology preferences of the male and the female farmers.

According to Breman (1997), ISFM approaches involved considerable investment, including labour for organic inputs, and money for inorganic fertilisers; green manure cover crops competed with other crops for available land and it took a considerable time for their benefits to be realised fully. Women are constrained by labour drudgery, and limited access to and control over land and capital. Most household chores are labour-intensive and performed by women, so women would reject potentially profitable technologies unless they were obviously labour-saving. There is, therefore, a need for analysis of various technology attributes and farmers' circumstances, if the adoption and resulting profitability of ISFM technologies is to be enhanced.

Encouraging Low-external input Soil Fertility Management

Extensive use of organic fertilizers to overcome declining of soil fertility on smallholder farms in Kenya is consistent with the reality of low utilisation of inorganic fertilisers (Gachengo *et al.* 1999). According to Jama *et al.* (1999), improved fallows are economical and have high returns to labour. Biomass transfer and improved fallow systems can therefore be as effective in supplying nitrogen, phosphorous, and potassium to maize as commercial fertilisers are. Jama *et al.* (1999) 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 characterised by high population densities, that 40 per cent of households are female-headed, and that land parcels are less than 0.8 hectares. However, these technologies need to be analysed for gender sensitivity and efforts made to make them more gender responsive.

The technical and financial performance of biomass transfer and improved fallow systems varies across spatial locations and across the gender divide. Due to poverty and pressure to fulfil daily household

chores, women tend to prioritise short-term practical strategies rather than those demanded by some SFM technologies (Flintan 2003). This often conflicts directly with conservation and environmental objectives that are more long-term in nature. There is a need, therefore, to evaluate the feasibility of different SFM technologies and their acceptability in the different spatial, gender and socio-economic conditions of smallholder farmers in central Kenya.

Gender, Choice and Profitability of Soil Fertility Management Technologies

Kenya has had a long history of successful agricultural research and the subsequent release of new crop varieties and innovative technologies. Despite this, the country continues to suffer from 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 per cent or less of their potential.

Since farmers' needs and objectives are diverse and always changing, diversities need to be considered in technology development processes to a greater extent than has hitherto been the case. For example, much work has been done on manure use, management and potential by small-scale farmers in central Kenya (Lekasi *et al.* 1998; Lekasi 2000), but only limited studies have been carried out on the costs, benefits, and other effects of gender diversity on the utility and viability of these technologies. Other socio-economic factors, such as land size, input requirements, off-farm income opportunities, skills requirements, labour availability, and producer prices should not be ignored.

Women are key providers of labour in agriculture but are constrained by a number of socio-economic factors. They contribute about 80 per cent of labour to food crop production, and 50 per cent to cash crop production; but they receive only seven per cent of extension information (World Bank 1994). Women also play lesser role in decision-making institutions, and in networks of power and authority – all of which are male-dominated. In general, women are less frequently consulted in technology development and transfer than

men are. Gender is therefore a very important variable in the research and development contexts.

Gender relations are not universal and are dynamic over time and space. In addition, households are not uniform decision-making units but represent the complex interactions of individual interests and abilities, and the priorities of different male and female members. Women and men have different life experiences, different knowledge, perspectives, and priorities. Their access to and control over resources and benefits are not equal. Men cannot necessarily represent the interests of women, nor vice versa; and neither sex alone can adequately represent their community. Research managers, therefore, need to address gender issues when setting research priorities and take into consideration the diversity of clients' needs – which will, in turn, serve as pillars of success in increasing agricultural productivity and production in Kenya.

In the last two decades, women have been recognised as the key actors in food- production chains. They often contribute more to agriculture and household food production than men do. It has also been acknowledged that women contribute more working hours to agriculture; yet they are structurally disadvantaged regarding access to and control over productive resources and benefits. In Kenya, it is estimated that women provided about 75 per cent of the total agricultural workforce (World Bank 1994). Besides this fact, women are increasingly assuming roles of managers and heads of households, due to the migration of men to urban centres in search of non-farm incomes. Currently, women manage and head about 40 per cent of all smallholder farms (World Bank 1990).

Despite their enormous contribution to agricultural and food production, very little is understood of women's decisions whether or not to use available technologies (Kimenye 1997). Women tend to be involved in subsistence production rather than commercial farming, and they make limited use of improved technologies. Consequently, their productivity tends to be below that of their male counterparts. In Kenya, for example, women's productivity is 20 per cent below that

of men (Saito 1994). In addition, different gender and social categories (men, women, and youth) have different needs and priorities in accordance with their different roles and statuses. 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 SFM technologies in rural Kenya implies that soils that have been cultivated continuously over a long period of time now suffer from chronic nutrient imbalances (Sanchez *et al.* 1996). Even naturally fertile volcanic soils, in the long run, will require farmers to adopt a SFM regime in order to correct soil nutrient imbalances. Although technical and biophysical aspects of soil-fertility decline are well known and have been documented widely, little is understood about the socio-economic, cultural, and environmental factors influencing farmers' choices of SFM technologies. These technologies are, therefore, formulated amidst information gaps regarding farmers' preferences, and the accessibility and profitability to the farmers of such technologies.

The problem of low adoption has been exacerbated by the liberalisation of the country's economy. Government control on input and produce prices has been removed with an assumption that market forces will determine input-output prices. However, the failure of such an assumption to materialize poses grave challenges to food security, agriculture and NRM. Despite three decades of substantial technology development, workable solutions to the problems of low farm production and profitably remain elusive. A recognition of gender as a significant socio-economic variable in technology development and transfer is one of the strategies that could improve smallholder food production. There is a need, therefore, to mainstream gender analysis in NRM research, to highlight gender roles and inequalities in access to and control over resources, and how this affects the adoption and profitability of different SFM technologies.

Objective of the study and study area

It is expected that the findings from the present research will lead to the streamlining of development policies and programmes to take full account of the influence of gender inequalities on agriculture, to work to reverse nutrient depletion more effectively, to increase food security, reduce poverty and improve rural livelihoods. The aim of the study was thus in line with Kenya's development policies as outlined in the government's Poverty Reduction Strategy Paper and other government policies (Government of Kenya 1994, 1995, 1996, 2001).

The major objective of the study was to determine the main attributes of small-scale SFM technologies, and to evaluate farmers' characteristics, including social and gender diversities, and examine how these have influenced the choice and profitability of SFM technologies for low-income farmers in the maize-based production systems of central Kenya. The specific objectives of the study included (i) identifying and evaluating the socio-economic characteristics, including differences in gender roles, that influence the choice of SFM technologies in small-scale maize-based production systems in central Kenya; (ii) analysing the agronomic and economic attributes of different low external SFM technologies appropriate to particular smallholder socio-economic and biophysical circumstances; and (iii) determining the influence of gender on the 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 1,448 square kilometres, and an absolute poverty level of 25 per cent. The district is heavily populated, with a population density of 562 persons per square kilometre, and an average farm size of 0.58 hectares. The district has four main agro-ecological zones (AEZs): (i) the upper highlands (UH), (ii) lower highlands (LH), (iii) upper midlands (UM), and (iv) lower midlands (LM). Major farming enterprises include maize and beans, potatoes and pyrethrum, horticulture and fruits, tea and coffee, dairy and poultry.

Maragwa district covers an area of approximately 1,065 square kilometres, with population density of 488 persons per square kilometre, and an average farm size of 0.93 hectares (Government of Kenya 1996). In 1997, the absolute poverty level was 37 per cent. The district has four main AEZs: (i) LH1, (ii) UM1, (iii) UM2, and (iv) UM3, and the major enterprises include tea, maize, beans, dairy, horticulture, and coffee.

Kirinyaga has an area of 1,437 square kilometres, a population density of 318 people per square kilometre, and an average farm size of 1.25 hectares. Absolute poverty in the district is about 35.7 per cent. The most important AEZs are LH1, UM, and LM3. The main enterprises include maize, beans, tomatoes, French beans and bananas.

The targeted study districts are representative in many respects of the entire central Highlands of Kenya. The population densities are high, land fragmentation is widespread, women and children provide the greatest proportion of farm labour, and soils are poor and cultivated intensively, resulting in annual production far below full potential. Key findings of the study can therefore be applicable to smallholder farming systems in other districts with similar circumstances.

Methodology

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 were collected from a random sample of 102 households and analysed on various attributes of different SFM technologies, as well as on farmers' socio-economic characteristics, including gender domains and wealth-endowment status. The aim was to find out how these factors affect the choice and profitability of various SFM technologies to the male and female gender groups.

Conceptual Framework

There are various factors that may either enhance or inhibit farmers' adoption of SFM technologies (Figure 3.1). These include personal, physical, institutional, socio-economic, and cultural factors. Improvement in SFM would result in increased crop yields, larger farm incomes and improved welfare of farmers; but naturally there are side-effects, such as increased demands on family (especially child and female) labour. Such anticipated benefits can only be achieved fully, however, if the various SFM options available to farmers are explored adequately 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 suit their own needs under given socio-economic circumstances.

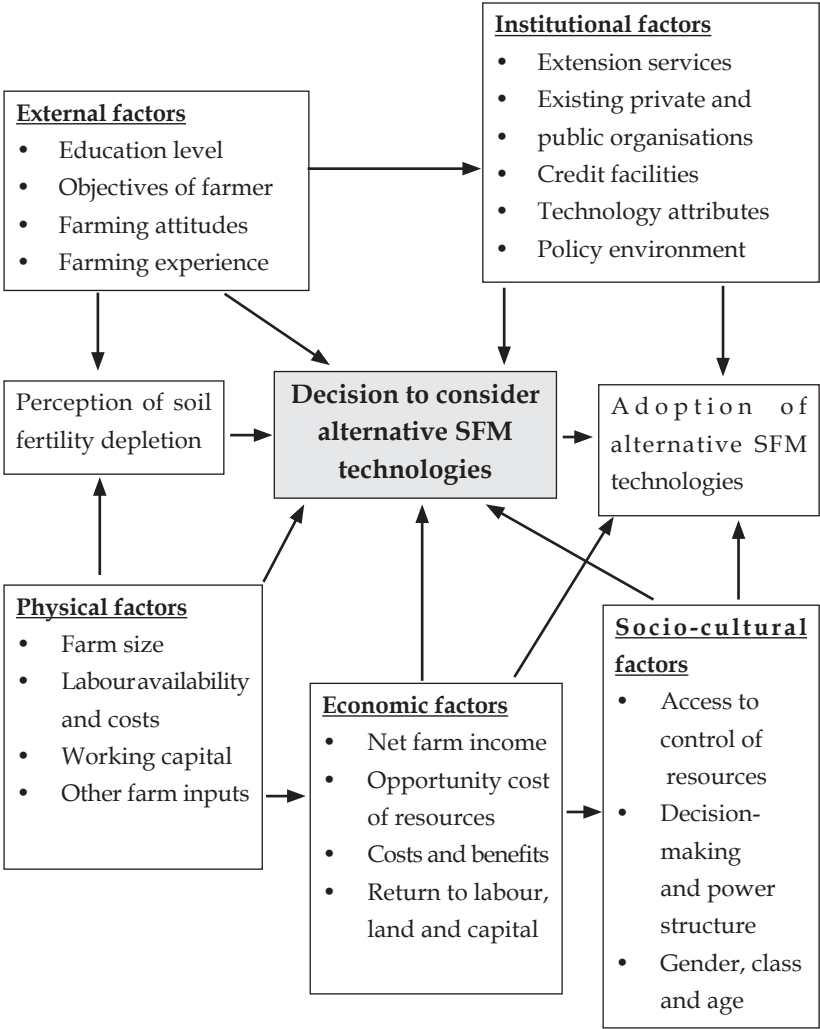


Figure 3.1. Conceptual model of farmer's choice decisions

Methods of Data Analysis

Gender Analysis Framework (GAF)

Gender analysis (GA) is an organised approach to understanding how men and women relate to each other in terms of roles and responsibilities, and in terms of access to and control of resources and benefits in a given community (Pasteur 2002). It also includes what men and women, boys and girls do; their locations and patterns of mobility; and 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 process.

The gender analysis framework (GAF) used in the study included an assessment of livelihoods assets; access to and control of resources; and power and decision-making processes. The practical and strategic needs of men and women, and their priorities and perspectives were also explored. GA tools, such as social and resource mapping, daily and seasonal calendars, economic well-being ranking and mobility mapping were used. This was used to analyse opinions of different gender groups with regard to the costs and benefits of various SFM technologies. It was therefore important to involve the target groups in the planning, monitoring and evaluation of the research activities, in order to analyse impacts of the different technologies on women, men, boys and girls.

The GAF was used to explain observed differences in behaviour between genders in terms of unseen underlying attitudes, beliefs and social contexts. This was done through separate meetings with each sex – at times and in 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 were collected by use of a structured questionnaire from randomly selected farmers in each study site. Gross margins (GM) per hectare, per man-hour of labour, and per shilling of working capital were computed for different genders in different farm types.

Findings and discussion

Social and Gender Analysis

The agricultural sector is the backbone of Kenya's economy and its status and stability determines the country's overall economic growth. It follows, therefore, that poverty eradication, food security and improved livelihoods depend on agricultural production and productivity. Gender equality or disparity has a major influence on the process of economic growth, and this calls for better understanding of who holds or plays key roles in the agricultural sector. In most traditional Kenyan farming set-ups, a woman spends much of her time on a farm that she may or may not own or have control over, and more often than not she has no say in the accruing benefits or in the development activities of that land. The present research shows how gender and other social factors can influence the choice of SFM technologies in certain maize-based production systems.

Categories of Households

Interviews were conducted with 102 female and male-headed households in Kiambu, Maragwa, and Kirinyaga Districts. In Kiambu 40 per cent of those interviewed were females, in Kirinyaga 49 per cent were females, and in Maragwa 69 per cent were females. Overall, females comprised 53 per cent of those interviewed, though the interviewees were not necessarily household heads. This gives a ratio for female to male of nearly 1:1.

It was established that the household head was the main decision-maker; he or she decides what to grow, what SFM technology to adopt, when to get a loan, or the type of development to be initiated in the farm. Male-headed households differed in development initiatives and innovations from female-headed ones. Female-headed households represented only 17 per cent in Kiambu and 38 per cent in Maragwa. Overall, of those interviewed, female-headed households represented 24 per cent. Results indicated that there is need to know whether men or women were dominant in decision-making processes as this was likely to determine the adoption rate of SFM technologies.

Farmers' Education and Age

It was established that the education level of household heads was an important factor influencing what development projects people initiated, which new farming technologies they adopted, and what changes in farming enterprises they made. In Kiambu, 97 per cent of household heads had at least a basic primary education (and of these 3 per cent had some tertiary education), while the remaining 3 per cent had no basic primary education. This was an indication of a high literacy level in the district. In Kirinyaga, about 91 per cent had at least basic primary education, of whom 6 per cent had tertiary education. In Maragwa, however, only 69 per cent had attained at least basic primary education, with 9 per cent having attended tertiary education. A general overview across the districts showed that 86 per cent had attained at least basic primary education, with 6 per cent of these having some tertiary education.

The age of a farmer was an important determinant for development, information dissemination, and adoption of new technologies. Young and energetic farmers were more likely to adopt new SFM technologies and tended to engage in enterprises which were market-oriented and more profitable; they were more dynamic, interactive, knowledgeable, and possessed better skills. In Kiambu, many (26 per cent) of the farmers were between 51 and 60 years of age; in Kirinyaga 23 per cent were aged between 46 and 50, and in Maragwa a still higher proportion (34 per cent) were aged between 51 and 60. Overall, 26 per cent of the farmers were aged between 51 and 60 years. Old farmers were more risk-averse and were hesitant to adopt new SFM technologies, despite proven higher productivity and profitability of SFM technologies.

Occupation of the Farmer

In Kiambu, 11 per cent of the farmers were self-employed and/or also engaged in other non-farm informal employment. The remaining 89 per cent had no other formal income-generating employment. In Maragwa, 81 per cent had no other formal or informal employment, 13 per cent were self-employed, and 6 per cent had formal employment other than

agriculture. In Kirinyaga, 77 per cent had no other employment except farming, 9 per cent were retired civil servants, 9 per cent working civil servants, and 3 per cent were self-employed. In general, 85 per cent were farmers with no other employment, 5 per cent were civil servants and 10 per cent were self-employed. Full-time farmers were interested in increasing and sustaining their farms' production and productivity and were more likely to adopt new SFM technologies.

Type of Household

There were six different types of households in the study area. The largest category, 72.5 per cent, was male-headed and married, while female-headed households comprised only 10.8 per cent of the total.

In Kiambu, although 89 per cent of household heads were farmers, only 26 per cent of households were food self-sufficient. Of the rest, 34 per cent produced up to 75 per cent of what they need and 10 per cent produced half of what they need. The remaining 20 per cent produced only 25 per cent of what they need, and 9 per cent depended entirely on purchased food.

In Kirinyaga, 40 per cent of the farmers had sufficient food and hence had no need to purchase; 40 per cent purchased 25 per cent of what they need, 17 per cent purchased as much as they produced, and 3 per cent purchased 75 per cent of household food. None of the farmers depended entirely on purchased food.

In the other two districts, none of the households had enough food; but 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.

Farmers were thus dependent on purchased food to supplement own produce. This pointed to a need for smallholders in the study area to adopt higher-yielding SFM technology to ensure that all household food requirements were met from on-farm production.

Water Sources

The source of domestic water was a very important aspect of livelihoods in all households. In Kiambu, 74 per cent of households had access to

tap water, while, of the rest, 6 per cent had access to river water, and 3 per cent used borehole and river water. In Kirinyaga, only 6 per cent had access to tap or borehole water, while 89 per cent depended on water from rivers and wells. In Maragwa, the great majority (94 per cent) collected their domestic and livestock water from rivers and wells, but had no access to safe and clean drinking water; only 3 per cent could access borehole water. Overall, 89 per cent of the farmers interviewed lacked access to clean and safe domestic water.

Different means of collecting water were used by the farmers, depending on the distance to the water source and the time required to get there. On average, at least six trips—three each for livestock and domestic use—were required for daily water requirements. Water fetchers in most of the households in Kirinyaga walk up to four kilometres to the water source, mainly unsafe river water. It could take up to two hours to walk to the water source and back, and some households had to make as many as ten trips to have adequate water for their daily needs. On average, it took 46 minutes per trip to collect water for domestic use from a distance of a kilometre and three trips per day to collect water for household use.

In Kiambu, it was mainly boys, and sometimes also girls, who were responsible for attending to domestic water needs, and women also participated in such tasks. Depending on the distance to the water source and availability of resources, farmers use different means to collect their domestic and livestock water. In Kiambu, where there is water available within the compounds, many farmers simply hand-ferry it to their houses and livestock sheds, but 39 per cent still have to expend a lot of time and energy to collect this water.

Water availability, the time used for its collection, its quality, and the sexes involved in its collection were critical in determining the amount of family labour that would be available for other work on farms. Farmers, especially women farmers, were hesitant to adopt labour-intensive SFM technologies despite the potential for higher productivity, because of their commitment to essential and vital domestic chores.

Household Income Sources and Expenditure

In Kiambu, the main on-farm income-earning product was maize (30 per cent), followed by beans (15 per cent) and dairy (13 per cent). There was, however, a gradual shift from maize cultivation to dairy farming and horticultural crop production (high market-value crops, such as tomatoes).

A nutrient-monitoring survey carried out within the same locality showed that the land area under maize cultivation was decreasing. Horticultural crop production has made less land available for grazing, hence the prevalence of “zero-grazing” of dairy cows (fodder from outside the farm was brought to the cows instead of letting the cows go out to graze) and the cultivation of high value crops, such as tea and coffee. In Kirinyaga, the leading on-farm income earner was maize, at 26 per cent of total on-farm income, followed by beans (21 per cent), then bananas (14 per cent) and tomatoes (12 per cent). In Maragwa, maize was the main on-farm income earner (25 per cent) for the households, and also contributed a quarter (25 per cent) of the total on-farm income. The on-farm income appeared to be distributed among five main on-farm income contributors: (i) maize (25 per cent), (ii) beans (22 per cent), (iii) milk (16 per cent), (iv) bananas (12 per cent), and (v) coffee (12 per cent). Overall, maize was the leading on-farm income earner (30 per cent), followed by beans (15 per cent) and then milk (13 per cent). This showed the need for adopting improved SFM technologies which could enhance production of maize as the main income on-farm earner. The main source of off-farm income (19 per cent) was casual labour.

In Kiambu, the main on-farm income earners were wives, who earned as much as 61 per cent of the on-farm income. Husbands earned about half (31 per cent) of what their wives earned. Similarly, in Kirinyaga, wives were the main earners of on-farm income (60 per cent), while the husbands earned 39 per cent. In Maragwa, however, husbands and wives jointly earned 41 per cent, while wives alone earned 24 per cent 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 total incomes of the families interviewed while 14 per cent of these households depended solely on off-farm income for the day-to-day upkeep of their households. Main off-farm activities were casual labour and self-employment, with casual labour dominating. The husbands were the main off-farm income earners in both Kiambu and Maragwa; more so in Kiambu than in Maragwa, followed by children, while the contribution of wives was minimal.

Gender Labour Profile

In Kiambu, women on average spent more time (9 hours per day) on farm work than men did (6 hours per day). In Kirinyaga, men spent more time (average 6 hours per day) on land preparation than women did (2 hours per day), while women spent more time (7 hours per day) on planting than men did (4 hours per day).

In Maragwa, men and women spent more or less equal time on land preparation and on planting; but women spent more time on weeding (5.4 hours per day) than men did (4 hours per day). Men seldom contributed to harvesting, while women spent an average of 5 hours per day on harvesting during the harvesting seasons. In general, men spent more hours (5.1 hours per day) than women did (3.5 hours a day) in land preparation during the season. In maize production activities (planting, weeding, harvesting and shelling), it was primarily females who were involved. In Kirinyaga, males dominated land preparation (94 per cent) and attending field days and demonstrations, while females did 86 per cent of the maize planting, 71 per cent of the weeding and 83 per cent of the shelling(). However, female farmers expressed a strong desire to share all farming activities equally between male and female members of the household.

Gross Margin Analysis

Gross margins (GM) per hectare, man-hours of labour, and working capital (in shillings) were computed for maize-bean enterprises to determine profitability across different sexes and SFM classes or farm typologies. Division of the GM of the various enterprises according

to their labour requirements and total variable costs per hectare provided figures for GM per man-hour and GM per shilling of working capital. These GMs were computed from primary data captured in a structured questionnaire. Farmers, regardless of their socio-economic circumstances, need to invest their scarce farm resources in the most profitable SFM technologies. From farm surveys undertaken, the amount of land, labour, and working capital available for maize enterprises in three SFM-based typologies were determined. In addition, nutrient levels, land, labour and availability of working capital in different farm typologies in all the study districts were compared.

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

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 safeguard domestic food self-sufficiency, rather than embark on production for marketing. Technology change is inevitable in the adoption of superior SFM technologies to boost household food production and farm incomes. The adoption of new SFM technologies would mean extra benefits and extra costs. Both female and male farmers were therefore concerned with returns per unit of land, of labour and of working capital invested in such technologies.

It was predominantly the wives who decided on the maize varieties used. This is because the socio-economic factors revolving around choices of improved maize varieties were critical. However, the adoption of improved SFM technologies alone would not guarantee household food security. These technologies needed to be combined with the adoption of high-yielding, early-maturing and disease-resistant maize varieties.

General Observations and Findings

The importance of maize as the main food staple in Kenya cannot be overemphasised. Over 80 per cent of all maize growers are smallholder farmers who are constrained by scarcity of production resources (Government of Kenya 2002). This research aimed at understanding how declining soil fertility, labour and working capital availability and productivity have affected the food output, incomes and livelihoods of female and male smallholders in the central Kenya highlands. The specific objectives of the study were to determine the major attributes of small-scale SFM technologies; to evaluate farmers' characteristics, including socio-economic, gender and roles diversities; and to establish how these differences influenced the choice and profitability of SFM technologies among low-income farmers in the maize-based production systems of central Kenya.

Escalating food insecurity, malnutrition and poverty have been major problems in the smallholder farming systems. About 56 per cent of the Kenyan population live below the poverty line (less than USD 1 per day), 80 per cent of the poor live in rural areas, with the majority being women. One major cause of this problem is that the population has increased to such an extent that the available land is no longer adequate. This has led to land subdivision and intensive cultivation without adequate soil fertility management. Escalating prices of inorganic fertilisers have exacerbated the situation, especially after the collapse of farm support programmes in the 1990s. Resource-poor smallholders have therefore resorted to low-external input SFM technologies – the so-called “organic input” paradigm. However, the adoption and profitability of such technologies have been constrained by technology developers' lack of knowledge regarding the gender, social and economic diversities of farmers. The consequences have been further depletion of plant nutrients, land degradation and a decline in per capita food production in smallholder agro-ecosystems.

Conclusions

The following conclusions were drawn from the key findings of the study.

1. Evaluation of Smallholders' Characteristics

- a) Participatory learning and action research (PLAR) could be successfully applied to delineate female and male smallholders' farm typologies along different SFM gradients and resource-endowment status. This approach could enhance the adoption of appropriate SFM technologies across the gender divide, leading to increased productivity and hence greater profitability of smallholders' agro-ecosystems.
- b) Once the 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); demonstrating and packaging SFM strategies that were appropriate to specific farmers' cultural and socio-economic circumstances in each study site. The adoption of such technologies could lead to efficient use of scarce farm resources by different genders – resulting in enhanced food security, greater income, and improved smallholders' welfare.

2. Evaluation of SFM Technologies

- a) Before an economic analysis of viable SFM technologies could be done, it was necessary that a relative agronomic evaluation of biophysical data from different treatments be undertaken. This way, the manure plus inorganic fertiliser levels (kg of nitrogen per hectare) that gave the highest yields per hectare were determined. From this analysis it was clear that, on application of increasing levels of any appropriate input, there was a corresponding incremental rise in crop yields.

- b) Decisions based on biophysical data alone cannot be sufficiently conclusive until the costs of added elements are considered, and the accruing benefits analysed (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.
- c) The adoption of SFM technologies depended on the benefits perceived by farmers being greater than the extra costs involved in using 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. Evidence from our literature search indicated the overwhelming potential of low-external input SFM technologies in reducing smallholders' food poverty, and improving farm incomes and livelihoods. Yet no evidence of legislation promoting the use of organic resources was found. There is a need therefore, for policy support directed towards the use of organic materials by low-income smallholders, who form over 80 per cent of Kenya's farming community, and the majority of who are female farmers.

3. Profit Analysis

- a) Land was the first most limiting farm resource in smallholder maize-based production systems, followed by labour and working capital. For profit maximisation, SFM technologies that give the highest return per hectare should be applied to greater areas of land, taking into account the different availability to and access of such land by different genders. Such an approach would be beneficial especially for women farmers who have limited control over land and other productive resources.

- b) Family labour was the second most limiting resource. The opportunity cost of family labour in smallholder farming systems cannot be ignored. Returns to family labour increased as one moved from good soil fertility managers to poor soil fertility managers. These results indicate that the opportunity cost of family labour should be taken as a “real” cost and must always be included in economic analyses of smallholder production systems. Labour-saving SFM technologies should be promoted, especially to reduce the extra work of women, as women also play other roles – reproductive and productive – in society.
- c) It would be more profitable for farmers in all farm typologies to adopt improved manure and fertiliser technologies, at varying levels. Adoption of such technologies would provide an integrated SFM approach to nutrient depletion depending on farmers’ gender, biophysical and socio-economic circumstances. Such an approach would ensure that all household food requirements were met in a sustainable manner from on-farm production.

Recommendations

In general both men and women in the study districts had access to and control over all the household assets; but men had more access and control over land and family labour than women did. The adoption of SFM technologies would imply investing more in land, labour, and working capital. Women have been found to provide most farm labour; yet they have least say in use of farm resources. Furthermore, they have even less say in the allocation of the benefits accruing from the investment of their time in farm enterprises. What this finding suggests is that, women’s access to and control of productive resources and benefits should be further increased in all of the study districts to enable them adopt SFM technologies that require a greater investment of these resources. Policies also need to be developed to increase and strengthen the women’s say in land matters, such as land

registration and inheritance. Such a move would enhance and sustain the productivity and profitability of smallholder farming systems, especially in female-headed households.

It was also established that the SFM status of smallholders depended on their wealth endowment. Accordingly, over 66 per cent of all farmers in all districts were classified as poor in terms of resource endowment. These farmers cannot afford high external-input SFM technologies as advocated in blanket fertiliser recommendations. Adoption of low-input high-output SFM technologies by resource-poor female and male smallholders in the central Kenya highlands should therefore be promoted actively.

Based on the key findings of this study, the following recommendations were formulated.

1. Use of manure (5 ton/ha) and fertiliser (20 to 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 fulfil technology development and transfer roles more effectively. In technology development and transfer, the profitability of the technology to the female and the male gender groups, which has bearings on the technology preferences of the male and the female farmers, should be considered. Developing and transferring SFM technologies that meet the likely different preferences, based on profitability of the technologies, of the male and the female farmers could help to transform the ill-equipped smallholder agro-ecosystems in the study sites from low-input low-output systems – known for hunger, malnutrition, and poverty – to low-input high-output, profitable systems.
2. More than 99 per cent of all smallholders in Maragwa and Kirinyaga districts were found to use organic and inorganic fertilizers, at different levels, for SFM. At present, however, there is no legislation favouring mainstreaming organic fertilizers in Kenya's agricultural sector. Such legislation could make use of organic fertilizers more widely acceptable both at farm and

all decision-making levels. There is also need for policies and institutional initiatives by the government and stakeholders that could lead to lower input prices and increase producer prices in order to encourage resource-poor farmers, especially women, to invest in soil as a capital resource.

3. Lack of affordable credit was a major impediment to intensified use of inorganic fertilisers in the central Kenya highlands. Women farmers were constrained far more than their male counterparts and were therefore unable to undertake high-external input SFM technologies, because of the high initial investments required. Consequently, the government needs to undertake policy and institutional reforms aimed at improving the capacity of financial institutions to direct more resources to the farming communities, particularly to female farmers. Farmers' organisations (co-operatives), common interest groups, community-based organisations, and non-governmental organisations should be facilitated and promoted in undertaking participatory technology development, supporting rural savings and credit schemes, and marketing, paying attention to availing saving, credit and marketing services to female farmers.
4. Poor rural road infrastructures were cited as the major constraint in the transport of produce and farm inputs, especially during the rainy seasons. Graveling and regular grading of rural access roads would facilitate affordable movement of produces and inputs between production and sale points. Lowering transport costs could reduce the variable costs resulting from the adoption of improved SFM technologies. Farmers (both the male and the female) would be able to transport farm produce more affordably and in time to capture good prices offered in the local markets and beyond.
5. Markets are very important outlets for farm produce; are sources 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 should form

'market user's organisations' to streamline market shortcomings that promote price distortions and also that hinder the free flow of market information. This could make marketing systems more efficient and responsive to farmers' needs and objectives. Such systems could also promote the well-being of women farmers, who take on the bulk of production and marketing roles.

6. The number of risk-averse, small-scale farmers, especially female farmers, who cannot afford the costly inorganic fertilisers, is high. The declining soil fertility and inability to afford fertilisers, therefore, negatively affect household food production. There is a need therefore to review gender policies so as to integrate gender analysis in NRM research for enhancing the adoption of SFM technologies in small-scale, maize-based production systems in central Kenya. The adoption of manure and inorganic fertilisers would, as aforementioned, entail increased investments in land, labour, and capital. Different genders have different access to and control over such resources. However, the adoption of such technologies would increase profits for both men and women in smallholder farming systems, justifying such investments.
7. A high proportion of the smallholder farmers are suffering from the consequences of HIV infection. Most people in the study districts are paying high prices for their irresponsible sexual behaviour. The cost of care for those affected and infected by HIV/AIDS also undermines the efforts to enhance food security, households' incomes and livelihoods. The segment of population that is critically affected and infected is the most productive age group (16 to 64 years), which constituted over 63 per cent of the population in each study area. Incapacitation of the most active proportion of smallholders has resulted in loss of labour, which is a very valuable resource in smallholder set-ups. Worst affected by shortage of labour as one of the consequences of HIV/AIDS pandemic have been women (especially the elderly women), who have to care for the infected and affected persons. More efforts to provide relevant and reliable information about the HIV/AIDS

pandemic should be accompanied by guidance on how to manage sex more responsibly. Local HIV/AIDS committees should be more innovative and play an instrumental role in promoting education and information campaigns aimed at changing peoples' attitudes and sexual behaviours. This is because healthy attitudes toward sex have not been adopted, despite the fact that extensive information about sex has been available.

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Access, Control and Use of Natural Resources in Southern Malawi: A Gender Analysis

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Introduction

Background

Women's survival, and that of their households and communities, depends on them having 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, and have learned to manage these resources in order to preserve them (WEDO 2003). Despite this, women's access to and control of these resources is far from being guaranteed. Over the years, interests in natural resources and environment have not always included concern for the role of different gender groups.

Women and youth play an important role in natural resource management (NRM) because they are usually the ones involved in the gathering and use of natural resources at both household and 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 been receiving increasing attention (Williams, Seed, and Mawu 1994) – though more action still needs to be taken. Women are, therefore, in a better position to contribute effectively towards the assessment and determination of

approaches to sustainable natural resource management for their own benefit and for the benefit of their communities.

Women and youth remain largely absent, however, at all levels of decision-making, project formulation, and management of natural resources and the environment. If they are present, for example in locally-based committees, they usually are mere committee members or secretaries taking minutes, rarely voicing their own concerns, due to cultural, political or educational (illiteracy) barriers. Factors that limit the involvement or participation of women in NRM in Malawi include lack of commitment by most government agencies to implement gender and NRM – there are very few gender and natural resource management researchers and experts. There are also very few women in influential, technical or management positions. Kweramba (2001) states that in southern Africa, water management has been regarded as a male preserve, despite the fact that women utilise and manage most of the water resources at various levels of society. Yet improvement of water services can only come about when women have a stake in all processes of water resource development, so that their needs are met. Thus gender is one of the issues that the NRM sector should take seriously in the southern African region.

In addition to women being the main managers of natural resources while having little or no access to or control over the resources, women 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, or wildlife products, it is women who have to travel long distances in order to collect water, firewood, or food products for basic household needs. This means that women are robbed of time that they could allocate to other domestic and economic activities. Women and other vulnerable groups are seldom given the opportunity to access, control or manage natural resources. This scenario is likely to worsen as conflicts arise over access to and control of these already scarce natural resources.

Thus, as UNDP (2002) commends, one of the key issues that needs to be addressed by African countries is the 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

In Malawi, gender inequality has been found to be a major obstacle to achieving sustainable development. Aware of this, in March 2000 a National Gender Policy was formulated in order to mainstream gender into all development activities. According to this policy, one of the areas in which gender disparities exist is NRM. 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 utilisation of natural resources and the environment, so as to achieve sustainable and equitable development. Other sectoral policies, such as the forestry policy, also call for making sure that women's role in forest and tree resource utilisation and management is given the necessary attention (Republic of Malawi 2000, *passim*). Although the Malawi gender policy considers the issue of gender as being crucial in NRM for socio-economic development, NRM is not amongst its priority action areas.

The research problem

Background

Malawi is endowed with a rich diversity of natural resources that include fertile soils, forests, abundant water, and diverse flora and fauna. The urban population is around 14 per cent (Government of Malawi 2002). 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 utilised, would provide a basis for sustainable socio-economic development and poverty reduction.

However, in terms of access to, control of and management of natural resources, there is inequality between the male and the female gender groups. This has 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 natural resources in the country (for example land and forestry), if sustainable development is to be achieved.

In an attempt to address the inequality between the male and the female gender groups, the following questions were posed to guide the research process: (i) what are the factors that define gender roles and relations regarding land and forest resource management? (ii) do gender roles and relations affect access to, control of and use of land and forest resources at household and community levels? (iii) do access to, control of and use of these resources affect the livelihoods of the different gender groups? (iv) what are the practical and strategic needs of the different gender groups in relation to access to, control of 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 into gender matters in Malawi has been carried out in relation to priority areas, such as gender violence and needs of the girl-child. Although the national gender policy says that women, men, girls, and boys shall be educated in sound management, conservation and utilisation of natural resources to achieve sustainable and equitable development, very little research has been done on gender and NRM. There is an ongoing project in the Department of Biology of the University of Malawi on water resource management in southern Malawi, assessing the role of gender in water resources management, but this is not sufficient. There is an urgent need to also look at other essential natural resources in the area (land, forest) in relation to gender. The present research project is therefore an additional component of already ongoing research being implemented in Malawi to address gaps in gender analysis in NRM.

Significance of the Study

According to the Malawi National Gender Policy of 2000 to 2005 (Republic of Malawi 2000), a critical analysis of Malawian society shows that there are strong traditional and cultural forces that bring about

disparities between men and women in power sharing, participation in and control over decision-making processes. These traditional and cultural forces favour men and place women in subordinate positions. For example, in the agricultural sector, about 70 per cent of full-time farmers are women. But in both matrilineal and patrilineal societies, few women take full control over the use and ownership of land resources. Women's access to credit is still low, at between 10 and 15 per cent, while that of men ranges from 45 to 55 per cent. The gender disparities that are constituted in traditional and cultural forces have limited women's participation in and benefiting from NRM and development activities.

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

Objectives

The general objective of the research was to examine and establish ways in which gender could be mainstreamed into NRM in terms of access, control and management, for sustainable livelihoods of different gender groups in the study area. The specific objectives were (i) to determine factors that define gender roles and relations in relation to natural resource management; (ii) to determine the ways in

which gender roles and relations affect access to, control and use of land and forest resources at household and community level; (iii) to determine how access to, control and use of these resources affect the livelihoods of the different gender groups; (iv) to identify the practical and strategic needs of different gender groups in relation to access, control and use regarding these natural resources; (v) to determine how the different gender groups could be integrated into sustainable management of natural resources, based on their roles, relations and needs; and (vi) to build local capacity regarding ways in which gender issues and considerations could be mainstreamed into local NRM and development activities.

Conceptual and Theoretical Frameworks

Gender refers to social differences, as opposed to biological ones, between women and men; differences that have been learnt and are changeable over time. Gender is a dynamic concept in which the roles of women and men vary greatly from one culture to another, and from 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 the will and decision of a male relative or a; in other societies women may not own land at all. In this research, class, sex, age, literacy level, and income level are explanatory variables, which will be related to the dependent variables, namely access to, control and use of resources.

Methodology

Choice of Study Area

The research was carried out in areas around three rivers: (i) the Lisungwi, (ii) the Mwanza, and (iii) the Mkulumadzi. No information in relation to gender and natural resource management was available on areas surrounding these rivers – unlike for other rivers in Malawi. Women also constituted a higher percentage of the population in these areas, thus making the areas suitable for collecting gender-disaggregated data. Interest in these rivers was 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 three rivers pass areas of various degrees of environmental degradation, resulting mainly from human activities. The rural location of the study area implies that livelihoods rely heavily on the exploitation of natural resources.

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 several questions in the questionnaire were revised and rephrased; and some were used as questions for focus group-discussions, to shorten the time taken administering the questionnaire.

Sampling

Each of the areas around the rivers was divided into three parts, representing the upper, middle, and lower sections. Questionnaires were administered for at least 10 respondents from areas around each river in randomly selected villages. At least three focus-group discussions were conducted randomly for each river. The focus groups comprised three subgroups: women, men and traditional leaders.

Some areas that the researchers would have liked to include were not accessible and this might have biased the sampling process, especially for Mkulumadzi River, because the researchers failed to reach the prescribed thirty questionnaires per river target.

Research and Instruments

In order to achieve the research objectives, and to better understand the gender issues in relation to natural resource management, the study used a number of data collection methods. These included questionnaires, focus-group discussions, resource maps and benefit analysis charts. Direct observations and document analysis of available literature on gender and NRM were also used. Together these sources provided gender-disaggregated data on the division of labour, economic factors, the use of, access to and control over resources, and the impacts of the use of, access to and control over resources on the livelihoods of the different gender groups, as well as on cultural knowledge and practices in relation to resource management.

Administration of the Questionnaire

A total of 141 questionnaires were administered in areas surrounding the three rivers. Mwanza and Lisungwi had more respondents than Mkulumadzi due to high population densities in the areas surrounding the first two rivers. These areas were also more easily accessible by good roads than the villages in the areas surrounding Mkulumadzi River.

Focus-group Discussions

The focus-group discussions comprised open-ended and semi-structured conversations with smaller groups. A total of nine focus-group discussions was carried out for all the three rivers. On each site, two focus groups, one of men only and one of women only were conducted, with each group having at least twelve and not more than twenty people. In addition, one "key informant" focus group was conducted per river, made up of traditional leaders. Traditional leaders were chosen as key informants because they are the custodians of traditional knowledge, and are in contact with the local people. They

were thus likely to know more about gender relations in their areas of jurisdiction than would government officials, who might be strangers to local cultural traditions. 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 might not have shared their views and concerns freely 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 debating social issues.

Resource Maps

The areas where resource maps were drawn included the villages of Cimbwinda for the river Mwanza, Zidala for the river Mkulumadzi and Lisungwi for the river Mathotho. The maps were drawn by focus-group members, to examine the different resources used by women and men gender groups and to determine 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 members. The purpose of the exercise was twofold: (i) to map out those resources thought to be associated with the dominant socio-cultural categories of “women” and “men”; and (ii) to map out spaces actually used by the gender groups. This was to enable the researchers to identify 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 each, one group of women and one of men, each group including both young and elderly people. The groups were asked to map out the spaces, places, and resources used by women and men. This exercise revealed local social ideals regarding gender roles and use of spaces and resources. The researchers also examined gender roles and the use of space as it occurred in everyday life.

The researchers then asked the participants to point out, and comment upon, key places, features (such as their homes or a nearby road), structures, and resources important to them. The participants were asked to identify and draw key places or spaces that were

essential (or peripheral) to their daily activities, and places or spaces which they perceive to be important to “men” and “women”, and to themselves personally. The participants were not interrupted unless they stopped drawing, in which case questions were asked to prompt them to continue.

During the map-drawing exercise, the researchers gave attention not only to what spaces and features were represented but also to how they were represented – for example, whether certain features were drawn on a larger scale (indicating relative importance), whether spaces that were designated as “men’s” (in the men’s group discussions) were represented on women’s maps, and vice versa.

Benefit Analysis Charts

Benefit analysis charts provide in-depth detail about who uses and benefits from particular resources. In this case the analysis was done using information from the resource maps drawn by focus-group members. The charts gave useful data on who actually benefited from the different resources, in terms of access, control and use. The researchers explored why women and men use the natural resources they use (i.e. what benefits they receive from particular natural resources) by examining the attributes that women and men ascribe to these resources – nutrition, medicinal use, and so on. The analysis also explored who held traditional knowledge and who commonly sells which resources to local or regional markets. Men and women completed their benefit analysis charts separately.

Gender-disaggregated Data

Alongside the disaggregation 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 household and community levels and to determine the role played by such dynamics in influencing the ability of resource users/managers to manage natural resources.

Ethical Considerations

The research involved collecting data on income levels and literacy levels, and also involved interviews with local leaders. The research team made sure that the data was handled confidentially. Since the researchers were already familiar with the area, they were able to treat participants 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 would be used. To gain the confidence of people, a representative from the district commissioner's office introduced the research team before any work started.

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 mainstreaming gender in NRM, and other development activities.

Data Analysis and Interpretation

The SPSS software was used for the data analysis. Also content analysis was used to examine interpretations and implications of information from focus-group discussion resource maps and benefit analysis charts, which included documents and observation reports. Simple statistical tools, such as percentages and cross-tabulations were used for content analysis. An analysis and interpretation of the gender-disaggregated data was done to reveal the interconnectedness of the activities of women and men in natural resource management. Answers from key questions were used to help in the analysis of information from the focus-group discussions and questionnaires. This approach allowed for comparisons of different respondents, and enabled in-depth analysis.

Gender resource maps enabled the researchers to explore and analyse the 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 the analysis of the maps and map-related discussions and observations, the researchers looked for the spaces, places, and resources which women and men have access

to, control of and made use of, and what those spaces mean to women and men, to determine which spaces meet particular personal, practical and strategic gender needs.

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

Results and discussion

Household Characteristics

Of the interviewees, 66 (44.7 per cent) were men and 78 (55.3 per cent) were women. This was similar to the official sex ratio of men to women of an average of 1 to 1.1 (Government of Malawi 2001). There was a good representation of different age groups among respondents, with more than 70 per cent of the respondents in the 'adult' category (21 years old or above). This meant, however, that views of the youth component of the gender groups might not have been captured fully in the study. In terms of the cultural aspects of gender, older people had, however, more knowledge regarding customs, norms, and values.

A large proportion (71.6 per cent) of the respondents were married, 16.3 per cent were single, 7.8 per cent widowed, 2.1 per cent divorced, and 2.1 per cent separated. The fact that a large number of respondents were married was helpful because it allowed data to be collected with regard to gender roles and relations at household level. Most of the people interviewed (62.4 per cent) had 1–5 children, 22.7 per cent had no child, and 14.2 per cent had 6–10 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; it was also an indicator that cultural norms were still respected.

According to the Government of Malawi (2001), approximately 70 per cent of those engaged in enterprises were in petty trading, with 20 per cent involved in agro-business. Men had higher rates of employment than women, and some were self-employed, for example as carpenters. The fact that women had low literacy and education levels was found to have limited the work they were able to do. Few of the women with low literacy and education levels could be employed in the formal sector, so they were mostly restricted to staying at home and performing household tasks, working on their farms and carrying out petty trading in small roadside markets. 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 fruit.

Providing for the family was women's priority. Women indicated that they exploited most of the natural resources in the area to ensure food security in their homes. The fact that they had to take on this role at an early age meant that they dropped out of school earlier than their male counterparts, or did not even attend school. Due to their domestic responsibilities and low literacy levels, none of the women interviewed was employed, nor did they have the technical skills to be self-employed.

Regarding education, 66 per cent of the respondents had attended primary education; 19.9 per cent hadn't attended education at all; 13.5 per cent had attended secondary education. Only 0.7 per cent had attended tertiary education. When the data were disaggregated by gender, it indicated that women were the least educated segment of the population: the number of women who had never been to school was twice the corresponding figure for men. There were, however, equal numbers of men and women who had received primary education. More girls tended to drop out of school, and three times more men than women had secondary level schooling.

Though societies in the study area were matrilineal, males were still considered to be heads of households. Seventy three per cent of the respondents came from male-headed households, 12.1 per cent from female-headed households, and 14.9 per cent said there was no head

of household, and very few (0.7 per cent) did not know who the head of their household was.

The majority of people in this area follow a matrilineal descent system and matrilocal settlement patterns in which, after marriage, men live at their wives' homes. One might therefore expect women to be dominant in decision-making at household level. However, this was not the case; despite men coming in from the outside, they still played a cultural role of being decision-makers in the household. The research data indicated that women respected men and considered them to be household heads.

Further data analysis indicated that widowed women considered themselves as heads of households, but divorced and separated women felt that, once the man had left, there was no head of household, even though the woman herself was still there. This indicated the deep-rootedness of traditional gender roles that has resulted in women being excluded from decision-making.

According to WEDO (2003), traditional assigning of responsibilities to women and men has resulted in political, cultural and economic barriers that restrict even 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 Resources of the Study Area

The respondents were asked what natural resources existed in their 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 there was no longer wildlife near Mwanza river, but wildlife still existed in areas surrounding the other two rivers. As borne out by field observations, Mwanza river was surrounded by deforested land, and was the most densely populated of the three study areas.

Good road networks and trade centres gave rise to large settlements of people in areas surrounding Mwanza river. The consequent

population pressure led to habitat destruction, which in turn resulted in the disappearance of wildlife resources from areas surrounding the river. In addition, deforestation caused heavy siltation in the rivers, especially Mwanza and Lisungwi, which affected fish populations due to the destruction of breeding sites. In addition, some respondents reported that, in certain years, Mwanza river even dried up during the dry season. Generally, the state of natural resources was very poor; land resources were degraded; and soil erosion and lack of nutrients had considerably reduced agricultural productivity in the area. Deforestation was commonplace because of continuous very large scale charcoal production, with a total disregard of future implications. This would affect especially the women, who were responsible for fuel wood collection for domestic use. In Malawi, it was found that 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 forced to travel further and work harder when fuel wood or charcoal got scarce; so clearly deforestation is not only damaging to the environment but also causes women to spend more time looking for fuel wood in addition to obtaining water and food (WEDO 2003).

Forest resources on customary land and newly gazetted reserves were under constant pressure from local inhabitants for fuel wood, medicine gathering and income generation through charcoal selling. The 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).

Mwanza and Neno districts have a poverty head count of 71.4 per cent, indicating more people were economically badly off than in other districts in the Southern Region of Malawi, or the country as a whole (The average poverty incidence was 68.1 per cent for the Southern Region and 65.3 per cent for Malawi as a whole) (Government of Malawi 2001). Government of Malawi (2001) also indicates that there was a greater degree of subsistence orientation among poor households, thus subsistence production dominates the rural economy. The fact that

this subsistence economy was based on natural resources means that any scarcity of natural resources would have very serious implications on the livelihoods of the population. These implications would be most serious for the vulnerable gender groups, mainly women and children.

Most respondents indicated that the three rivers had been used to provide fish to the surrounding communities in the past, with many local fish species in existence. However, fish populations have declined, because heavy siltation in the rivers is destroying their spawning areas, as well as due to traditional fish poisoning methods which have been killing even the fry and fingerling, and the increase in demand as a result of population increase.

There were a number of fish farmers in the districts surveyed, especially in the Mkulumadzi river areas of Neno (Government of Malawi 2001). Although most respondents in this study indicated that women were involved in fishing more than men were, fish farming seemed to be the responsibility of men.. Of the 431 fish farmers in the district, however, only 35 were women, representing just eight per cent of the total, according to register list of fish farmers in the district. There was a need to incorporate women in fish-farming programmes in the area because of their interest in fish as an important source of protein for their households.

Definition of Gender Roles and Relations

At Household Level

Results from this study clearly indicated that there are certain roles that are specifically associated with the different gender groups and others that are not. Predominantly male roles were house construction, land cultivation and charcoal making, while drawing water, fetching firewood, fishing and domestic tasks such as cooking, washing, cleaning, and taking care of children were predominantly female roles at household level. Cultivation, grass cutting, and tree planting are performed by both men and women. There seems to be a tendency for women to play multiple roles, and for men to have specific roles and

not help women with household chores. Few of the women's roles were transferable to men. When asked to indicate spaces associated with the dominant socio-cultural categories of "women" and "men", the respondents indicated mainly the household and the river were spaces occupied by women, while spaces away from home, where forest and land resources occupied mostly by men.

Further analysis of data by sex showed the same trend, with both sexes perceiving certain roles as male roles, other roles as female roles, and some others as roles for both. There was no male who indicated that domestic tasks like water collection, fetching fuel wood were male roles. None of the interviewed women indicated that water collection, fishing, and fetching fuel wood were male roles. However, some women mentioned that women do indeed participate in tasks that had not been assigned as female roles, such as building and grass cutting. Cultivation and tree planting were considered shared roles by both sexes at household level. It should be noted, however, that both men and women may fish, collect fuel wood or even cut grass, but use different tools and techniques.

In the case of the youth, high percentages of the respondents (70.9 per cent of girls and 75.9 per cent of boys) seemed not to have known what their roles were. However, for those who did respond, 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 tallied by and large with the roles of women, and the roles of boys tallied with the roles of men, was an indication that gender roles were constructed at a very young age.

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

At Community Level

The roles that different gender groups played at household level did not differ from the roles indicated for them at community level. Fetching fuel wood, collecting water, and doing domestic tasks were roles performed exclusively by females. The midwifery role of women was also mentioned at community level as a purely female role. Nobody indicated any of 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 were at household level.

For men, building and hunting were seen as 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 classifying building as a role for women. This might be because most women would not feel safe offending society at large by performing roles that were normally considered by society to be male roles.

In the case of girls and boys' roles at community level, drawing water and fetching fuel wood were considered to be tasks for girls only, and building and charcoal making for boys only. This seemed to agree with adult gender roles that were mentioned for men and women. Thus, at community level, gender roles were clearly defined from a young age and were likely to be maintained. This strictness in differentiating roles may have come about due to fear of ridicule at community level- as compared with at household level- for failure to adhere to cultural and traditional rules.

Most respondents indicated that they did not want to be seen as acting against what were considered cultural norms or customs by performing roles not considered proper for their sex in society. Households in a community are linked by such criteria as kinship, ethnicity, gender, and geographic location (see also Moser 1993), so decisions were based on what extended family members and neighbours perceived about the roles people play at both household and community levels.

Focus-group discussions were 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 at both household and community levels. They mentioned the kitchen, along the river banks, at boreholes, shades of big trees and forests as the spaces they used in relation to NRM. They used the kitchen for food preparation, the river for fetching water, fishing, bathing and washing, the boreholes for fetching water, big tree shades for pounding maize, and forests for collecting firewood – all in conformity with gender roles. Men, on the other hand, listed the spaces they used as the forest (for collecting building materials and for charcoal making), along the river (cutting reeds for weaving mats and irrigation), homes and graveyards – again spaces which tended to be influenced by their gender roles as breadwinners and providers of shelter in the home.

Construction of Gender Roles and Relations

The respondents were asked to freelist factors that have led to the construction of the different gender roles and relations that exist in respect of natural resources management. Accordingly, they listed; inheritance of cultural perceptions, beliefs and customs, local authority, and government. Over 70 per cent of the respondents said they feel that culture was the most defining factor of the various gender roles and relations existing in their area. This came as no surprise, given the way gender roles at household and community levels had been defined, as presented in previous sections. Triangulation of data with focus-group discussions gave similar findings.

Participants of all focus-group discussions indicated inheritance and differences in physical strength between men and women as factors determining gender roles. 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 (that the roles women and men play are those they feel they have to perform), and inborn talent (the roles that individuals adopt are expressions of the skills they are born with. The

availability of resources and poverty were also mentioned as reasons for roles differing according to gender. Cultural inheritance of beliefs, customs and perceptions construct gender. Thus, the fact that chiefs and village headmen had to make sure that gender roles were adhered to indicates that, in this society, gender roles and relations are constructed culturally and socially.

Maintenance and Enforcement of Gender Roles and Relations

Gender roles and relations were maintained in rural Malawian society because of the need for development, and respect for authority, unity, and cultural values. Almost everyone that was interviewed expressed the view that individuals must develop personally, with their own roles in their household and within society. In addition, those who contradicted cultural norms and values in relation to gender roles and relations were seen as disrespectful to 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 can take many forms and can be costly to offenders (it was usually a fine imposed by the chief in the form of livestock, such a chicken, a goat or a cow).

Rooting of Gender Roles and Relations

In all the areas surrounding the three rivers, the majority of respondents indicated that gender roles and relations are deeply rooted within their societies. Roughly 20 per cent of all respondents said they feel that the rooting of gender roles and relations was moderate; less than 11 per cent said they feel these roles and relations had little rooting in society. Considering that punishment, respect for local authority and cultural values still enforced and maintained the roles and relations of different gender groups, it was to be expected that the roles might still be strongly rooted within society; and an analysis of results confirmed these observations.

Assignment of Gender Roles in Household Activities

The respondents were asked whether they assigned household activities by gender. This was done to determine whether cultural inheritance of gender roles and relations was done through assignment of activities from a young age. More than 50 per cent of all respondents indicated that they did tend to assign household activities based on the sex of their child, while the remainder said they did not. This assigning of household activities according to the sex of the child prepared children for the roles they would perform as adults. This partly explained why most of girls' roles were similar to women roles, and boys' roles were similar to those of men.

Most male respondents said they assigned household activities based on the gender of the child, while most female respondents said they did not. Males were much clearer in their minds than their female counterparts were about which roles they considered as male roles and which as female; yet males did not feel there was much rooting of gender roles and relations. Men did not seem to realise that women played many more roles at household level than men did. As a consequence, 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 Roles with Cultural Perceptions

For all the areas surrounding the three rivers, more than half the respondents felt that gender division of roles corresponded "to a large extent" with cultural perceptions; about 30 per cent felt gender division of roles corresponded "to a medium extent" with cultural perceptions. This showed that culture was not eroded within these societies, since gender roles and relations were in line with what were considered cultural norms. In the areas surrounding Mwanza river, there were some people who felt that gender division of labour corresponded only with cultural norms "to a limited extent". This was to be expected as some villages surrounding Mwanza river were close to urban centres

where some cultural norms and customs were not followed strictly, while the areas surrounding the other two rivers were mostly rural.

Gender Division of Labour and Cultural Norms

Most respondents in all the areas surveyed said they feel no contradiction between gender division of labour and what were considered cultural norms. However, some respondents indicated that some men were playing female roles at household level – roles, such as collecting water and cooking – even though their wives were not sick. This was seen as contradicting cultural norm as these roles were considered exclusively female roles.

Triangulation of data from all research tools in the study revealed that the most important factor determining gender roles and relations was cultural inheritance of beliefs and the perception that women and men had different roles to play in natural resource management. There was social construct of female and male gender roles in relation to NRM. That construct of gender roles in NRM was inherited from parents through what an individual had been taught as cultural norms and values, and it (i.e. the social construct of gender roles) made men and women interact differently with the environment and natural resources, depending on the roles assigned to them at household and community levels.

Results from five of eight focus-group discussions- indicated that gender division of activities conformed to normative ideals, while the other three groups indicated that they did not conform to normative ideals. These three groups were all key informant groups, made up of traditional leaders who know what happens in their areas of jurisdiction and, as indicated by some respondents, there had been changes in gender division of labour due to external influences, such as gender mainstreaming activities and the media. This was an indication of the beginning of socio-cultural changes in gender issues in the area.

Embedding of Natural Resource Management within Cultural Practices

Further analysis was done to find out whether NRM activities were embedded within cultural practices and beliefs. For all areas

surrounding the three rivers, more than 70 per cent of the respondents, both the female and the male respondents, indicated that NRM activities were embedded in cultural practices and beliefs. These meant that programme designers should consider the cultural aspects of conservation when NRM programmes are being designed for an area, and try to understand the gender roles and relations embedded in the beliefs of the people, so that they can better involve different gender groups in these programmes. The respondents mentioned that examples of NRM practices embedded within cultural practices and beliefs included prohibitions against cutting of trees, killing of animals or collecting soil from graveyards; prohibition against cutting certain trees near homes because those trees provide good shade; prohibition against cutting certain trees in the fields because they increase soil fertility; prohibition against cutting medicinal trees; prohibition against killing some animals, for example owls and animals that are not regarded as food; prohibition against burning of grass.

Respondents expressed some concern that if gender mainstreaming would be taken too far, it could result in certain cultural aspects of conservation being lost. Gender roles were culturally constructed, and NRM activities embedded in cultural practices and beliefs, so that access to, use of and control of natural resources by different gender groups would depend on what was considered the cultural norm.

Other NRM activities that were indicated by participants of focus-group discussions as activities embedded within cultural practices, included water fetching skills; food preservation skills; construction of firebreaks around natural resources; planting certain indigenous trees that increased soil fertility; preserving traditional medicine – tree; soil improvement skills like compost making; making hoe handles from small branches of 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, techniques and

skills were passed on from parents to children based on the gender roles they perform at both household and community levels.

Effects of Gender Roles and Relations on Access to Natural Resources

Accessing natural resources was done by different gender groups. Water was mostly accessed by females because females collected water for household tasks, 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. There were, however, some respondents who said that land was mainly accessed by only one sex, and most of these respondents said that it was by males. Fisheries resources were mostly accessed by both males and females. All these results agreed with the findings of Meinzen-Dick *et al.* (1997). Cultural norms also differentiated the way men and women were allowed to use forest resources.

When the data was analysed further by gender, it was found that forest, land, wildlife, and fish resources were the resources that most respondents felt were predominantly accessed by males. Thus, out of the six natural resource components for which gender-related data were gathered, four were accessed mostly by men, while females accessed mainly only one resource, water. This means that women's access to resources was limited by their gender roles, which were in turn determined culturally. According to Meinzen-Dick *et al.* (1997), the gender differences faced by women in access to natural resources 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.

Compared to other parts of southern Africa, it is instructive to note that it is a provision by Tswana customary law that everyone should have access to land, but in reality, access to land is differentiated by gender. Studies carried out in Southern African Development Community (SADC) countries indicated that women did not enjoy similar rights with men do concerning access to resources: within most communities,

rights and access to resources were often organised 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 had implications for their livelihoods, since the resources that women accessed had low economic value compared to those that men accessed, i.e. forest resources, land resources, and wildlife resources. Access to and control of resources is one of the principal factors determining the economic and social wellbeing of women (Bashaw 2004).

Results from the focus-group discussions in this study indicated that differences in access to resources were based mainly on differences in gender roles. Respondents believed that differences in strength between men and women made men able to access most of the resources, especially forest products and wildlife resources. Women do not, for instance, have the strength to cut down 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 authorisation from chiefs to access certain resources, such as land and trees. Division of labour at household level was another reason given as affecting access to resources. For example, men could not access water resources because it was not their role to collect water, so they had to wait for women to provide water. There were, however, some respondents who felt that there was no problem in access to land resources for all gender groups.

Control of Natural Resources

Even though most respondents said they felt that 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 did so was less than that of 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 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 had use and access rights to most resources but no control over them. Francis (1995), in her study of Luo households, found that women had fewer spheres of decision-making power than men had. Also in the present study the differences between the two sexes were considerable when it came to control of the different natural resources, especially those that had economic benefits, such as land and forest and wildlife resources.

Despite the study area being a matrilineal society where land inheritance passes through the female line and men go to settle in their wives' home villages, men still had greater control of land resources than women had. In focus-group discussions it was mentioned that women, since they had little control of natural resources, were sometimes denied access to and use of certain resources, and in certain cases had to seek consent from men before accessing natural resources. Personal observation during resource mapping revealed that men tended to be very particular about boundaries and knew the village boundaries better than women did. Despite the society being matrilineal, when a man got married into a family, he was taken to be shown the land and village boundaries. Even though women traditionally owned the land, in reality men were in control of the resource.

In many African societies, regardless of whether they were patrilineal or matrilineal, only usufruct rights of land were conferred on women (Flintan 2003). In practice, men control nearly all the property, despite women having the legal right to own land or trees. Von Bülow (1992) found that, in Kipsigis society in Kenya, men had ultimate rights in most important productive resources, such as land and livestock. Also Sørensen (1992) found that economic changes have negatively impacted on gender relations by widening the gap in resource control between men and women in Kipsigis society. This means men are taking

increasing control over resources; while women are losing control over the resources. The present study found that the commercialisation of natural resources had widened the gap between resources that women and men control in areas surrounding the three rivers. Examples were the commercial exploitation of forest resources for charcoal making and selling, as compared to subsistence exploitation for firewood, and the commercialisation of land as a source to be rented out rather than being used for food crop production.

Effect of Natural Resource Use, Access and Control on Livelihoods of the Gender Groups

The fact that there were differences in how the 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 these differences. They were affected in the sense that because men controlled most of the resources, especially those offering higher economic benefits, women had to ask permission from men before accessing or using them. Women reported that they were sometimes denied access to certain resources, especially those with good economic value.

Men countered that charcoal making, which was relatively profitable, was not a business venture for women because what the activity involved was not considered the cultural norm for women. Men also felt that access to, use of and control of land resources was affecting their livelihoods because of the matrilineal '*Chikamwini*' system, in which men must join their wives once they are married and live in the woman's home and cultivate her land. In addition, both men and women felt that recent environmental degradation meant that most natural resources could not be easily accessed, which was affecting their livelihoods negatively because they depended on these resources for food and income-generating activities.

Women in the study area were relatively disadvantaged compared to men in terms of access to essential resources, and this was coupled with a high illiteracy rate among women. Women were thus mostly

limited to farming and other domestic tasks rather than being involved in economic activities (Government of Malawi 2001) and this negatively impacted on their livelihood status as well.

Gender Aspects of Cultural Differences

Respondents from the Ngoni and Mang'anja tribes (respectively 62 per cent and 58 per cent) felt that differences in access to, use of and control of natural resources negatively affected women's livelihoods. Most Chewa tribe respondents (58 per cent), however, felt that these differences did not affect their livelihoods. Chewa women exercise considerable control over land resources: women have rights over land allocation and use because they inherit it from matrikin in their natal villages, and also participate in matrilineal social support networks. This might explain why most Chewa women respondents indicated that differences in access to, use of and control of natural resources did not negatively affect their livelihoods.

Differences in outlook on access to, use of and control of natural resources depended on relations between men and women within society, and were based on cultural aspects of the different tribes (ethnic groups). For example, the Ngoni and the Chewa assign different activities based on the sex of the individual, while the Mang'anja did not assign activities based on sex. 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 that might determine whether or not access to, use of and control of different natural resources would negatively affect the livelihoods of different people.

Further analysis of data revealed that differences in access to, use of and control of natural resources by the different gender groups had 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 and more time spent on activities, such as looking in far places for firewood and water. Decreased access to a

resource meant that fewer people used it, which could result in the loss of traditional knowledge and practices, for example collecting medicine, hunting traditions, and local technological skills, such as traditional fishing technologies, and even loss of cultural sites.

Use of Natural Resources for Poverty Alleviation

Most respondents felt that forest and land resources contributed most to poverty alleviation for both men (through selling forest products and charcoal) and women (selling fuel wood), even though more respondents mentioned men as the main beneficiaries. Land ownership alleviates poverty through short leases and selling, and since land belongs to women in this matrilineal society, it is surprising that also men benefited from land lease and selling. In fact, more respondents (63 per cent) perceived that men benefited more from land resources than women did. Although women traditionally have rights to use or lease land, the money collected from leasing or selling land goes to men.

Albeit to a lesser extent than contribution from land and forest resources, also wildlife and mineral resources contributed towards income-generation for both men and women – through the selling of wild meat and of pottery products. Respondents indicated that more women (44 per cent) generated income through selling fish than men (two per cent) did and through access to fish resources for food. Since fisheries resources were dwindling, they had reverted to being used primarily by women. Many respondents felt that more men than women alleviate poverty through selling forest, land, wildlife and mineral resources. The fact that the different gender groups had different levels of exploitation of different natural resources implied differences in benefits derived from these resources, and hence their differential impacts on livelihood and poverty status.

The poverty conditions experienced by millions of women across the world are closely linked to the limitations they confront in gaining access to resources, among which are natural resources. It was apparent from the study results that only women were responsible for food in the home, and none of the respondents indicated that men used

natural resources for food in the home. Men mostly exploited natural resources for economic gain, while women exploited resources for both food and to a lesser extent economic benefits. In other words, women exploited resources for subsistence purposes, but men used the resources for commercial purposes. In theory, the commercial exploitation of resources, such as coal burning, ought to place a heavier load on the environment than small-scale subsistence exploitation. We should expect, therefore, women to exploit natural resources in a less damaging manner than profit-oriented men did. However, most respondents indicated that irrespective of gender differences, natural resources were becoming scarce because they were being overexploited in the area.

Scarcity of resources such as forests and water tended to increase the burden on women, who often have to travel long distances to reach them. If poverty, especially among women, is to be alleviated, there is a serious need to ensure equity between men and women in access to and sharing of the benefits arising from utilising natural resources in the areas surrounding the three rivers. Poverty-reduction strategies must pay serious attention to reducing gender disparities in relation to access to and control of resources – especially major assets, such as land, since the incidence of poverty was highly correlated with lack of access to land (Bashaw 2004).

Natural Resources and Food Security

Respondents rated natural resources in the following order of importance: fish resources (72 per cent), land resources (67 per cent), forest resources (50 per cent), wildlife (49 per cent), water (24 per cent) and lastly minerals (2 per cent). Fisheries resources are an important source of protein for the people in the area where they use it as relish (i.e. served with *nsima*, maize “mash”). In Malawi, over-exploitation of fisheries in Lake Malawi has led to a decline in fish production of nearly 40 per cent, which is particularly significant since fish contributes 60–70 per cent of the total animal protein consumption (Aditya 2007). Respondents of the current study said that by selling fish they could

buy other food items, such as maize, thereby ensuring food security in their homes.

Land resources ensure food security because the land can be cultivated and food produced for home use. The great majority (90 per cent) of the population in the study area was informally employed in subsistence agriculture, with 90 per cent of the land planted with maize, the staple food in the country (Government of Malawi 2001). It was noted in the study that 74 per cent of the respondents were farmers, with 44.6 per cent of the total being women. Some cash was also generated by leasing or selling the land to make money available for buying food. Leasing of land was much preferred to selling because of fear of alienating customary land. Land resources were especially important for women who were mostly involved in farming – because of their low education and high illiteracy levels, and because it was they who were mainly responsible for food security in the home.

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

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

Food insecurity and malnutrition in rural Africa could be attributed partly to lack of access to and control over land (SARDC 2000). In certain cases, it was often the men, because of their control over land resources, who made the decisions about which crops to plant on what land, and on whether these should 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 generated from sale of the crops. As in most matrilineal societies, Chewa women have considerable control over land, increasingly; however, men may control production on the land, even though tradition holds that men have no say in the inheritance of

their wives' land as they enjoy such land rights only in their mothers' villages.

Natural Resources Valued by Different Gender Groups

The study results revealed that men valued forest and land resources; women valued forest and water resources; girls valued water and forest resources, while boys valued forest and water resources, in that order. Respondents indicated that men valued forest and land resources most because they use forest resources for building, construction, and charcoal making, as well as using grass for thatching houses.

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

The respondents felt that women value water and forest most, followed by land resources. Water was highly valued because women's daily household tasks required water 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). Boys valued forest resources most because of charcoal-making business and for fruits. Girls valued water and forest resources most, just like women, because they were involved in helping women in domestic tasks. Resource maps drawn by men tended to show more places where forests and farmland (farms) were located, indicating that these resources were mostly associated with the socio-cultural category of men. Benefit analysis charts also showed that men benefit most from selling the natural resources which they valued.

Needs in Relation to Natural Resources Management

Men's short-term needs, as given in the questionnaires, included tree seedlings, boreholes, employment, farming facilities, irrigation facilities, business loans, livestock breeding stock, food, and tarmac roads. Results from the FGDs showed the same responses for men's short-term needs as those from questionnaires, although the discussions mentioned also beekeeping as well as men's desire to be employed so that they could stop charcoal making, which is destroying the environment. The men's needs were thus related to their gender roles as breadwinners and providers of shelter. Men needed all these things so that they could generate more income from resources – for example, more trees meant more charcoal production, which would need transportation by tarmac roads.

Results from men's FGD revealed that men's short-term needs constituted 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 NRM and schools.

Women's short-term needs, as given in the questionnaires, included boreholes, tree seedlings, irrigation facilities, business loans, food, farm facilities, maize mills and health facilities. These needs were related to their gender roles of doing household tasks, farming and taking care of the children. Moser (1993) states that gender division of labour within the household gave women responsibility, not only for domestic work involving child care, but also for family health and food provision. She describes women as identifying their practical gender needs with a focus on the domestic arena and on income-generating activities; this was corroborated by the findings of the present study.

Boreholes would ensure a constant supply of safe, clean water, therefore lessening the burden of travelling long distances to collect water which might, in addition, be contaminated and thus be a cause of disease. Tree seedlings would – ultimately – ensure an energy supply in the home, while farming and irrigation facilities would help ensure

food security. Most female respondents were involved in petty trade and thus generated some income that they could use in the home. In the FGDs the 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 needed health facilities too. As in the questionnaires, these discussions gave boreholes, tree seedlings, irrigation facilities, food, and farm inputs as short-term needs. They also mentioned bee keeping, fish farming, markets, adult education and civic education in NRM.

Girls' short-term needs included boreholes, food and schools. Boreholes were needed, since their roles were in the household where they often helped their mothers to collect water. Food was crucial for girls – as it was for women – because of the nurturing roles they played in the home, and because they could not go to school hungry. Also nearby schools were needed so that pupils would 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 systems for boys who were involved in charcoal and fruit selling. Sometimes boys helped in the household collection of water thus they wanted easy access to safe drinking water. Just like girls, boys needed nearby school facilities so that they would not have to travel long distances to access education.

Results of FGDs that involved traditional leaders as key informants gave the following as their 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 (i.e. payment in kind in lieu of wages), more agriculture and forest extension workers, and empowerment of traditional leaders to enforce NRM regulations.

The responses of key informants overlooked the most important need of women, which was safe drinking water from boreholes. This could have been due to the fact that traditional leaders were mostly men. Only one woman was encountered as a traditional leader in the

FGD conducted in Mwanza river area. However she did not mention what women mostly indicated as their number one priority in the area, namely boreholes to provide safe drinking water, and thereby avoid water-borne diseases. This could have been because it was mostly men who were able to articulate and promote issues relevant to them. A consequence of this was planners failing to recognise women's needs – and also the fact that women and men have different needs, preferences and priorities (Flintan 2003).

Conclusion

Gender roles and relations regarding NRM in the areas surrounding Lisungwi, Mwanza, and Mkulumadzi rivers were socially constructed and defined by cultural perceptions of what women and men's gender roles were. These gender roles and relations were maintained by being passed on by parents to their children through generations. However, in some areas cultural perceptions are changing, with certain gender groups performing gender roles that had not been considered the cultural norm. Socially constructed gender roles and relations have brought about gender divisions of labour and responsibilities which have, in turn, differentiated the ways in which men and women relate to and use natural resources, based on their gender roles at household and community levels.

Gender roles and relations affected access to, control of and use of natural resources. Use of resources depended mainly on gender roles both at household and community levels. Women used the resources they needed for carrying out household tasks, such as collecting water and firewood, child rearing, preparing food and medicines for the family. Men used resources as breadwinners and protectors of the family through the selling of forest products, such as charcoal, and through 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 who had control over the resources: at household level women had to seek access authorisation from men, and, in some cases, men had

to seek authorisation from local authorities to access forest products, wildlife and land resources. Social divisions, such as age, status and ethnicity were also important in defining who had access to and power over use of resources at community level. 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 all resources except water for domestic use.

Access to, control of and use of resources were all found to affect the livelihoods of the different gender groups. Lack of access to water resources meant that there was no water for use for household tasks by women, which meant women had to travel long distances and invest more time in collecting water. Lack of access to food resources, such as fish, fruits and wildlife meant less food at home. Lack of access to and control of income-generating resources, such as forest and land resources meant less income for most households. In addition, lack of access to and use of natural resources meant loss of cultural practices concerning those resources, management and use of which were embedded within cultural practices.

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

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

Although there had been some gender mainstreaming programmes in the area, there had not been any clear identification of different

gender needs in relation to NRM. Because communities in the study area depended mostly on natural resources for their day-to-day needs, determining the different needs of the different gender groups was important so that the different gender groups could be effectively incorporated in natural resource use and management activities. For example, women indicated that they would like to do fish farming, yet fish farming projects in the area were predominantly men's role. Men and women had different needs and priorities in relation to NRM and these could be identified only by using gender analysis—as was the case in this study. Identifying these differences is important because ignoring them could have adverse impacts on NRM.

In the case of the study area, degradation and over-exploitation of resources seemed likely to continue, with conservation efforts having little or no impact. This was the case because, as 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 these resources. They thus bear different costs and reap different benefits in using and protecting these resources. A clear understanding of gender and social roles and their consideration is essential for the sustainable utilisation of natural resources.

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5

Gender Analysis of Risks from Exposure to Chemical Contaminants among Kirinya Wetland Resources Users in Jinja District of Uganda

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

Introduction

Gender refers to the different social roles that women and men play, and the power relations and processes between them (Lwanga 2001; Sass 2002). Gender analysis is a systematic examination of these roles, relationships and processes, in respect of women and men, focusing on the imbalances between them (Sass 2002). In Uganda, in the early days of gender mainstreaming advocacy, prominence 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 natural resources management (NRM).

Lately, however, many researchers have come to realise that men and women cannot be treated as identical actors in the process of environmental collective action, and argue further 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 (Sass 2002). **Men and**

women also have different interests and preferences in natural resource conservation, and face different constraints in participating in natural resource management institutions (Agarwal 2000; Sass 2002).

Understanding women and men's relationships with the environment plays an important role in developing solutions leading to more sustainable use of natural resources (Sass 2002). **Neglecting gender not only leads to a mistaken assessment of existing community institutions for NRM in terms of participation, distribution equity and efficiency, but also distorts the understanding of human impacts on the resources (Sass 2002; Agarwal 2000). This can lead to the suppression of opportunities for forming and sustaining successful resource management groups through women's more substantial involvement.** Agarwal (2000) discovered that there were institutions which appeared successful after group functioning had been assessed – for example in participation, equity and efficiency – but nevertheless 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 resources.

The present study was initiated as a gender analysis of the risks of potential exposure to chemical contaminants among Kirinya wetland resource users. It was 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 the wetland resource.

The undertaking contributed to a multidisciplinary research project sponsored by 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 radioisotopes 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 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 had accumulated low levels of total mercury (Muggide *et al.* 2005). Nile perch weighing between 0.13 and 0.8 kg contained an average mercury level of 367 ng/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 200 ng/g in fish weighing between 3 and 10 kg (Muggide *et al.* 2005). Their socio-economic profiles indicated that over 80 per cent of the respondents consumed fish three or four times a week, sourcing it mostly from the neighbourhood wetlands or landing sites, or from local markets (Muggide *et al.* 2005).

Gender analysis was missing in the afore-mentioned ongoing VicRes project (Muggide *et al.* 2005), and this study helps to fill that gap. It is understood that men and women often perform particular activities in wetland natural resource utilisation which may result in encroachment on the area, and each gender group attaches different values to activities carried out at the site. Youth, men and women carry out the same activities for different reasons, and at different times, so their levels of health risk and potential exposure to contaminants may vary. Such aspects were not considered in the ongoing VicRes project but were addressed later – in this gender analysis study. This study was further motivated by the fact that women and children spend more time at home, with continuous contact with polluted water and hence faced higher risks of exposure to contaminants. Men often spend most of their time at work sites in town, away from polluted and contaminated environments.

Environmental degradation has impacted on the flora and fauna of the wetland habitat, resulting in a change in the composition of wildlife resources: fewer fish, more monkeys, and a total disappearance of certain wildlife species. Changes in wetland resource use were also extensive; there was increased utilisation of the resource, for example, increased gardening, and more 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 – in other words, which gender group's activities impact negatively on what wetland resource – are not understood clearly.

Use of Wetlands in Uganda

Wetlands in Uganda include all those areas where plants and animals live in association with permanent or temporary flooding (NEAP 1990). These wetlands are estimated to cover about 13 per cent 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 in addition are sources of fuel, raw materials for building and construction, and handicrafts. In urban areas, wetlands have played the tertiary role of retention of sediment from runoff, tertiary treatment of nutrients and sewage, and the 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 mean that the majority of the Ugandan population lives within walking distance of a wetland edge, and many interface with wetlands on a daily basis (Bakema and Iyango 2000), and Kirinya wetland is no exception; it is surrounded by a community that depends on it for farming, fishing, water and raw materials.

The main value obtained from wetlands, as conceived by many, is the consumption and use of goods, such as water, fish, firewood, building materials, agricultural products, medicine, and pasture (Luwumu and Acuba 1998; Bakema and Iyango 2000). A review of the National Wetland Policy Project activities indicates that immediate economic benefits were the major contribution of wetlands to the communities (Luwumu and Acuba 1998). However, gender relations in the utilisation of the wetlands were not clearly understood, and it was not possible to establish who was doing what or who was benefiting, as far as gender was concerned. Women, men and the youth use wetlands differently, and they attach 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, and only limited domestic activities (Sass 2002; Flintan 2003).

A number of training and awareness programmes had been carried out by the Wetland Inspection Division—formerly known as the National Wetland Programme—but little of this training was gender sensitive. Lately, policy makers, after realising the different roles played by women and men in natural resource utilisation and management, have been giving gender issues serious consideration. The Wetland Inspection Division is reviewing the national policy for the conservation and management of wetland resources (adopted in 1995), with a view to including gender relations.

Degradation of Wetlands in Uganda

In this study, degradation refers to the destruction of a potentially renewable resource, such as a wetland, by consuming it at a rate faster than it is naturally renewable, so that, if such use continues, the resource becomes non-renewable or non-existent. 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 in developing countries and the resulting degradation have been the result of survival strategies of the poor, who are often unemployed. In Jinja, wetland encroachment is becoming increasingly significant, due to the high rate of urbanisation, accompanied by a 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, and this has led to the closure of a number of industries, with recreation centres established in their place. As a result, many people who were working in industry 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—Rwanda, Burundi, Sudan and the Democratic Republic of Congo—forcing 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 receives 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 times fold in the last ten years or so (Jinja District Profile 2003), exacerbating the situation. As a result of the serious contamination of the wetland, resource users in the area face serious health risks, including exposure to heavy metal contaminants, pesticides and radioisotopes.

It is generally believed that the poor are the main source of wetlands pollution and of their (the poor wetlands') subsequent degradation. However, over time, many studies have revealed that wealthier groups or individuals who control and use these areas are also responsible for the degradation of wetlands. For example, it has been reported in Ethiopia that it is the 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 safeguard these habitats against destructive activities, so

that they can continue to serve their ecological functions (NEAP 1990). However, at the time of this study 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, drainage of wetlands for agricultural purposes, excavation in the form of sand, mining and the extraction of clay for brick-making, deforestation of swamp forests and rampant swamp fires. Although it is recognised that wetlands are important in the tertiary treatment of sewage and the retention and extraction of industrial and toxic waste in urban areas, efforts to conserve them have been inadequate.

Access to, and Management and Conservation of Wetlands in Uganda

The Ugandan wetlands are held in trust for the people of Uganda and are constitutionally protected and reserved for the common good of all citizens. There exists a clear set of laws and regulations governing the use of wetlands. Every Ugandan citizen is free to access the wetland resources as long as the people's activities are held within the limits stipulated by the local authority.

Uganda adopted a policy of decentralisation with the aim of creating a democratic, participatory, efficient and development-oriented local government system. The decentralisation programme seeks to transfer political, administrative, financial and planning authority from central government to local government councils (RoU 1993). The decentralisation of decision-making powers over natural resources to publicly accountable authorities is frequently advocated as a means of achieving social development and enhancing NRM. This implies that local governments can make by-laws 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, though always within the context of national policies and guidelines.

Within the local council structures, there are elected representatives at all levels, who serve as secretaries in charge of production and environment. These are the contact persons representing the community on wetland and environment issues. They organise public meetings to educate and mobilise residents on proper environmental management, such as good sanitation, good farming practices, tree planting and the proper use of wetlands. They also collect and disseminate information on the environment; link communities with extension staff, NGOs and community-based organisations (CBOs), and other support agencies; act as overseers and inform relevant authorities on activities that may be destructive to the environment or the well-being of the community, and enforce government laws and by-laws to ensure that members of the community abide by such laws (NES 1995; NEMA 1996).

A comprehensive analysis of the decentralisation reform from an environmental perspective indicates three major problem areas (Bazaara 2003). Firstly, there is no effective or consistent decentralisation of powers relevant to natural resource management. Secondly, local governments have failed to exercise the limited powers they do have, since control over the necessary financial and human resources has remained centralised. Lastly, when local governments have 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 utilisation at the local level.

Wetland conservation in Uganda was first recognised important 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 International Union for Conservation of Nature (IUCN), to assist the government to develop policy and seek alternatives to unsuitable use of wetlands.

In 1994, the Ugandan government adopted a National Wetland Policy, which described in broad terms how the government intended to deal with the country'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 for what may and may not be done in wetlands. The NES was further operationalised through the National Environment Regulations of 2000 (which refers to wetlands, river banks, and lake shores management). In addition to the NES, other laws – such as the Local Government Act and the Land Act – reinforced and gave further detail regarding specific aspects of wetland management. Reference to wetland ownership, protection and conservation are also contained in the Ugandan constitution. The NES established the National Environment Management Authority (NEMA), to supervise, monitor and coordinate 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 of the Ministry of Water, Lands and Environment. The Wetlands Inspection Division assisted central and local governments to develop and apply a long-term policy for the conservation and management of wetland resources, and to acquire the necessary capacity (skills and finances) for the implementation of this policy.

The Local Government Statute of 1993 assigned to districts the management of their local wetlands. District officers are charged with the responsibility of upholding wetland laws and regulations. District and local council officers are expected to curb wetland abuses, and thereby contribute to the overall goal of using Uganda's wetland resources in a sustainable manner. It is hence apparent that, at policy level, wetland utilisation issues are addressed amply.

Objectives of the Study

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

The specific objectives of the study included (i) determining wetland resource utilisation by men, women, boys, and girls within the communities living around this wetland, and the benefits attached to these uses; (ii) investigating activities carried out by men, women, boys and girls that might lead to wetland resource degradation through pollution with selected contaminants; (iii) investigating wetland resource utilisation by men, women, boys and girls that might lead to risk of exposure to the selected contaminants, and assessing their knowledge of such risks; and (iv) establishing mechanisms for access to and control over wetland resources and encouraging 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, which is part of Jinja Municipality. This wetland was considered to be polluted with contaminants from various activities carried out within the wetlands or in their catchment areas. Industrial and sewage effluent from Jinja Municipality also flows into this wetland before it drains into Lake Victoria.

The study focused on gender analysis of activities associated with wetlands, and the risks of 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, and their level of awareness of potential risks, and to get information about the activities they carry out in the wetland and the consequent benefits they receive. These results were incorporated into the outcomes of the laboratory study (VicRes Project).

The unit sample on which the study was based was stratified along economic activities carried out by women and men utilising

the wetland, and that enabled a uniform selection of respondents. Altogether, 75 men, 75 women, 7 boys and 1 girl, that is a total of 158 people were interviewed during the study.

The questionnaires were divided into sections following the four study objectives. Focus-group discussions (FGDs) were conducted with about 8 to 10 people, with representation from different categories of people utilising the wetland: women and men, farmers and fishers, and with women and men alone. The FGDs were carried out after a thorough analysis of responses from individual wetland resource users. This helped to complement and strengthen the findings from the structured questionnaires. Interviews with key informants were carried out using semi-structured interview guides. Key informants included Jinja Municipal Council Environmental Officer, the Division Environmental Assistant and an official from the Jinja Urban Women Wetland Organization (JUWVO).

Data were analysed using the SPSS statistical computer package, and descriptive statistics were used for the display of the data summaries. To establish the existence of any relationships between variables, a chi-square test was conducted. With respect to categorical data, the observations were summarised 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 utilising Kirinya wetland included a gender disaggregation of the key users, their levels of education, marital status and age brackets. The main individuals utilising Kirinya wetland were men and women, with very few boys and girls. This was evident during the study as 75 men, 75 women, 7 boys and only 1 girl were encountered and interviewed during data collection. For this reason, the study concentrated on men and women for further analysis. There were more men than women in the age bracket 19 to 40 years, and more women in the age bracket of 40 years and above.

The education levels among these wetland users were categorised into those who had attended no education, those who had attended primary, those who had attended secondary, those who had attended tertiary and those who had attended university level education. A significant relationship was observed between educational level and gender categories ($\chi^2 = 14.259$, $df = 4$, $p < 0.05$). Amongst those who had not attained any form of education (no schooling), the majority (81.5 per cent) were women. The majority of the interviewees had attained primary followed by secondary education, with more men than women in each category (58.4 per cent and 60.5 per cent, respectively).

With regard to their marital status the respondents were categorised into five: 1) married, 2) single, 3) divorced, 4) separated, and 5) widowed, and there was a significant relationship between marital status and gender categories ($\chi^2 = 11.584$, $df = 4$, $p < 0.05$). The majority of the respondents, 72 per cent, were married out of which 54.6 per cent were men and 45.4 per cent were women. Of the respondents who were not married, there were more women than men: women constituted 66.7 per cent of the separated (55.1 per cent of the divorced and 100 per cent of the widowed respondents.▪

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 livestock grazing. A significant relationship was observed between these activities and gender categories ($\chi^2 = 14.568$, $df = 17$, $p < 0.05$), with 86.7 per cent of the total practising farming. Amongst the gender categories, 89.3 per cent of the women and 84.0 per cent of the men practised crop farming. The few boys interviewed were using the wetland to catch bait (worms) for fishing, and the single girl for crop farming. Crops farmed included vegetables, such as carrots, tomatoes, cabbage and eggplant, food crops like sweet potatoes, cassava and yams, cereals like maize and rice, fruits like pawpaw and mangoes, and sugarcane.

Benefits attained from Kirinya wetland by the individual users were identified and included income, food, and both income and food. Although no significant relationship ($p = 0.05$) was observed between these benefits and the gender categories, there were more men (54.1 per cent) utilising the wetland for income alone than those utilising the wetland for both income and food (53.3 per cent). More women (62.2 per cent) than men utilised the wetland for food alone. The main benefits from the wetland for the boys were income, followed by food.

Users' Awareness of Chemical Contaminant Degrading of Kirinya Wetland.

There was a significant relationship ($\chi^2 = 7.796$, $df = 1$, $p < 0.05$) between the gender categories and the level of awareness of activities carried out in Kirinya wetland that led to all sorts of wetland degradation. Of those who were aware, 56.8 per cent were men and 43.2 per cent were women. When it came to specific chemical pollutants, more men than women were aware of the situation, but the difference was not significant.

Respondents who were aware of the status of the wetland mentioned bush burning, excessive crop farming, excessive papyrus cutting, digging trenches, growing rice, distilling local brew, livestock grazing, effluents from factories, crop spraying, 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 those activities and three contaminants were mentioned, namely 1) chemicals, 2) germs, and 3) dirty/smelly water. According to 64 per cent of the men, the main contaminants getting into the wetland were chemicals, while according to 63 per cent of the women, the main contaminants were germs.

Knowledge of Risks from Chemical and Biological Contaminants

There were slightly more respondents (54 per cent of the total) familiar with the wetland activities that led to exposure to contaminants than

those who were not aware. 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 per cent were men. Amongst women, 54.7 per cent were unaware of the activities that led to exposure to contaminants.

The reported activities that were presumed to lead to exposure to contaminants included cultivation, collecting bait for fishing, fishing, harvesting papyrus, and swimming. Amongst these activities, 65.4 per cent of the total respondents mentioned cultivation as the main activity carried out in Kirinya wetland that might expose individuals to chemical contaminants, and the response was given by 68.1 per cent of the men respondents and 61.8 per cent of the women respondents. The contaminants mentioned as health risks to wetland resource users included – from the most frequently mentioned to the least frequently mentioned – germs, chemicals, sharp objects and smelly/dirty environment.

In addition to chemical contaminants, also biological contaminants 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 could increase the chance of individuals coming into contact with chemicals, parasites or bacteria. Based on field observations and community inputs, six risk factors for potential exposure to chemical and biological contaminants were identified. These included water contact practices, proximity of gardens to chemically or biologically contaminated sites, close proximity of residential areas to chemically contaminated sites or infectious insect breeding sites, lack of access to safe drinking water and sanitation facilities, filthy homesteads, and overcrowding in homesteads.

Access to and Control of Wetland Resources

The use of wetland resources in Uganda is governed by by-laws; as a result potential users need to get permission for access to wetlands.

Most respondents, and more women than men, sought permission to use Kirinya wetland from authorities, despite the fact that relatively more men than women knew about the by-laws that governed the use of wetland resources. Furthermore, group discussions and observations in the field revealed that many of the men did not abide by these laws: many of them dug trenches and grew crops, such as rice that required a lot of water—two activities strictly and specifically forbidden by the regulations. Women, on the other hand, followed the rules more carefully.

Efforts towards Sustainable Management and Conservation of the Wetland

Both individual and group efforts towards a sustainable management of Kirinya wetland have been made. Individual efforts have entailed abiding by by-laws. These involved the users leaving a buffer zone of a hundred metres from their gardens to the edge of the wetland where papyrus grew. Other individual steps were the proper use of the wetland, provision of advice to other users, not digging trenches and avoiding bush burning. Group efforts towards sustainable management involved organisation into groups, and women, through JUWVO, played a far larger role in this regard than men did. JUWVO was responsible for the planning, monitoring and regulation of users, since the local users are the custodians of the wetland. To ensure conformity to existing regulations and by-laws, the organisation reported to the Environment Department at the Jinja Municipal Council. Other group efforts were carried out through sensitisation by the Lake Victoria Environmental Management Project, and through local councils.

The main suggestions given by the individual users towards sustainable management of Kirinya wetland revolved around law enforcement. These included continuous sensitisation of wetland users regarding laws, continuous enforcement of laws, avoiding bush burning, cultivating wetland-friendly plants, avoiding the use of pesticides in wetlands, not digging trenches, practising crop rotation, observing the 100 metre buffer zone from papyrus stands, not growing rice in the wetland, and stopping excessive papyrus cutting. Of these

proposals, continuous sensitisation of wetland users regarding laws was the most frequently mentioned suggestion by 56.9 per cent of women and 60.7 per cent of men respondents. Women mentioned, in addition, using alternative sources of income as an 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 who utilised Kirinya wetland in various ways. Field observations and results of 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 a village lifestyle. Instead, they preferred getting casual jobs in factories and retail shops in town. The other reason given was that the majority of the youth go to school – attributed to the universal (free) primary education – and hence could not be engaged in wetland resource exploitation on a regular basis. The data collection exercise was conducted during school term so the youth and students who might otherwise have been utilising the wetland were away in school and were not included in the study. For these reasons, it was mainly men and women, who were directly utilising Kirinya wetland at the time the research, that were respondents for the study.

It was found that the majority of the women and men utilising Kirinya wetland were of low socio-economic status, being neither skilled nor educated. Such low-skilled people stand little chance of finding employment in enterprises that require skills or education. It was therefore not surprising that these people relied on wetland resources for survival. This agrees with the findings of Flintan (2003) who suggested that both women and men in Africa and Asia, and particularly those from poorer households, could 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 much

lower than that of men. This also agrees with Flintan's (2003) findings that women have less access to education and health care and fewer economic opportunities.

In Uganda, women's lack of access to education could be attributed to previous absence of universal primary education. In addition, because of the deep-rooted cultural and traditional gender roles, many parents in those days preferred sending only their sons to school, as well as marrying off their daughters at an early age.

The majority of the wetland users fell within the age bracket 19 to 39 years, with more men than women in this category. Many of them were not educated, and they resorted to the wetland resource for survival in terms of income for management of the household, as well as payment of school fees for their children and food for home consumption. In the age category of 40 years and above, it was found that more women than men utilise the wetland resource. This implied that as the women aged, they increasingly used natural resources for survival. Some of these women had retired, and many of them had lost their jobs in factories, and therefore resorted to utilising the wetland for survival.

Activities Carried Out in Kirinya Wetland 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 the observations of Luwumu and Acuba (1998) 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 could not be classified as rural, they were dependent on wetland resources, most likely because of their low socio-economic status, which could be a result of their low educational standing.

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

The majority of women and men farmed for both food and income, which implies that both women and men rely on the wetland not only for food security, but also to trade in wetland products to supplement their household incomes. This was again in agreement with the findings of Flintan (2003), who found that though it was primarily men who were involved in commercial enterprises, women also sold and traded in natural resources.

The fact that more women than men practised crop farming could be attributed to women's retrenchment following the closure of some factories in Jinja. The women resorted to farming in the wetland, while the men either went to the villages or moved to other places in search of employment. Further, most women had very little education compared to men and thus stood little chance of employment elsewhere. It was also noted through field observations and FGDs that, even though there were more women farmers than men, individually women had smaller gardens than individual men farmers had. It is possible that the total combined farm area of men was larger than the total combined farm area of women.

Awareness of Chemical and Biological Degrading of Kirinya Wetland

Neither women nor men who used Kirinya wetland were aware of environmental degradation of the wetland with chemical contaminants. 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, such as bush burning, excessive crop farming, excessive cutting of papyrus, digging trenches, growing rice, distilling local brew, and livestock grazing— effects of which they could see and appreciate physically.. Degradations by effluents from factories and crop spraying that could lead to chemical contamination of this particular wetland were at the tail end of the listing.

Compared to men, women were generally less aware of activities that led to wetland degradation and also of activities that involve use

of or yield by-product chemicals that led to wetland degradation. This could be attributed to women's lack of sensitisation as compared to men who can find time to attend meetings and other activities other than their regular engagements, while women often are tied up with daily domestic chores (Francis and Jahn 2001; Flintan 2003). Also, women's lower level of education might have contributed to their low awareness.

More men than women showed awareness that spraying crops grown within the wetland could lead to contamination of Kirinya wetland, while more women than men mentioned disposal of faecal matter as one of the major contaminants, more so than chemicals. This could imply that women were less aware of chemical contamination and thus could not consider harmful the presence of such contaminants in the environment. Women were more aware of the presence of biological contamination than of chemical contamination, and more so than men. It seems women generally have a higher sensitivity than men to odour and pay more attention to environmental hygiene than men do (Francis and Jahn 2001).

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

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, Mnali and Agaki 1998). Some of these contaminants enter the food-web and some get deposited as sediment (Laws 1981; Ikingura and Mutakyahwa 1997). However, most complaints by the wetland users were about Uganda Leather and Tanning Industry (ULATI) – mainly because of the pungent smell associated with leather processing, not on account of dangerous chemical pollutants.

The 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 degreasing 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 (JRB Associates 1982). **Tannery effluent** also contains large amounts of other pollutants, such as proteins, hair, and salt.

Also the steel rolling industry is a major source of chemical pollution of the wetland. The production of steel causes water, air and noise pollution, and generates hazardous waste. Other institutional users discharging their waste water into the wetland included fish factories, oil depots and various smaller industries located outside the wetland. The National Water and Sewerage Corporation, through leakage of pipes carrying municipal and industrial effluents, and through overflow of effluent during rains, could contaminate the wetland environment with both chemicals and bacterial loads.

Knowledge of Risks from Chemical and Biological Contaminants

Overall, results from this study indicated that there was a lack of awareness of chemical pollution in the environment and a resulting lack of awareness of the risks associated with it. Biological contamination was noted more than chemical contamination. It is important to note that chemical elements have a wide range of industrial applications and can thus provide huge benefits, but they can 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, and have other significant effects (Laws 1981). Pollution also has 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 livelihoods.

Both women and men are at risk of exposure to chemical and biological contaminants through water contact. For example, women

members of JUWVO were contracted by Jinja Municipal Council to maintain a drainage channel (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 drain, as well as rice growers and fishermen who work in a wet environment in this wetland on a daily basis were at a high risk of exposure to chemical and biological contaminants.

The National Water and Sewerage Corporation (NWSC) uses a series of ponds for the natural stripping of toxins from domestic and industrial effluents before discharging the effluent into Lake Victoria. There are gardens and homesteads in close proximity to NWSC treatments ponds. When it rains, the ponds fill up and the overflow drains into the nearby gardens, polluting these domestic sites with chemical and biological contaminants. Thus, also cultivators of crops other than rice may be exposed to contaminants through contact with a wet environment, particularly during the rainy seasons. Also fish factories are likely to induce biological contaminants into the environment through the discharge of their effluent.

The close proximity of residential areas to contaminated sites and/or infectious insect breeding sites puts women and children at greater risk of exposure to chemical and biological contaminants, since they (women) spend more time working in the field or at home than men do. Given their reproductive roles, women are less mobile and tend to be more active around the household. Pregnant women and children are especially vulnerable to chemicals and infectious insect bites, because of their weakened or underdeveloped immune systems (UNICEF 1998), and are classified as risk groups by the World Health Organization (WHO). These groups, i.e. pregnant women and children, are exposed to chemical effects through direct contact with contaminants in the environment and to biological contaminants through insect bites, which could be frequent because of proximity.

Lack of access to safe drinking water and sanitation facilities was a risk factor to both gender groups and also to the children age group. However, women and children, who stay at home throughout the day, were more at risk of exposure to chemical and biological contaminants through direct contacts and insect bites. The reality that it is the women who are responsible for fetching water and keeping the homesteads clean increases their being exposed to the contaminants. In a bid to provide safe drinking water and a clean environment for their families, women must sometimes engage in collecting scarce resources, such as water from alternative sites, which renders them 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 can cause homesteads and the surrounding environment to become unsanitary. Women were particularly affected by contaminated homesteads because they were the ones responsible for household sanitation and waste disposal.

In a bid to maintain hygiene and provide the family with clean water, the workload of women and girls is increased. Francis and Jahn (2001) argue that increasing the workload of women and girls places severe stress on their health and their capacity to take advantage of education and training opportunities. This could explain why women respondents 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

The study revealed that the implementers of the law were mainly men, with a marginal female presence. Despite the existence of national gender and wetland policies in Uganda dealing with gender equality in access to and control over of natural resources, there were no indications, at the time of the study, that these policies had been implemented. Gender inequalities in access to and control of wetland resources continued to exist in the study area. For example, the LCI administrative structure — of primary interest to this study — focused on

wetland resource users at village level. This local council was comprised of ten members. The Municipal Environment Officer and seven of the members of LCI were men. Since only three women were directly involved in administration, the management was not gender-balanced, and was dominated by men. The overall administrative powers also lay with men.

Every Ugandan citizen is free to access the wetland resources as long as she or he keeps to the access procedure stipulated by the local authority. Wetlands are held in trust by the government for the people of Uganda and are constitutionally protected and reserved for the common good of all citizens. All users are thus required to lease plots from government. Government has instituted a clear set of laws and regulations that govern the use of wetland resources, involving transfer of authority from the centre to local government councils entrusted with ensuring sustainable use through the enactment of by-laws and the application of regulatory procedures. In the past, use of Kirinya wetland and all other wetlands in Uganda was on a first-come-first-served basis, but from 1997 the urban wetlands in Jinja have been controlled and managed by the JMC, in collaboration with the respective custodians (the appointment of custodians is explained latter in this chapter).

The study revealed that most users initially accessed the wetland resource through colleagues or neighbours already utilising the resource. The custodian then requests them to register through the proper channels afore-described. However, as has already been mentioned, more women than men sought permission to use the wetland resource from the appropriate authorities. This was because women, in addition to respecting the law, also respected the management team, while many men were disrespectful of the management, because the team managing the wetland and the custodian of the wetland were all women.

It was noted that Jinja was the only district in Uganda that has locally instituted by-laws for the management of wetlands. These are known as the Jinja (Wetland Resources Management) by-laws 2000, and were formulated jointly by the various stakeholders. These stakeholders included representatives from the JMC, the Wetland Head Office, the

Fisheries Resources Research Institute (FIRRI), and local users. The objectives of the by-laws are to facilitate and permit sustainable use of the wetlands. The by-laws are implemented by a wetland custodian, appointed by the municipal council from among the existing users of the wetland for a period of five years (the appointment is renewable 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, JUWWO has been the wetland custodian, entrusted with this task because of their efforts to ensure sustainable use of the Jinja district wetlands, and because of their active participation in the process of formulating the by-laws.

JUWWO was a product of the partnership between the JMC and 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 sensitise the people, a partnership was formed between the researchers (FIRRI) and the municipal administrators (JMC).

Management and Conservation of Kirinya Wetland at Individual and Group Level

Results of this study regarding wetland conservation revealed a clear distinction between men's and women's efforts towards sustainable wetland management, with women typically displaying higher levels of concern about land degradation, and more behavioural adjustment to incorporate obeying laws, both new and old, than men. These findings were in agreement with those of Hunter, Hatch and Johnson (2004), who, during their review of 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.

It was noted that men were good at memorising the laws, and, when asked about individual efforts towards sustainable management of the wetland, they were quick to state the by-laws, but field observations and

focus-group discussions revealed that more women than men actually adopted conservation practices at individual level.

At group level, women took a leading role in Kirinya wetland conservation, through JUWWO. This agreed with the work of Flintan (2003), who mentions that women tended to be more willing than men to form cooperatives and self-mobilise 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 custodian responsibility for Jinja urban wetlands. However, JUWWO faced many challenges, especially from men, who had no respect for it as an organisation and frequently refused to abide by the regulations governing wetland resources.

Again, this agreed with the findings of Flintan (2003), who states 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 recognised and utilised.” JUWWO, as a women organisation, is facing the same challenges. Flintan (2003) further suggests that men may resist women’s participation in conservation and development because they feel threatened—being concerned that women’s domestic roles and responsibilities may be neglected if women take part in extra-household activities.

Conclusions and recommendations

Conclusions

Gender and environmental awareness was found to be lacking among the groups studied, including even wetland and environment management officials. Likewise, awareness of chemical contamination in the environment was found lacking among the men and women utilising the wetland resource. The people were thus not aware of the risks and effects of their exposure to chemical contaminants. In addition, the level of awareness among women about wetland degradation

in general, and degradation caused by chemical contaminants in particular, was lower than the level of awareness of men.

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

As far as pollution of the environment by chemicals was concerned, inputs due to individual activities of males or females were minimal. Instead it was the activities of institutional users that were more polluting the wetland with chemicals. These users included industries and factories as well as fuel depots located within the wetland. It was, however, the urban poor who utilised the wetland resources and who were thus exposed to a range of environmental pollutants, such as industrial wastes, toxic chemicals, and air pollution, as well as 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 female presence. There had been efforts to control wetland use for sustainability, and the women had taken the lead in this aspect, both at individual level through obeying the by-laws and at group level through JUWVO.

Recommendations

This research found a need to create gender and environmental awareness among the wetland and environmental management officials, among men and women users, and among the institutional users of Kirinya wetland. Such awareness would ensure gender equity in access to, control over and conservation of the wetland resource. The research suggests that men and women users of Kirinya wetland be educated about chemical contaminants and their effects. Accordingly, environmental monitoring packages should be included in the strategic plan to ensure sustainable utilisation.

There is need for behavioural changes and commitment among both men and women users of Kirinya wetland, and these changes should lead to an increased involvement of youth (girls and boys) in wetland management practices, to improved identification of environmental degraders and subsequently to their being reported to the respective authorities, and to adoption of proper sanitation and hygiene practices.

There is a need for thorough assessments of the institutional use of wetlands, since institutional users were identified as the main chemical degraders of the wetland. Industries and factories should be pressed hard to comply with existing environmental regulations, and legal action should be taken against environmental polluters. Efforts should be made to ensure proper disposal of effluent.

A thorough assessment and inventory of the chemical composition of the different effluents being discharged into the wetland is necessary. Further studies are needed to explore risk factors and identify relative risks of exposure to contaminants. Future studies should, in addition, consider surrounding communities that utilise the Kirinya wetland.

Formulation of a comprehensive management plan for the wetland is deemed necessary, and this should include a list of legal investments not permitted to be established within the Kirinya wetland. The Wetland Inspection Division should provide technical and financial support to JUWVO, to develop the management plan.

Alternative sources of income need to be identified and investments made to benefit low income earners, and discourage them from encroaching on the wetland. This study recommends that Jinja municipal officials follow up on the Poverty Alleviation Fund allocation for environmental management, and investigate alternative sources of funding to facilitate municipal wetland conservation programmes.

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6

Gender Issues in Fish Farming in the Lake Victoria Basin: with a Focus on Development and Dissemination of Wetland *Clariid* Fishes Breeding Technologies

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

Background

This research complemented an ongoing project entitled *Development and dissemination of appropriate breeding technologies for wetland clariid fishes in the Lake Victoria basin, East Africa*. This project addressed important technological gaps in the development and dissemination of breeding technologies of *clariid* fishes. It did not, however, address social and gender relations and linkages in the community with access to resources in the development and dissemination of these technologies.

Lately, the need to understand farmers' interests and aspirations, as well as those of the local community, has taken centre stage in agricultural project formulation, implementation and monitoring. Such knowledge could be gained only by examining the socio-cultural environment of rural communities and by understanding how members of these communities derive their livelihoods. This entails analysing farm labour, household dynamics in decision-making, policies, and gender auditing, and generally viewing rural development through a

gender lens (Akello and Sarr 1999). Literature reports gender disparities in value-for-labour income, access to and control over resources in many communities in Uganda (FAO 1999; Akello and Sarr 1999). This is an impediment to socio-economic development and the improvement of livelihoods, since it denies women – who are half of the population – essential means of production.

Traditional inequities among communities relating to gender relations need to be fully understood, so that technology recipients could become the real, not merely the perceived, users. The study therefore aimed at investigating the situation pertaining to aquaculture in general and the utilisation of wetland fishes in particular, and to generate information and propose methods for the integration of gender issues into fish farming in the Lake Victoria basin.

Objectives and Study Framework

Objectives

The overall objective of the study 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 included: (i) collecting gender disaggregated data on aquaculture production and utilisation in the Lake Victoria basin; (ii) ascertaining modes of decision-making regarding, access to and control over, and benefits from aquaculture among local riparian communities (people living along lake or river banks); and (iii) developing socially acceptable and gender-sensitive approaches for the development, training, and transfer of clariid fish farming 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 United States Aid for International Development (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, consideration was given to social differences too—such as age, marital status, occupation, and education level—which might influence access to and utilisation of resources. The study aimed to collect disaggregated data on the utilisation of cultured fishes, and to incorporate social issues in the proposed dissemination of breeding technologies to the actual users and ultimate beneficiaries within the community for sustainability. A conceptual model of the study is outlined in Figure 6.1.

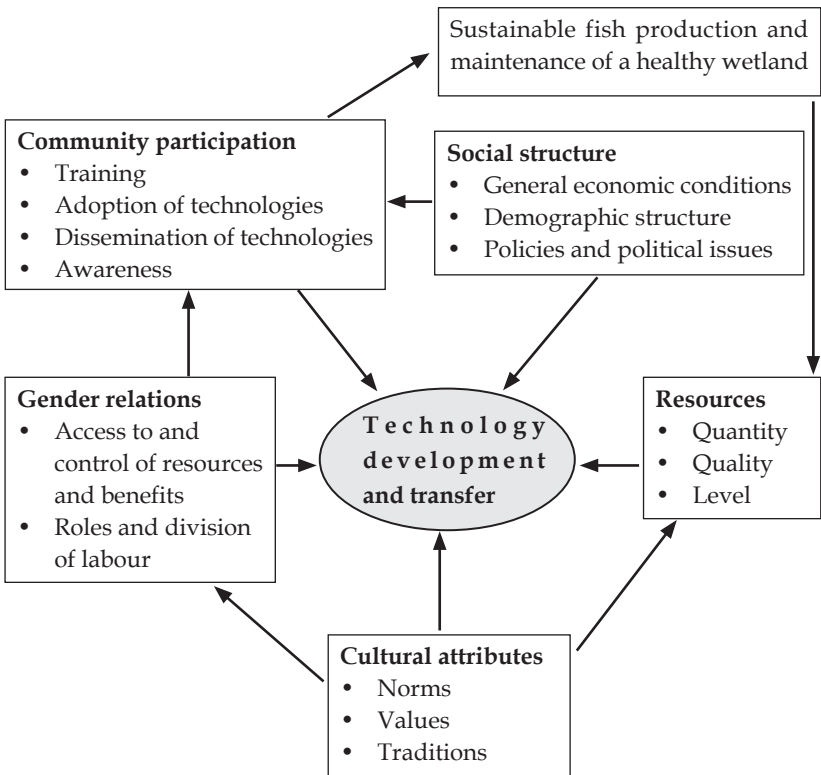


Figure 6.1. Conceptual and theoretical framework

Methodology

Research Design and Sampling

The study area consisted of three districts in the central part of Uganda, namely Kampala, Mukono and Wakiso. In the data collection, emphasis was placed on methods through which gender might be integrated in aquaculture, particularly fish, production and utilisation through the use of various qualitative and quantitative techniques. The study also assessed the accessibility of resources required for the production of cultured fishes in the community. The modes of decision-making and control over the benefits from aquaculture were analysed. An attempt was also made to establish ways through which socially acceptable and gender-sensitive approaches to training and technology transfer could be developed.

A cross-sectional study approach was employed, with sixty respondents, drawn from sampling frames obtained from local government fisheries officers, each district contributing twenty respondents. An effort was made to ensure that the sample consisted of respondents from all genders. 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, considering the diversity of the coverage of the area and the large number of farmers involved in aquaculture activity. Snowball sampling was also used in particular areas, for instance where the farmer was absent for some reason, or was inaccessible due to inaccuracy of the lists, or had moved from the area or had abandoned the activity in the last three years or less. This sampling design was selected because it would involve a broad sampling of persons who differed in age, income, and education. The advantage is its ability to obtain a variety of information from different groups of people (Bailey 1994).

The primary sources of data were fish farmers practising aquaculture, as well as those who had abandoned this means of earning a livelihood in the previous three years or more. Since the farmers

were 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 (in Uganda), the study aimed at achieving a good understanding of social issues by means of qualitative and descriptive data. Some of the tools used were semi-structured, which ensured that the opinions of the individual farmers were captured, in addition to what was said in the focus group discussions.

Many 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, supplemented by other methods, including questionnaires. Fish farmers were the primary sources of information, complemented by fisheries officers, government reports, media reports and other literature on aquaculture.

This was an interactive project between the community and the researchers, so there was a need for openness and patience, and a clear understanding of the social environment. Rapport was established by the 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, and community participation permitted a better technology fit with the fish farming systems. Built within this approach was flexibility to adjust technology to user needs.

Triangulation was employed to enhance reliability of data and improve the accuracy of findings via the use of multiple and different sources, methods, investigators or theories (Denzin 1988 cited in Leahey 2007; Wilde 2001). It was also 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 researchers' 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 fish biologists, aquaculture practitioners, educators, 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, and, wherever necessary, rearranged according to the appropriate part of the thematic framework to which they related. The data were also organised in the form of themes sought, with a view to providing explanations for the findings. Computer software SPSS VERSION 10.0 was used to analyse the qualitative data.

Findings

Characteristics of Sample Population

The total number of respondents was 60, however only 52 people made up the sample population; and 72.5 per cent of them were men, and the rest 27.5 per cent were women. The sampled fish farmers had an average age of just under 50 years, with the men having a mean age of just over 50, and the women of about 45. This difference in age between the two gender categories was, however, of no statistical significance.

The majority of the fish farmers were educated. Primary schooling was free, and many of the respondents had gone on to attain Ordinary Level (O Level) school education, though a significant number of them ($\chi^2 = 10.113$, $df = 4$, $p = 0.039$) had dropped out and did not complete their secondary schooling. This was attributed mainly to inability to pay school fees, especially for girls.

Educating females was considered by many to be a waste of resources. The famous Indian saying that 'educating a woman is like watering a flower plant in another man's compound' was believed by people in this area too. The proportion of female fish farmers decreased with increasing educational level. For instance, of all the respondents who had attained university education, only 7.7 per cent were women, and this has impacted greatly on aquaculture practitioners as a whole, and women in particular (UNIFEM 1993).

Marital Status, Household, Composition and Occupation

In the present study, 76.6 per cent of the respondents were married (with a high significance: $\chi^2 = 42.706$, $df = 2$, $p < 0.001$). Half the women were married, and the rest were either single or widowed, with a high proportion (41.7 per cent) being widows. A low level of significance ($\chi^2 = 12.845$, $df = 2$, $p = 0.002$) was observed between marital status and gender of fish farmers. Two-thirds of those who were not married were men. It was further observed that 83.3 per cent of the total number of widowed respondents was women.

It was reported that 78.0 per cent of fish farmers head their households ($\chi^2 = 15.680$, $df = 1$, $p = 0.001$). Of these, 81.6 per cent were men. The mean household size was nine, with the number of people per household ranging from 4 to 23. Male-headed households were slightly larger than female-headed ones, but this difference was not statistically significant.

A significant difference was observed between adults and children below 18 years of age ($t = 2.528$, $df = 44$, $p = 0.015$) engaged in fish farming. Children, who made up over 60 per cent of the household, had a low contribution to fish farming. A significantly high number of fish farmers ($\chi^2 = 75.585$, $df = 7$, $p < 0.001$) were found to be full-time farmers, with 51 per cent engaged in agriculture 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 (51.0

per cent), civil servants (15.7 per cent), businessmen and women (11.8 per cent), housewives (5.9 per cent), fisheries officers (2.0 per cent), nuns (2.0 per cent) and others (7.8 per cent). When respondents were arranged by gender category within occupation, over 60 per cent of the fish farmers who engaged in agriculture as a major activity were men.

Fish Farming and Production

Fish farming was being taken up as a major activity to improve household income and provide employment, and this was corroborated by the findings of this study. About 50 per cent of those involved in fish farming considered it to be an important enterprise. It was, however, a relatively new activity in the study area. Fish farmers had been practising, on average, for about four years. No significant difference was observed between men and women with regard to how long they had been involved in fish farming in the area. This implied that the activity had been equally embraced by men and women; despite the fact that relatively more male-headed households were involved in fish production (76.5 per cent). Other findings have also revealed that fish production lay in the male domain, but that it relied on the full participation of women and the family to function normally (Goetz 1978 cited in Madanda 2003). Lack of access to production resources and other necessary requirements, such as information on production methods 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 (71.2 per cent; $\chi^2 = 9.308$, $df = 1$, $p = 0.002$), predominantly men, reported that they had 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 per cent) did not get any extension services from the National Agricultural Advisory Services, and those who did receive such services claimed that the information did not include fisheries advice. It was primarily men who received such information, with 71.4 per cent of those receiving such information being male. Likewise, more men (78.6

per cent) reported having received extension services. Information on fish production was obtained from various sources with the key sources being government and district fisheries officers, development partners, such as NGOs, farmers groups, and friends.

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

Utilisation of Fish

Aquaculture development in most of African countries has primarily 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 findings of this study, where the majority of farmers carried out fish culture activities to fulfil 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.

The majority of the farmers, both men and women, were motivated to begin fish farming to increase household income and food security, and to circumvent the limited availability of resources, such as land. The need to increase household income ranked the highest among the motives for carrying out fish farming in both gender categories – 59.5 per cent of the men and 38.5 per cent of the women respondents. In the study locality, both males and females were culturally permitted to consume fish; there was no gender-related impediment to eating fish.

Control over Proceeds

Many (65.4 per cent) of the fish farmers interviewed in this study 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 per cent) decided 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 the 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).

The trend in many rural communities was that farmers preferred selling off or hiring out the wetland to growers of swamp crops, such as rice and yams. It was found that, of those claiming to have adopted fish farming as a means to make the wetland more productive, two thirds were men.

Types of Inputs Needed by Fish Farmers

Aquaculture is essentially an agricultural activity, competing with other agricultural enterprises for the same basic inputs – land, water, labour, and nutrients – and forming part of the farm resource cycle (FAO 2003).

Of the desired farm inputs listed by fish farmers, labour, feeds, farm implements and capital were the needs most frequently mentioned. Men cited feed as the most important need, and more women (58.3 per cent) than men (54.3 per cent) considered labour the most-needed fish-farm input. No-one rated farm implements, capital or fish seed as a high-ranking need.

On the whole, farm sizes were small, varying from 0.276 hectares to 0.653 hectares for men and 0.152 hectares to 0.155 hectares 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. This study indicated that more women than men faced resource constraints, a probable reason why women spent less on aquaculture inputs than men did.

Land

Land Utilisation

Findings from this study revealed that swamps that had previously been regarded as idle and unproductive land had been put to good use by farmers. Prior to introduction of fish farming, many of these swampy lands had been underutilised. A high proportion (76 per cent) of the respondents owned the land they were using for fish farming (statistically significant, with $\chi^2 = 11.077$, $df = 1$, $p = 0.001$). Land ownership was 81.1 per cent for men and 41.7 per cent for women.

Pond Ownership and Management

It was observed that a significant number (96 per cent) of fish farmers owned the fish ponds ($\chi^2 = 42.320$, $df = 1$, $p < 0.001$). All the men reported that they owned their fish ponds individually, while 94.4 per cent 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 (averages: male farmers more than three, female farmers less than two; U-test = 135, $p = 0.022$).

Capacity to Sustain Fish Farming

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

Since the poor, especially women, faced resource constraints, they were advised by extension workers to pool their resources, such as social capital, land, financial resources and labour (FAO 1997). Poor fisher folk sometimes merge their limited resources to make a living. It is important to note that social capital was seen by the farmers as

one of the most important assets enabling the poor rural population to satisfy their needs.

Allocation of Labour

Farmers described fish farming as a labour-intensive enterprise, and success required the active involvement and commitment of the household heads as well as involvement of the other household members. Many respondents claimed that family labour input was an essential component for success. In fact, fish farming was often understood to be a family business, and family members were involved in predation control, fry production, input purchase, slashing of weeds, marketing, and pond management. Hired labour was an alternative that was sought after when it came to difficult 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 fertilisers and other necessary activities were in the domestic domain where women and children dominated, while men did mainly the harvesting and marketing.

Gender was not the most important criterion for the division of labour among the fisher folk; 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 (24.7 per cent from 8 a.m. to 10 a.m.) and late in the day (27.8 per cent between 4 p.m. and 6 p.m.). Only 3.1 per cent of the farmers were involved in 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 for women (FAO 1994).

Extension Services

The findings revealed that there was little technical support and monitoring from either district or extension workers. The extension

agents rarely visited the farmers, so information dissemination was poor, and the farmers had little or no opportunity to be trained by government workers. This poor information flow had two main implications: either the farmers continued to practise fish farming in a traditional way or they had to travel 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 organised were very far from home.

Farmers reported that lack of capital was one of the major factors hindering aquaculture development. Capital was required to purchase inputs, such as feeds and fertilisers, to improve farm output. Funds were also required to expand the ponds and purchase equipment necessary for pond work. For harvesting, many farmers had to rely on either district or public facilities, or on borrowing nets and other equipment, because the nets farmers required were unaffordable.

Affordable methods, such as the use of hooks were not only time-consuming but also disadvantageous because it often injured the fish. Poor farmers lacked gear, such as nets and borrowed nets from neighbours at night (when the owners would not be using the nets), but harvesting fish by night exposed the harvested fish to theft – sometimes hired labourers visited the ponds before the owners and got away with the fish.

In general, fish farming has always been taken as a supplementary activity and given less priority than other farm activities. Support from the government and other partners was limited – only one NGO had made support to fish farmers its priority, especially to the women's group. There was a need to address these constraints if endeavours to reduce poverty through 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 constraints necessitated the development of socially acceptable approaches for training the farmers and transferring breeding technologies to them. Constraints, such as poor pond

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

Harvesting and Marketing

Because of the ease of harvesting using nets, most fish farmers (79.3 per cent) used seine nets. Most (86 per cent) 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 categorised according to gender, the trend was similar, with more men (94.1 per cent) than women (70 per cent) saying that they found it easier to harvest their fish using nets.

Markets for pond fish was reported as readily available by most (76.9 per cent) fish farmers. Most (67.3 per cent) sold their fish to local communities around the fish farm, while 19.2 per cent sold their pond fish on pond sites. Very few farmers (9.6 per cent) had access to foreign markets.

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 made by the group. In situations where the group contained both men and women, the men made decisions alone.

It is important to note that the benefits perceived by the groups and respondents differed according to sex. In Uganda, gender ideology has inevitably led to unequal distribution of economic benefit between sexes (Olinga 2000). Males looked at benefits from the financial aspects, and female respondents viewed benefits from social aspects, such as nutritional improvements and social interaction.

Most of the fish farmers (94.1 per cent) used part of the harvest from their ponds for family meals. It was reported that 11.1 per cent of the farmers and their families ate fish once a week; 22.2 per cent ate fish whenever they wished to do so; another 22.2 per cent claimed that they ate fish only after a harvest.

The main reason that farmers were engaged in fish farming was to rise above poverty, but most had failed to do so. Income from fish farming has remained generally low, but non-cash benefits were perceived to be high. These included provision of fish protein, land utilisation, knowledge- and experience-acquisition, and increased social interaction.

Discussion

Gender Disparities

The relationships between gender and aquaculture development in Uganda were clearly complex. While some dimensions of this interaction had been documented, the underlying differences regarding fish-farming resource, access and control and demographic characteristics – such as age, education level, marital status, household size and other occupations – have not been given sufficient attention. The findings of this study revealed various modes of decision-making regarding the benefits. Fish-farming activity was dominated by men, who comprised the greater proportion of fish farmers in most communities in the area. Studies done elsewhere indicate that fish farming in Africa is seen as a male activity, while pond management was carried out by their spouses (FAO 1994).

This study indicated a clear educational disparity between the males and females within the fishing community. This had serious consequences for the women involved. The findings further indicated that the education gap between the sexes grew wider at the higher levels. African culture in general offered male children greater opportunities in education – and in life – than to their female counterparts. Often in Africa, parents are not willing to invest in education of the girl child, considering it a gamble with their wealth. An implication of gender-differentiated education is that women are likely to derive little benefits from emerging technology-driven-sectors, such as aquaculture. This has deep ramifications since women are relatively more involved than men in small-scale fish farming (UNIFEM 1993).

In African communities, it is uncommon to remain unmarried; marriage is an institution that gives a person an important social identity. It is commonly understood that marriage is so important that access to and control over resources depends to a large extent 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, on the assumption that they will become warriors and defenders of their families, while for women marriage was seen as an end in itself. Resource allocation in Sub-Saharan Africa is more in the male domain, and women's access to resources depends on their kinship relations, such as blood relationships and marriage (O'Connell 1994). An implication of this attitude is that single women are socially isolated and under considerably greater economic stress than their male counterparts are. It was therefore not surprising that married individuals had more opportunities to take on fish farming than non-married ones had.

Historically, men have been accepted as heads of the household. Where the woman is actually in control, this must be disguised and the man must appear to be in charge. In Africa a general pattern of ownership of family property and authority is vested in the head of household, who is almost invariably a man—even in cases where he is not physically present at home (Rogers 1980). With regard to fish farming, the male head was responsible for activities, such as control over the entire procedure. 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 per cent. In spite of this development, the position of women has not changed much with regard to household decision-making.

Male-headed households in Africa are usually larger than female-headed ones. According to O'Connell (1994), this has been due to various reasons, for example polygamy, adoption of orphans and levirate (orphan and widow inheritances) which usually put the

upkeep responsibility on the male household head. Large families are also valued in local cultures and both monogamous and polygamous marriages tend to have large numbers of children and consequently bigger household sizes. Much of Africa has been dominated by such cultural practices, and Uganda is no exception.

Value of Fish Farming

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

At the time of this study, aquaculture production in Uganda and other Sub-Saharan African countries was still relatively low. This has been attributed to a lack of essential factors, such as information: Brugere *et al.* (2001) have pointed out that this limited access to production information has curtailed the growth of aquaculture, and local studies by the National Agricultural Research Organisation (NARO 2000) also indicated that aquaculture had not reached its potential.▪

At individual level, there was a widespread disparity regarding access to information between the commercial farmers and the poorer subsistence farmers. This was because of an 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 problems, especially when it came to feeding of the fish and the management of ponds, since these were the wives' responsibility resulting into low productivity. Earlier findings also showed that a lack of production information was responsible for the poor returns and low quality outputs which placed poor farmers, including the women, at a disadvantage (FAO 1994).

Farmers caught up in this situation often found other sources of information, for example, business communities, community-based organisations, and friends, as well as from well-wishers, such as researchers who are not gender biased. The availability of such information was attributed primarily to the involvement of gender-sensitive NGOs.

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. In every society, men and women have been allocated different roles, but gender role allocation has favoured men. According to Madanda (2003), lucrative activities have been allocated to men, while women participate in reproductive and community roles.

Providing families with food and alternative sources of protein was another reason why many farmers were involved in fish farming – which is why the activity was considered a family enterprise. Nutritious foodstuff, such as fish was not readily available, because fish from the market was unaffordable to local communities. The rising cost of fish 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 African countries has had primarily social goals, such as community development and nutrition improvement. Lately, economic objectives have been included on the agenda – objectives, 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 participate equally in fish farming but control of proceeds has been the prerogative of men. Other findings 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, involves a complex division of labour as well as social relations that entail differential ownership of property and social status. A gender-ideology definition of specific spaces for women and men in 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 emerging opportunities because of their limited authority in the household. Similarly, in Cambodia, Thailand, and China, women often bear sole responsibility for aquaculture production because of male migration to cities (Brugere *et al.* 2001), and a similar situation prevails in most African societies, including those in Uganda.

As regards inputs other than labour, it was found that essential feeds, fertilisers and fish seed 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 trading centres and local shops. Locally obtained feeds were from natural productivity due to pond fertilisation or made on the farms. Common feeds included yam leaves, several other leafy materials, and food remains from the farmers' homes; and fertilisers included both chemical and locally available organic fertilisers, such as cow dung, poultry waste, and brew waste. It was noticeable in the area of study that most ponds were new, and access to supply of fish seeds depended on a variety of sources. In periods of feed and fertiliser shortage, inputs have to be bought, which may be a disadvantage to women since they usually have less capital than men.

Control of Resources

Findings from this study indicated a relationship between resource ownership and marital status. Women who owned land and fishponds were either widowed or *de facto* household heads—land rights continue to be given to male household heads. In Africa, ownership and

utilisation of land are governed by patriarchal ideologies. Sub-Saharan African governments, including that of Uganda, have maintained the *status quo*, favouring male ownership of land. In this study it was found that women had little control over land and other productive resources, and male farmers owned the land where the ponds were constructed. The poor and women are able to acquire land and other resources only through rent or by seeking permission from family heads, who were usually male kin. It is commonly understood that a woman's ability to gain access to resources within a rural household or community was dependant on kinship systems, marital status and motherhood.

Findings from national surveys have indicated that, despite the redrafting of the Ugandan constitution in 1995, the situation of women with regard to ownership of land was still problematic. It is commonly known that in Uganda, particularly in the rural areas, gender relations with regard to ownership of resources are dependent 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 women can access land through their relations with a father, husband or brother in most Ugandan communities, women did not own land. This implies that women had to obtain permission from their husbands or male relatives to use land. This was the case because much of Africa, and Uganda in particular, was still governed by customs that limit women's control over land and other production factors (O'Connell 1994).

Problematic access to and control over resources was not limited to family or personal land but permeated all areas of access to and control over resources. It has been reported that women's limited access to and control over resources was a kind of marginalisation internalised in cultural ideology which has given men effective control over productive asserts (WHO 1995 cited in Bukokhe 2004). Male farmers had more control than women over land issues – 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 through mutual partnerships, such as with an individual who owned land.

To maximise the profit from land (rented or otherwise), women combined fish farming with other activities. Findings from this study indicated that fish farmers were involved in other farming activities, which included crop plantation—for example, sugar cane, maize and banana growing. Livestock production was also mentioned (poultry, dairy cattle, goats and pigs). Other activities included clay mining, biogas production and forestry or agroforestry. More than 54 per cent of women fish farmers were carrying out concurrent crop production, while 36.5 per cent gave livestock as an additional farming activity. It was further observed that, among men, 79.4 per cent were engaged in crop production compared to 60 per cent of 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 males owned the means 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 ensuring the usual 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" and "expected", or at best light work, the gender relations and the likely implications under which women perform these rigid roles are not 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 is clearly revealed in the words of a male farmer from Wakiso district: "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."

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

Many of the farmers who made up the sample population for this study pointed out a number of problems associated with fish farming. Some problems, they said, could be attributed to the fact that gender ideology plays a significant role in the distributive roles and processes of aquaculture. Constraints, such as limited access to technologies, skill and knowledge disparities among the male and female farmers, failure of extension workers to reach the poor, and inadequate technological transfer were seen to be ubiquitous. According to FAO (1994), failures in the development of socially acceptable and gender-sensitive approaches to training development and the transfer of technology for fish production have been attributed to the fact that women and the poor were not reached at all. The assumption that fish-farmer husbands would pass on 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. Despite the fact that women did most of the crucial work necessary for fish survival, they were not provided with the necessary training, as instructors concentrated on training male farmers (UNIFEM 1993).

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

Conclusions

Aquaculture is essentially an agricultural activity, competing with other agricultural 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 agricultural enterprises, such as cattle, goat keeping and poultry farming. Fish farming required resources that include land, fertilisers, information and labour – which most of the poor lack. In rural areas, access to such resources was determined by kinship ties. The gender-based division of labour is a social structure that, when applied in its current form, is disadvantageous to development of aquaculture. This should be addressed through the inclusion of gender-sensitive packages within aquaculture projects and programmes.

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

It should be emphasised that the gender concerns, especially access to and control over resources, inputs, labour allocation, the acquisition of fish farming technologies – as highlighted in the present study – and a general realisation of benefits from aquaculture, are evident and must be earnestly addressed.

Recommendations

A number of national and international interventions have been put in place in pond fisheries, with a fair amount of success, but the development of aquaculture has not yet reached its potential. One fundamental reason for this is the lack of information on the

development of the various aspects of the aquaculture sector (NARO 2000). There was a need for intense gender-based research, to find out more about the needs and aspirations of fisher folk, including poor men and women. As a result of the 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 is therefore necessary to involve the main actors in aquaculture, and to assess the gender relations of men and women with respect to labour, income, and the problems they face as community members.

There was also a need to change approaches to development, because aquaculture in Uganda has been subjected largely to the law of subsistence rather than the law of value, in which interests of the male head come before needs of household. It was noted (Himmelstrand 1994) that the law of subsistence still permeated much of rural Africa. There was a need to design strategies to address the needs of the fish farmers in Uganda, taking care of the interests of all genders, and taking advantage of opportunities offered by the government's Plan for Modernisation of Agriculture, which was released in 2000.

The findings of this study revealed that NGOs had better access to the poor and the underprivileged than government officials and agencies had. The NGO staff's efforts should be commended and emulated by government agencies. It is important that avenues for providing social capital be encouraged, to help the generally underprivileged to share in the benefits of development. It is expected that such groups will provide better opportunities for the exchange and dissemination of information, and facilitate easier access to institutional credits.

There was a need to involve women and enable them to describe in detail the social, cultural and economic constraints they confront in fish farming. This was important because findings indicated that women contributed more than men did 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

had proved that when real life situations of women were not featured into policies and programmes, development was impeded; and the situation grew worse over time. Women were not the only issue; both men and women must be lifted from poverty; both must contribute to and benefit from development efforts.

There was a need to educate and create awareness amongst the fisher communities of the importance of proper management of wetlands as habitat for cultured fishes and the conservation of a healthy environment. The majority of aquaculture practices around the world have resulted in significant nutritional and social benefits, generally with little or no environmental or social costs (Bhattacharya 2004).

There was a need also to develop aquaculture extension materials that were gender-sensitive. Since it was mostly women who were involved in small-scale fish farming, their interests should be recognised 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 possible level of information. This could be achieved through the 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 transferring technology in fish culture in the Lake Victoria basin be instituted.

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7

Southern African Programme for Improved Transboundary NRM: Equitable Access and Benefit Sharing

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Introduction

The livelihoods of most people in southern Africa are dependent on the use of natural resources and the environment. These people, especially rural communities, depend on biological resources on a day-to-day basis for survival. These resources provide an important renewable source of income through the sale of timber, energy, woodcarvings, household goods, and tourism services (consumptive and non-consumptive). 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 state level alone because the resources straddle international borders. Major rivers form the boundaries between several Southern African Development Community (SADC) countries and numerous valuable wildlife populations migrate across human-made borders. Because of this, southern Africa has witnessed a steady increase in trans-boundary natural resources management (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 an area encompassing the administrative districts of Magoe and Zumbu in Mozambique,

Luangwa in Zambia and Guruve in Zimbabwe. A dozen TBNRM initiatives are started in the ZIMOZA region. Many countries in the region are in the process of developing “TBNRM policies” or legislation to establish cooperative arrangements with neighbouring states for the implementation of transboundary initiatives. TBNRM initiatives aim to protect ecosystems that straddle national boundaries. It is worth noting that such ecosystems are more than usually prone to over-utilisation. The local users of these resources cannot control the use or impacts caused by the different actors involved in their exploitation.

Despite being based on a sound rationale, TBNRMs have proved difficult to implement because of ill-defined rights to land and resources in most communal areas. The conditions under which the state and/or the private sector can engage with communities are in many circumstances unclear, and these communities are therefore often just not taken into account. Thus, far from bringing different countries together, or bringing different levels of society together, TBNRM may create rifts and alienate communities from this development opportunity. Equity in access to natural resources and the sharing of benefits from their uses are therefore critical and largely unacknowledged issues in TBNRM areas. This research examines the roles, rights and responsibilities of men, women, children, the young and the old, and other marginalised groups, in accessing shared natural resources and in sharing the benefits arising from their use.

Background and study area

A Brief History

Although it is common to find the abbreviation TBNRM in literature, it refers in fact to many initiatives, which differ in terms of their rationale as well as their goals and objectives. Jones and Chonguica (2001) grouped TBNRM initiatives into four broad categories: (i) transfrontier conservation areas (TFCAs), (ii) spatial development initiatives (SDIs), (iii) development corridors, and (iv) transboundary natural resource management areas (TBNRMAs). Under this categorisation, the ZIMOZA area is classified as a TBNRMA. The ZIMOZA project

therefore embraced the generic dominant objective of TBNRMAs, namely sustainable natural resource use for improved livelihoods.

The idea for a ZIMOZA TBNRM initiative was conceived in 1999, when the Zimbabwean deputy minister of Mines, Environment and Tourism at the time requested the World Conservation Union (IUCN) to facilitate collaboration in the management of the natural resources shared by Zimbabwe, Mozambique and Zambia. The IUCN mobilised funds for this exercise under their Networking and Capacity Building Programme. In the same year, two workshops were organised 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 of solving these problems. A vision for the TBNRM area was developed, and a steering committee elected. This committee comprised two representatives from each country, from their respective local and central governments (Mbizvo and Guveya 1999). Strategies agreed upon for solving transboundary problems included the need to standardise natural resource inventories, the harmonisation of laws and policies, joint management plans, and the formation of inter-district committees. There was also much emphasis on functional collaboration as the dominant strategy for implementing the TBNRM initiative, and this aspect was in part operationalised by funding meetings of the steering committee. Despite the emphasis on functional collaboration, discussions at the workshop also noted that the improvement of community livelihoods was a fundamental part of the initiative. Decentralisation and devolution were therefore proposed as means through which community participation would be ensured (Mbizvo and Guveya 1999). As consultations progressed, the need to focus on local communities became even more evident (IUCN 1999; IUCN 2002).

The second workshop was held in Kanyemba-Chapoto ward in the study area. The same issues were discussed but targeted participation at 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 to May 2001, socioeconomic studies were sanctioned and community consultations convened. The findings were incorporated into a Framework Agreement, which has since been finalised. The management plan spelt out community empowerment as a priority for TBNRM. The strategy for the TBNRM area was to strengthen community natural- resource management institutions for effective TBNRM. Institutions specifically identified were the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE), the Tchuma Tchato project, and the Administrative Management Design (ADMAD) (programme (IUCN 2002).

The TLAC 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 2001). The TLAC was viewed as being instrumental in ensuring local communities' cooperation for TBNRM and its meetings were funded by the project. Although the three countries had not yet signed the Agreement, TLAC activities were initiated. 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. Members of the TLAC were trained in participatory techniques in community development and project management. A bee-keeping viability assessment was conducted, boreholes sunk, and fish-smoking kilns were built in the area. The project also donated equipment for anti-poaching operations: two speedboats and a motorbike. Despite these successes, the field office was closed in December 2003 as 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) promulgated by the Convention on Biological Diversity (CBD, Article 1 www.cbd.int/convention/convention.shtml) (UN 1992) is concerned with how regulations can be instituted to protect the rights of individuals or groups so that they 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 conceptualising access and benefit sharing of natural resources, the costs associated with both conservation and use are viewed as important because they determine whether the “benefits” provide sufficient incentives for conservation. Thus equity has also to be considered within the context of allocation of costs and benefits. Although originally formulated within the context of genetic resources, the definition of ABS is now 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 overemphasised; it is a key asset which rural people use to make 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 means that access to natural resources is a major governance issue on which democracy must deliver. Mechanisms for regulating access to and sharing of benefits arising from the use of biological resources have been in existence for a long time in southern Africa. They have, however, only recently been recognised formally and popularised through the promulgation of the CBD and the International Treaty on Plant Genetic Resources for Food and Agriculture. 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 to and 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 of the CBD requires access (of which more in the next paragraph) 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 (RDCs) 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 requires parties to create conditions to facilitate access to genetic resources for environmentally sound uses by other contracting parties. Tamale (1999) highlights two important issues arising from this 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 maximisation 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 its value, and that this will be acceptable to the party seeking access.

There is further conflict surrounding this issue where authorities – for example fisheries and wildlife authorities – impose on communities restrictions regarding levels of harvesting. The countries in the study areas had common resource pools – fisheries, wildlife, and water resources – but regulations were different in the different countries. 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 environmental impact assessment (EIA) and the precautionary principle were attempts to mitigate this problem, in southern Africa ABS was in practice a subjective area beset by ambiguity, divergent laws, policies, views, and institutional arrangements.

Gender and Natural Resource Management

Gender has been defined as referring to the socially constructed roles of men and women (Nabane 1998). More recently, gender has been expanded to explore the different constructed roles which distinguish different age groups, as well as the two sexes. These gender groups are socialised to carry out different functions, amongst which are the utilisation and appropriation of natural resources (Villalobos, Lobo, and Cascante 2004). The relatively recent focus on gender in natural resource management (NRM) stems from the realisation that different gender groups establish different relationships with the natural environment (Villalobos, Lobo and Cascante 2004) on which their livelihoods are heavily dependent.

Many processes have been initiated directly or indirectly to address the question of gender and NRM (Table 7.1). These initiated processes underpin the importance of recognising 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 7.1. 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	Fourth World Conference on Women (Beijing Conference) and 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; and it is worth noting in this regard that defining local and non-local resource owners 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 wide acknowledgement that women play a central role in NRM, there have been only limited efforts to incorporate gender perspectives into national and legal policy frameworks. Thus global and regional environmental-governance processes, TBNRM included, based on existing national frameworks, face the risk of inheriting the “gender silence” found in earlier national policies and conservation programmes. In current trends in the water sector, for example, there is failure 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; and patriarchy inhibited the effective participation of women in formal institutions for water-resources management. The consideration of gender in ABS is thus timely,

because developing countries are being encouraged to develop ABS legislation to increase the benefits from the natural environment that should 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-watered or planted on wetlands, while irrigated cash-crop agriculture was often the preserve of the male population. Although women's water uses, such as for gardens, had not taken centre stage in 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 to meet household needs including food, education, clothing and medical needs. In addition, gardens were not only an important means of coping during drought periods but were also 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 have till now proved futile.

The water reform process was designed to rectify the unequal distribution of water resources through decentralisation. This process, however, focused mainly on commercial water uses (mostly irrigation) and placed only marginal emphasis on small-scale production. The decentralisation of water management also failed to improve women's position in water management because they did not have the technical training to fill the positions. There was still, however, concern about how water should be managed to improve women's access to and control of water resources and how they, i.e. women, could benefit from 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—, who became vulnerable because their perspectives were not incorporated in conservation and development programmes. This had negative impacts, both for conservation and for the livelihoods

of the rural poor: conservation efforts would lose the knowledge that different gender groups have—knowledge which could form the basis for innovations and adaptive capacity within these programmes. This was especially valid since it is women who were in daily contact with soils, water, fuel wood, and plant and animal species, and it is women who educate future generations within their communities about these resources. The evaluation of the impact of conservation and development activities on rural livelihoods was biased towards men, to the detriment of other gender groups. Ultimately, efforts to conserve biological diversity would not only be sub-optimal (Tamale 1999) but might provide insufficient incentives for women, girls, boys and the elderly to participate.

Gender Issues in Land-based Resources in Zambia

All land in rural Zambia belongs to the state, and is held under customary systems presided over by chiefs. It is also possible to gain title to customary land upon the chief's recommendation. Thirty per cent of all land was reserved for women (SADC 2003), but it was nevertheless very difficult for women to obtain land title from the authorities. The statutory system in some districts required married women to obtain permission from their husbands before applying for land. Unmarried women were also seldom recommended unless they had children (Nayaran *et al.* 2000). Furthermore, access to land did not guarantee access to other land-based resources, such as forestry, water and wildlife products, which were governed by different institutional arrangements. Narayan *et al.* (2000) noted that even where legal rights to land exist, women were not aware of this, owing to a general ignorance of laws and regulations. The problem was perpetuated and worsened by high levels of illiteracy among rural women.

From the foregoing emerges the need for a gender analysis of TBNRM. Gender analysis entails separation of the roles taken by the different gender groups, allowing the proposal of actions for tackling existing inequalities (Villalobos, Lobo, and Cascante 2004). Gender analysis is, however, commonly included policies, programs and

other NRM initiatives as decorative or anecdotal information, which fails to identify and propose actions to transform inequitable access and benefit-sharing arrangements. This study puts special emphasis on the gender dimensions of access to and control of resources, and proposes practical actions for addressing these aspects in the context of transboundary NRM in southern Africa.

Institutions Governing Access and Benefit Sharing

Access to natural resources is structured at different levels—household, village, national, etc.—by institutions that impose rules and regulations for the management and use of resources. The rules defining access commonly come in the form of property rights, norms and values (Scott 1995), and formalised decrees, such as laws, policies, and regulations. Often multiple institutions influence access to natural resources, and they can 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 areas.

Policy, Legal, and Institutional Frameworks for Natural Resources Management

Land Tenure in Zambia, Mozambique and Zimbabwe

Land in Zambia is state-owned, with 94 per cent held under customary or up to 99-year leasehold tenure systems. As has been mentioned, it is only possible to gain title on customary land upon the chief's recommendation. In addition, thirty per cent of all land, as already mentioned, is reserved for women (SADC 2003). The chief allocates land in the customary areas, and the rights of individuals are subject to the prevalent customary norms. Government reservations are a third form of landholding, allowing the government to manage the land resource in the public interest (ZERO 2002).

In Mozambique, too, all land is state land, with rights to occupation and land resource use by rural communities recognised by law. Here

land allocation is the chief's prerogative, and 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 as concentrating power in state agencies, thus denying 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 licence (Mohamed-Katerere 2003).

Wildlife Management

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 at the time of this study) that cover 15.6 million hectares are of special importance for this study because of their establishment on customary land, under the jurisdiction of chiefs. This type of situation usually leads to institutional conflicts over 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 local people is defined as illegal/unlicensed owing to marginalisation of the local people regarding structures of wildlife use, management, and benefit sharing (ZERO 2002).

Wildlife Management in Mozambique

Wildlife resources in protected and non-protected areas in Mozambique are under state control 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 exist adjacent to gazetted protected areas (IUCN/FAO/DNFFB 1997). Personnel and expertise are extremely sparsely distributed in relation to the expansive wildlife resources,

especially at provincial and district levels. The situation is worsened by inadequate communication, transport, equipment and funds, which hinder the enforcement of regulations and reduce the monitoring capacity of field staff within the DNFFB.

Wildlife Management in Zimbabwe

In Zimbabwe, the Parks and Wildlife Act (Government of Zimbabwe 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) within the Ministry of Environment and Tourism 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 CAMPFIRE, a community-based natural resource management programme. This programme allows communities to benefit from wildlife exploitation, mainly as 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" status to landowners and landholders (Rural District Councils), thus making them owners of such wildlife as they can manage and benefit from, and accords them the privilege to make access and benefit-sharing decisions for the local communities. However, because of the absence of legal title to land, the rural poor cannot be granted appropriate authority status for wildlife management and utilisation.

Communal Approaches to Wildlife Management

Communal approaches to conservation prevail as the main mechanisms 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 high prices for trophy hunting. The revenue allocated to the community is used for social infrastructure development, including schools, clinics, and boreholes. Trophy hunting has proved to be the most profitable venture, bringing in large revenues worth investing as community capital (ZERO 2002).

Participation in resource governance has been realised mostly through community conservation. Empirical experiences in these programmes have, however, depicted communities as “losers”, trapped within a deep chasm between what is written in policy documents (*de jure* policy) and what people actually do (*de facto* policy) (Anstey 2002).

Tchuma Tchato (TT), the Mozambican CBNRM programme, started in 1994 and obtained its legal status from a special decree (Interministerial 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 village council elected at village level, and a superior council (SENTENCE). The SENTENCE is responsible for overall management and has representatives from the village council and other stakeholders – state agencies and NGOs. The main constraint, as far as local people are concerned, is poor and insecure property rights. Poor people also lack the resource and business management capacity to exploit fully the existing potential for increasing the benefit streams (IUCN 2003).

In Zambia, similarly, 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 that funds from trophy hunting are remitted back to the producer community (IUCN 2003). In Zimbabwe, CBNRM has been going for longer than in the other two countries, so communities and all the other institutions involved are more experienced. 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 (Government of Zimbabwe 1975).

Water Management in Mozambique, Zambia and Zimbabwe

Water Management in Mozambique

In Mozambique, all ground and surface water is the property of the state. Provision is made under the law for easy and free access to water for primary purposes. Significant abstractions, however, require authorisation and registration. This is subject to licensing procedures, where an application for private water rights has to be made. Rights to water are then conferred 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 belongs to the Ministry of Public Works and Housing, and the lead agency in the Ministry is the National Directorate of Water. Water resource management is implemented at central and local levels by the National Water Council and the Regional Water Administration. The regional administration carries out licensing functions, and control and administration of public water. It works at river basin level, and the possibility for greater local level participation is through Basin Committees. In the study area, the regional administration does not yet exist; and the functions of licensing, control, and administration of public water are carried out by the Provincial Directorate of Public Works and Housing.

Water Management in Zambia

All public water in Zambia is vested in the president. The Water Board grants water rights in accordance with the Water Act, and the Ministry of Energy and Water Development is responsible for water resource management. Under this Ministry, the Department of Water Affairs undertakes water resource assessment and development.

Primary purposes of water use are given as livestock and domestic consumption and are not granted without licensing. A permit is required for secondary (irrigation and fish culture) and tertiary (industrial, mechanical and hydroelectric) purposes. Water abstraction in general is not controlled effectively owing to inadequate monitoring capacity, so the provision that makes it an offence to abstract without a water right, or beyond the allocation of a water right, becomes ineffective.

Water Management in Zimbabwe

In Zimbabwe, water resources fall under the Water Act and the Zimbabwe National Water Authority (ZINWA) Act of 1998 (Government of Zimbabwe 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 resource management is decentralised through catchment and sub-catchment councils. Through these councils, local water users participate in deciding how to price and manage water. With the approval of ZINWA, catchment councils issue licences for secondary water use.

Fisheries Management

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. Policies were centred on increasing fish production for self-sufficiency, and maximisation of employment creation, but this was done without regard for

sustainability, resulting in overexploitation. Prevailing regulations vest fishing control and management in the state, and provide for commercial fishing in all Zambian waters. Conservation is regulated through state control rather than public participation, but enforcement of regulations has always been low. Any citizen can easily obtain a licence for fishing. Lately, there has been some community-based co-management of fisheries. As well as covering administration and management, the fisheries have a branch with sections dealing with research and extension.

Fisheries Management in Mozambique

Fishing resources in Mozambique are public property, held in trust by the state (Law No. 3/90). National policy emphasises the development of small-scale fisheries. Any citizen can be granted access to fish in the Zambezi River. Conservation is enhanced through fixed resting periods, and controlled fishing areas. The main weakness of the policy is its lack of reference to the rights of communities, coupled with poor 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 are administered and governed by the National Parks and Wildlife Management Authority (NPWA) under the Parks and Wildlife Act (Government of Zimbabwe 1975). The NPWA controls fisheries directly or grants "Appropriate Authority" status to some landowners to manage fisheries. In the Zambezi River fishing without a licence is allowed, provided that only simple technology (fishing hooks and lines) is utilised. Commercial fishing, however, requires a permit, which the local people consider restrictive.

Research objectives

The overall objective of this 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 to determine how they share the benefits accruing from the use of these resources.

The specific objectives were (i) to analyse who has access to and benefits from shared natural resources in the ZIMOZA area, considering a gender perspective; (ii) to develop policy recommendations on gender and equity issues concerning access to and benefit sharing in TBNRM areas in southern Africa; and (iii) to disseminate research findings on access to 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, using semi-structured interviews, focus-group discussions with institutional preference and ranking matrices.

Study Area Location The ZIMOZA TBNRM area encompasses the administrative districts of Magoé and Zumbu in Mozambique, Luangwa in Zambia, and Guruve in Zimbabwe. These areas 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. There is commonality of language and cultural origin, and many villagers cultivate and use forest products across the borders, especially when there has been cross-border marriage. Infrastructure in the study area was poor, and the area was not suitable for agricultural activities owing to low rainfall and poor soil fertility.

Luangwa District (Zambia)

The Luangwa district in Lusaka province has an area of approximately 3,600 square kilometres. 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 (350 metres at Luangwa Boma in the South and up to 1,300 metres 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 the Chiuwa and Rufunsa Game Management areas. The land use patterns in the ZIMOZA included three distinct categories of vegetation. These were (i) forests (riparian forest/riverine vegetation) found along the fringes of the Zambezi and Luangwa rivers; (ii) woodland (miombo/mopane and acacia/muunga); and (iii) grassland, mainly found on various wetlands systems. Soils are acidic and of low fertility, while rainfall is poor, ranging from 400 to 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 practised as livelihood strategies.

Zumbo and Magoe districts in Mozambique

The Zambezi River divides the Mozambican districts of Zumbo and Magoe for a long stretch of 100 kilometres, from the confluence of the Zambezi and Luangwa rivers to Lake Cahora Bassa downstream. With its abundant resident population of wildlife, its vegetation and many migratory birds, the Zambezi has a profound influence on the local ecology. It is a vital habitat especially during the dry season. Species common to the area include elephant, buffalo, hippo, crocodile, eland, roan, sable, antelope, waterbuck, and zebra, as well as the carnivores, such as lion, leopard, cheetah, the African hunting dog, and hyena. Major vegetation types included miombo (dominated by *Brachystegia*, *Julbernardia globiflora* and *Isoberlinia globiflora*) on the plateau and escarpment areas, mopane on the central core of the valley, and muunga (dominated by *Acacia*, *Combretum* and *Terminalia* species). Riparian forest was also found along the Zambezi and its tributaries, and the associated wetlands were dominated by grasslands (IUCN 2003; Namanha 1999; Brown 1998).

Agriculture was the main local livelihood strategy, practised mainly by women. The major crops grown were maize, sorghum, various kinds of beans, and groundnuts. Summer cultivation was mainly rain fed, and 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 on the north-eastern border, 300 kilometres from the national capital Harare. Guruve is the administrative centre. Chapoto ward is part of the Dande communal area, bounded to the West and Southwest by the Doma and Chiwore safari areas. The whole area lies in the Zambezi valley, with its associated high temperatures and low rainfall. The ward is characterised by a flat terrain with shallow calcimorphic soils that are unsuitable for agriculture except for the alluvial deposits of the Mwanzanutanda River floodplains. With little or no machinery available, most cultivation is done by hand. The two major ethnic groups are the Chikunda and Tembomvura (Ranganai and Zaba 1995).

Agriculture was the major livelihood strategy in Chapoto. The people grew maize for subsistence and cotton for market. Cultivation was mostly on the nutrient-rich floodplains of the Mwanzanutanda. Increase in agricultural productivity was limited by the high temperatures and the shallow and highly erodible soils, which together resulted in very low moisture levels. Cattle were almost non-existent because of tsetse fly infestation. Fishing was an important source of protein and revenue, though not as important as it was in Zambia and Mozambique. This was because the Parks and Wildlife Management Authority allowed only fishing with rods and hooks, unless a commercial permit had been 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 initially through consultations, and later through representation in the TLAC, which was the community focal point for the TBNRM processes. At the first stakeholder consultation meeting, there were six representatives of local government authority, nine officials from IUCN, six from NGOs, fifteen from government agencies, two from universities, a secondary school headmaster, a consultant, and (chief Mburuma) from Zambia (Mbizvo and Guveya 1999). Based on community preferences (Table 7.2), Chief Mburuma was the only community representative at this meeting of 41 people.

A second meeting, held in Kanyemba ward, was supposed to have targeted the local community, but the list of participants still showed a dominance of non-local stakeholders, with 20 from local government, 13 from government agencies, 3 from private companies, 3 from NGOs, and 4 local community representatives (IUCN 1999). The four 'community representatives' were an anti-poaching scout and three traditional authorities (one chief and two village heads). It is important to note, however, that there may have been more than four community representatives, since the official attendance list is based on those who actually fill in an attendance slip. It is nevertheless not surprising that the communities considered their participation inadequate: the councillor from Kanyemba ward pointed out that from the way the project was implemented, "... it seems as if they sort of guessed what we wanted, without actually asking us."

The low involvement of local communities was also due to the lack of a common vision for the project. The people in the ZIMOZA TBNRM area considered the project to be about the relaxation of immigration and customs regulations, and the improvement of community wellbeing through livelihood projects. The TLAC, however, had a different but

more accurate overview of the vision and purpose of the initiative. This information asymmetry depicts the extent to which local communities had no real ownership of the process through which the TBNRM area was created, and the fact that community representatives (the TLAC) failed to report back effectively to their constituencies.

Consultation with women and youths was even poorer, with male adults dominating local development activities in the study area. Women constituted only 22 per cent of the participants in the first stakeholder consultation, and 11 per cent of the participants in the second stakeholder consultation. Such poor representation during TBNRM consultations diminished the ability of communities, and the different gender groups that constitute them, to lay claim on natural resources. To make matters worse, the community meeting was held for only two days and not all issues on the agenda were covered.

Institutional Setup

The second level of community participation, selection and representation in the TLAC illustrates poor participation. This is a result of 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 including Luangwa, Guruve, and Zumbu. (Known population statistics were Luangwa 25,190 in 2001, Guruve 135,241 in 1992, and Zumbu 33,272 in 1997). The local communities were aware that the TLAC existed, but many did not know how it came into existence. Women thought they were not represented, and 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?” a woman from Kanyemba asked. There are good reasons for such questions: only 6 of the 17 members of the TLAC were community representatives, while the other 11 were from local authorities, government agencies, and the private sector (IUCN 2002). It is worth noting that the TLAC did in fact have women and youth representatives from all three countries. However,

the important issue was that these gender groups did not feel that they were adequately represented. Key questions would then be: from where did this local area committee derive its legitimacy, and whose interests did it represent?

Community members were asked: 'With whom do you prefer to work on the ZIMOZA TBNRM initiative?' Their preferences are outlined in Table 7.2.

Table 2. Community members' preferences of with whom they want to work for a ZIMOZA transboundary natural resource management

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

The most preferred set ups are clearly based at local level. This highlights the shortcomings of traditional institutions, such as susceptibility to kinship influence and a marred history of being an extension of state hegemony over the rural populace. While the preferences may be personality-based, the communities gave the following as common criteria for institutional preference: local accountability, local respect for authority, and the fact that the set ups could reduce the transaction costs (distance and time taken for effective communication, and the remittance of revenue to the community) that could be incurred in natural resource management.

The TLAC's legitimacy crisis may have emanated from the dilemma imposed by a TBNRM area that was not well defined. To achieve external legitimacy, the area had to be established at district level – the lowest level of government able to formulate and implement policy

within the area. This, however, conflicted with a proposal by local communities to delineate areas within 20 kilometre boundary from the border as TBNRM area. The TBNRM area covered four large districts, and yet the project implemented activities close to the border. In addition, at the district level, citizen participation in local governance processes was low and almost non-existent in all four districts. The TBNRM area demarcation process could thus not avoid these inherent weaknesses. This illustrates the practical problem faced by the project in the 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 management of problem animals. It is not surprising therefore that the project went on to implement activities, such as the sinking of boreholes and the building of fish-smoking kilns that were not part of the management plan. Besides increased movement between Zimbabwe and Zambia, it is these observable outputs that communities mentioned when asked about 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-mobilisation 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. According to Barrow and Murphree (2001), functional participation depends initially on outsiders but can later become enabling and self-dependent. This means that the level of community participation in the ZIMOZA project

might have improved if the initiative had 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 communities to participate in community conservation programmes, TBNRM or otherwise. The discussion in 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 for different communities, age groups, sexes, and ethnic groups. The costs imposed by wildlife exploitation are especially conspicuous, whereas the utilisation of water and fish resources does not have significant negative impacts on community members' traditional or modern livelihood strategies.

Wildlife

Costs of Wildlife

Crop damage and attacks on humans are the greatest wildlife 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 fields increases, and guarding crops necessitates people 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 are also 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 elephant and hippo commonly occur during collection of *mabuyu* and *masau* wild fruits, as well as during fishing and the 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 to fishermen, and to villagers who live and/or have crops planted near the rivers. The communities thus listed efficient problem-animal management (PAM) as one of their priority needs. They are of the opinion that the wildlife authorities do not empathise with them when it comes to problem animals, and believe that the PAM issue was downplayed in the implementation of the ZIMOZA TBNRM project.

A perception commonly held by community members is that the wildlife authorities are more concerned with preserving the animals for trophy hunting than with ensuring the 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 illustrates this: "Tchuma Tchato and this company (Mozambique Safari Company) came here to kill people." With the agreement of the men nearby with his remark, he continued, "... 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 in dealing with problem animals. The local communities in Kanyemba suggested that they themselves

should carry out PAM because they have skills and can react swiftly to a specific problem.

Access to and Benefits from Wildlife Resources

Key informants from ZAWA, the Luangwa District Council, TLAC, and the Ministry of Agriculture, Food and Fisheries reported that the benefit streams emanating from wildlife revenue in the Luangwa district were employment, schools, clinics and boreholes. Observations and interviews at village level revealed, however, that these theoretical benefits were not always realised. Villagers complained that while they were aware that hunting activities generated revenue from licences and safari tour operations, they had only heard about the benefits but had never seen any development within their territory. They attributed this to their villages being far away from Boma, the district capital. The perception was that those whose settlements were closer to the ZAWA offices were better able to influence the location of services. The villagers pointed out that this also applied to those who had access to information through close friendship, or relationship, to members of the CRB. Kanyenze is far from Boma, and its residents drink untreated water from the Zambezi River while nearer villages have borehole water. For example, in Chidada village, which is much closer to Boma, boreholes have been sunk using wildlife revenue.

Corruption was raised as the major barrier to access to benefit streams. Because the community does not know how the system works, they see it as open to abuse. For example, the location of community projects has often been close to the chief's residence.

The ZAWA attributed the lack of benefits in some of the villages to the scale on which they have to be distributed. The area is too large for the revenue allocated for communities. This problem is confounded by bureaucratic delays of disbursement: the money first goes through central government, and community allocation is then slowly remitted back through linkage structures between CBNRM and central government. Studies elsewhere within the same district have shown delays of up to a year in fund disbursement, which has resulted in slow progress and even abandonment of projects (Hachileka 2000).

The number of employment opportunities offered by the wildlife industry is low compared to the size of the local population. Game scouting is the only form of employment that communities knew about. Such employment has a gender bias since it is considered to be for the physically fit, thus excluding women, girls and the elderly. It was reported that girls drop out of school and marry earlier than boys. Coupled with their toll of household responsibilities, it is unlikely that girls would benefit from any such employment opportunities.

Informants reported that illegal hunting of wildlife was rampant in all four areas of the study. This was seen from the increase in snares (especially in Luangwa valley), the arrests of poachers, and the unprecedented decline in certain wildlife species. The community reported that illegal sales of game meat are common and have not declined. The target animals for poachers are large animals especially buffalo, warthog, zebra and kudu; elephants; and hippos. Snares are commonly used for subsistence hunting, and various types of firearms for trade hunting, though that is less frequent. Bush fires are also used for illegal hunting. In 1998, the Environmental Council of Zambia (ECZ) reported that the poaching of bush meat was a major contribution to meat sources for urban and rural areas in Zambia. (Bush meat is also given to the community when certain animals are killed during safari tour operations.) This opinion has been echoed by more recent studies (IUCN 2003) – a flourishing trade in game meat is providing incentives for poaching wild game. According to ZAWA, much of this illegal access occurs in areas where a good road network exists for efficient transportation. As a result of the lack of control of non-licensed hunting, there is a decreased observance of taboo and totem restrictions (IUCN 2003), attributed in part to hunting by non-locals. Village scouts employed under the CBNRM programme have become as resented as wildlife authorities when they perform their duties expediently – the local assumption being that they will not report on their kith and kin.

At Bawa village (in Chinthopo ward, Mozambique), proceeds from Tchuma Tchato have built a school (it is now, however, in a dilapidated state), and a grinding mill. Of the little employment emanating from

the wildlife industry, 30 people were employed formally in Magoe, but of these only three were women. There were no women in the anti-poaching unit – anti-poaching operations are not regarded as women activities for women. Women, generally, are the least educated, and thus the least likely to benefit from employment created by wildlife conservation.

Very few girls go to school and the dropout rate of those who do is high. Low literacy levels and poor education, in particular for women, diminish their ability to benefit from employment opportunities, as well as reducing input into project identification, design, planning and implementation. Wildlife benefits are far below community expectations when compared with the costs. The resulting lack of satisfaction 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 an 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 local communities. The money is used in accordance with development plans agreed on by these communities. The revenue accrued so far has been used to build a primary and a secondary school, and a grinding mill; to sink boreholes; and to purchase tractors for ploughing. Some of the funds have also been used to sponsor the local football team. There were also times when household dividends and food handouts (especially for the elderly) were given, and school fees paid for orphans. In addition, the village heads are allocated game meat killed during safari hunting expeditions.

The Chikunda people, who are in the majority here, 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. They have a history of surviving on hunting and gathering wild fruit, activities that have

been disrupted by the CAMPFIRE programme. They also had smaller landholdings which are of little use for commercial agriculture. Because of this, they are involved in 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.

It emerged from the researchers' discussions with community members that employees of safari companies and the surrounding lodges, and the CAMPFIRE committees, are a limited group of people who rotate between these jobs. Only a few people have also been employed by organisations conducting research activities in the area.

Fisheries

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

Access to fisheries in Zambia

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 a mandate to monitor fishing catch and effort, they have neither the financial resources nor the personnel to carry out this role effectively. The Department empathises 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. Department employees admitted that most of the fisher folk were not licensed.

Fishing activities are mostly carried out by boys and men, 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 take 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, "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 licences. Benefits from fisheries can therefore profit more from access to external markets and capital. Licensing does not have – and has never had – any effect on limiting the number of people who engage in fishing, nor on their levels of harvesting. This is because, firstly there is no limit to the number of licenses given and secondly because a significant proportion of the fisher folk are not licensed. Over-fishing is worsened by the fact that either a Zambian or a Mozambican licence will suffice for fishing in the Luangwa as none of the authorities have greater jurisdiction over these shared waters. Fisher folk exploit this jurisdictional overlap and the resulting confusion in the management of the river.

Cross-border kinship ties are very important and guarantee access to fisheries. For example, some Zambians have families living in Mozambique. The lack of any limit on the number of licences issued, coupled with poor enforcement of fisheries regulations, mean that fishing in the Luangwa is, in effect, an open access situation. Destructive practices, such as fish dragging using gill nets are therefore very common. This is especially the case in the Luangwa River, where the closed season for breeding has been unofficially lifted, in reaction to the fact that there is no 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, following regulations on the Zimbabwean side of the river. Closed season dates are, however, not synchronised – largely defeating the purpose of their introduction. In addition, the effectiveness of closing the fishing is questionable, considering the poor monitoring on the Zambian side of the river. Closed season fishing at night by young boys is common in Zambia. Smoking of the fish is then done during the day in the bushes to avoid attracting the attention of fisheries authorities.

Access to Fisheries in Mozambique

The situation in Mozambique is similar to that in Zambia. Any citizen can obtain a fishing licence from the Tchuma Tchato office close to the Zambezi River, and enforcement of fishing regulations is very poor. No provisions have been made for a closed breeding season. The TT has tried to implement community-based fisheries management, but fishing is uncontrolled and dominated by non-locals. A significant proportion of these non-locals are Zambians who have access to better markets as far afield as Lusaka and the Copperbelt. Their ability to speak the local language, Chikunda, ensures that non-locals easily blend with local fishermen and thus go unnoticed by fisheries authorities. Close friendship ties and relations with the locals can also guarantee non-locals access to the river area. Contract fishing is also common, with fish traders paying 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 around 40 per cent to the state, some 20 per cent to the local community, about 10 per cent to the district, and roughly 20 per cent to the TT programme.

Access to Fisheries in Zimbabwe

Unlike the Zambian and Mozambican authorities, the Parks and Wildlife Management Authority (PWMA) in Zimbabwe sanctions only fishing with lines and hooks – with the exception of one cooperative, which practises commercial fishing using gill nets. This renders fishing a non-lucrative industry for non-locals – who come only in small numbers, and only to buy fish. Some Zimbabweans have reacted to this situation by getting cross-border relatives or friends to allow them access to fisheries on the Luangwa, or on the Zambian and Mozambican sides of the Zambezi River. Non-licensed fishing is also practised, though to a lesser extent than on the Zambian and Mozambican sides.

Gender in Fishing

In all these communities, fishing is regarded as a male activity. Women reported fear of crocodiles as a major deterrent, although women reportedly fished with mosquito nets in ephemeral ponds and rivers after floods. 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 for household consumption is under the control of the women, but the income made by women and girls 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 portions of this income. Fisheries income, as dictated by male decisions, therefore, may or may not improve the wellbeing of the household.

It is worth noting, however, that the status of women in the area cannot be generalised. 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.

Benefit Sharing

Determinants of Benefit Sharing

Respondents in the study area were asked for their preferred forms of benefit from wildlife and fisheries revenue. The results, classified according to the different groups, are outlined in Table 7.3.

Table 7.3. Preferred benefit forms based on gender

Group	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 in 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 remained similar over a long period. Thus the provision of broad-based benefits from wildlife and fisheries revenue in the form of schools, boreholes and grinding mills were preferred by most members of the communities. Other commonly preferred benefits included clinics and irrigation equipment. These broad-based benefits, 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 have developed, however, their needs have changed. In all three countries involved in this study, the various ethnic and gender groups now have different ideas about the forms in which benefits from natural resources should come. This diversity of preference poses a problem for the implementation of a TBNRM initiative.

Benefit programmes have attempted to provide for different needs by diversifying the forms of benefits. Some community members have no alternative livelihood strategies, so community development projects do not cater for their immediate needs. These people are likely to prefer to receive household benefits from the revenue derived from natural resource use. This is the case, for example, for the elderly who cannot engage in farming, fishing or hunting. In addition, different situations have resulted in different benefits being offered. In Zimbabwe, for example, households received food during drought years. This has not been possible in Zambia and Mozambique – the major problem being that the revenue from fisheries and wildlife is too little to cater for the direct needs of households, given the population and the wide area over which these benefits would need to be spread.

Resource Tenure and Property Rights

Once the natural resources within a TBNRM area are established as belonging to the inhabitants of that area, the issues of prior informed consent (PIC) and mutually agreed terms (MAT) become especially relevant and critically insecure. A major limitation for PIC and MAT is the issue of resource tenure. Under current policies and legal frameworks, the PIC of local communities is not required for resource exploitation. This means that resource use is not on mutually agreed terms. In none of the three countries do the communities have *de jure* or *de facto* resource ownership. Rights of withdrawal (for hunting, fishing, or the use of water) can be acquired through licensing procedures. Communities find these procedures prohibitively expensive, especially for wildlife resources whose use is dominated by private tour operators. While communities are consulted through CBNRM programmes, management rights are held ultimately by state agencies. Quota setting is a good example; communities set quotas but wildlife authorities dictate the final figures.

Exclusion rights belong to the state in Zambia and Mozambique, and to the RDC in Zimbabwe, and alienation rights belong to the state in all three countries. Thus, by statutory law, local communities are relegated

to being merely authorised entrants into the wildlife estate and, at best, only “authorised users” for fisheries and water. To implement the principles of PIC and MAT, the communities should be the proprietors of the natural resources found within their settlements, thus having, at least, the rights of management and exclusion. Ownership of land is critical for communities to benefit from land-based resources. It also allows access to water resources for commercial purposes since land title is required for water permits. The communal land tenure system is the main constraint for some ZIMOZA communities as regards exhibiting proprietorship status of land-based resources. In Zimbabwe, for example, it is possible to devolve wildlife resource ownership to landowners, but communal dwellers cannot be afforded the same rights; these are instead given to the RDC.

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, but, even with such a lease, landholders would still be subject to normal licensing procedures for the use of wildlife and fisheries resources in these areas. With no legal rights to natural resources, the communities have no basis on which to demand revenue sharing or for negotiating how exploitation of the resources should be carried out. As has already been stated, the prior informed consent of local communities is not legally required for resource utilisation, which cannot then be regarded as occurring on mutually agreed terms. The recommended “devolution of resource tenure” is a strategic national policy under which communities’ capacity to benefit from TBNRM would be enhanced. This recommendation is, however, 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 privilege of information on the quantity of local resources or the purposes for which it is extracted.

For fisheries, this is because even the authorities do not have this information, owing to resource constraints. For wildlife resources, however, there is great disparity in the information available to the authorities and private safari tour operators on the one hand, and the local communities on the other. Local communities in all three countries reported a lack of knowledge about the quotas granted to private tour operators and also regarding the amount of revenue accruing from hunting activities. The absence of such information limits the negotiating power of local communities. Because they are little aware of the value of their resources, local communities cannot 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 both the local communities and the fisheries authorities.

Locals cannot participate effectively in NRM unless this vital information is availed to them and their involvement in management is encouraged. Resource valuation presents another problem for acquiring prior informed consent from local resource users.

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 could then directly receive and manage revenue accruing from the use of natural resources, on behalf of their constituent communities.
- The 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 interacting and sharing information. There is therefore a need to strengthen community social communication

mechanisms. This should incorporate strategies for improving access to information by all the gender groups.

- If transboundary development and conservation takes a rights-based approach seriously, then the communities must be educated about these rights. This is especially true for women, many of whom lack basic education. Providing education for women would 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 that the relevant rights be enshrined in formal institutional arrangements, such as policies, laws and constitutions. In the absence of formal ABS legislation, a pragmatic approach would be for TBNRM programmes to establish local-level interest negotiating forums for the various stakeholders and the different genders.
- There is a need for joint management plans for fisheries, water and wildlife between the three countries. These could form the basis for establishing a 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 a need for resource tenure reform. Communities should have the right (enshrined in law) to manage local resources 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 at community level and dividends at 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 would improve resource access and control by previously marginalised groups. Gardens, for example, are a preferred form of benefit suggested by women. They exercise more control over food crop production, the land and water on which these gardens are established as well as the crops that are grown, than they do over other natural resources. In Zimbabwe, according to Nemarundwe (2003), supporting rural women's gardens increases their access to and control of communal land – thereby improving their social standing.
- Commercial resource use should be balanced with community resource use. Men currently control commercial use, which generates income, whereas non-commercial activities for household consumption are usually the preserve of women.
- While pricing can be done with few impediments for fisheries and wildlife because they have “real” markets, the valuation of water resources is more problematic. It is therefore necessary that governments develop sound natural resource valuation techniques that are acceptable to the people, wildlife, fisheries and water authorities in all three countries.

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8

Conclusion and Recommendations

Fiona Flintan and Shibus Tedla

This final chapter first discusses a number of ways that conservation and development organisations 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 are also discussed, and ways of responding to some of these challenges are suggested. The chapter ends by summarising the conclusions raised by the different contributors to this book, and gives a set of recommendations for mainstreaming gender in NRM and NRM-focused research.

Mainstreaming of women and gender

As some of these contributions have shown, where attempts have been made to include “women” or “gender” within programmes, projects, and activities, organisations have tended to take one of two different approaches: either women-focused projects or gender-mainstreaming (gender-focused).

Women-focused Projects

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

- Women are “missing out” on male-focused activities.
- When women’s immediate needs (practical needs) are met, they will have more time to invest in conservation practices.

- If women's income increases through diversification of livelihoods, then they will be able to rely less on natural resources.
- Natural resources can often be replaced by alternatives.
- Population growth and pressure is a primary cause of environmental degradation.
- Women are more easily mobilised and more credit worthy, and have a greater entrepreneurial spirit than men.

Women-focused projects often include income-generating activities, credit and savings projects, health provisions, and family planning. Though these projects may provide some short-term benefits, in general they fail to tackle deeply embedded and complex gender inequalities (Flintan 2003). As Watson (2005:5) describes, though some projects "balance" their field-based activities with men and income-generation activities with women, the connection of these projects 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 addressed properly. Since gender also concerns men, even women's projects need to find a way of getting men to take part in the struggle to reverse gender inequities in society.
- 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 be able to rely less on natural resources.

- Women can be more involved in decision-making processes aimed at protecting the environment and its sustainable use.
- Improving women's status will reduce fertility, resulting in less population pressure on resources.
- If women feel more secure about their property rights, they will invest more time and energy in natural resource 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 can initiate change themselves.

Gender-focused projects include education and literacy programmes for women, skills and capacity building, support for women's collective action and groups, and mainstreaming of gender issues throughout conservation and development projects, such as Community-based Natural Resources Management (CBNRM), and Participatory Forest Management (PFM).

Dealing with social and gender inequalities

Tinkering on the surface of unequal gender relations will achieve little in the long term. If institutionalised and embedded inequalities are not addressed, no real change will be achieved. It may be necessary to promote small, immediate changes as a first step towards fulfilling project and/or management requirements, but this should be accompanied with a commitment to longer-term and deeper changes in which people take fuller control of their lives. The impact of such changes may not be seen within the project's lifetime, but that does not make it any less essential. Some of the positive aspects of gender-focused NRM projects and approaches are that gender-focused projects and approaches:

- Can increase community employment opportunities.
- Offer opportunities for women to be employed in traditional men's roles.
- Offer alternatives for natural-resource use.
- Generated long-term benefits through sustainable NRM.
- Generated indirect benefits, such as improved watersheds and climatic stability.
- Recognised the need to involve women because they are users of forest and other environments – not just because they are women.
- NRM usually recognises the heterogeneity of communities.
- New institutions created can promote women in decision-making processes.
- Increased number of women on forest and conservation committees.

And negative aspects of more gender-focused NRM projects are that:

- Often the jobs created are for males: jobs for women are mundane and labour intensive and entrench gender roles.
- Forestry and conservation is still dominated by men.
- Few women are educated, so they do not have the skills and knowledge needed for work in conservation and forestry.
- Income-generation projects fail to give adequate consideration or support to improving producers' access to markets.
- Alternative fuel projects are rarely successful: the benefits of moving to alternatives must take transfer costs into consideration when promoting new technologies. Often these transfer costs are too high to promote change.
- There is no history of community forestry in some parts of Africa.
- Traditional institutions that are supported by people opposed to modernisation can be biased against women.
- Forest agreements are often made with the heads of households – usually men.

- Women's attendance at meetings can be difficult, and non-participatory.
- Gender-awareness workshops are carried out in a "finger wagging", demeaning manner.
- Long-term investment is needed.
- Distribution of benefits is problematic.

Negative aspects would involve dealing with sensitive issues, such as power, control, and access to resources. The scope for improving livelihoods on the basis of NRM depends, amongst other things, on producers having secure tenure rights. If women are to be active and successful producers, then society and governments (through legislation) need to improve the security of women's land tenure rights. It will take time and support before women can play a truly participatory role in decision-making processes, and change likely needs a process of capacity and confidence building, as well as a more collective approach. It is thus necessary to look outside the traditional (male-dominated) institutions, which some people support for cultural reasons, to find the right forum for women to voice their concerns, needs and aspirations. This could happen within structures, such as women's associations (Muir 2006). Linkages would then have to be established between these groups and traditional decision-making bodies to ensure communication, inclusion, and so on.

Challenges to including gender in NRM research

Including gender in NRM research has proved highly challenging, as many of the contributions in this book 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 NRM initiatives. As a result, a number of challenges, including the following, can arise for researchers.

- Taking account of and understanding a range of diverse views and interests may be time-consuming and demand a

range of methodologies and tools. Additionally, researchers must be open to different perspectives – some of which may conflict with their own cherished ideas.

- With a large number of stakeholders, there are likely problems of power dynamics. Women often have less power, and, to include them, successful participatory and inclusive methods must be used. These take time to implement, and substantial investment in various resources and special skills, such as patience and persuasion.
- Working with people who may have divergent, or even conflicting, views could need mediation, negotiation, consensus building, and, possibly, conflict management.
- There may be issues of scale and representation. If there are a large number of stakeholders spread over a large geographical area, it will be important to ensure the representivity of any group included in the research. However, this needs to be considered in relation to the resources and time available: lack of availability of time or resources for the research may limit the achievement of a true, or even adequate, representation.

Integrated Nature of NRM and Environmental Issues

NRM and environmental issues are highly intertwined with matters, such as politics, economics, and of society. Carrying out research on NRM therefore requires that the following be taken into account.

- Interdisciplinary knowledge would be needed – either from an individual or from within the team.
- A recognition and exploration of linkages and complicated relations would probably be necessary. This would take more time than straightforward research would, and could divert the researcher from the main purpose of the research.
- Issues may be politically and socially sensitive. Therefore, it might be difficult or impossible to carry out the research as originally envisaged, e.g. on land issues, or power relations in the household.

- Assessing cause and effect might be difficult. There could be a number of factors that are difficult to separate out, and it could be almost impossible to predict change as so many “external” and “internal” factors can be influences. It is also difficult to have control over the process and results. A flexible and adaptive research process and project would be needed.

Nature of Rural Society

When carrying out research on natural resources and/or the environment, including social aspects, the researcher will most certainly have to work with and include rural communities. This offers challenges in itself, among which are the following.

- Logistical challenges of reaching rural communities, particularly those which are more isolated: there is a need for appropriate transport or a willingness to walk long distances, and to stay in villages with poor accommodation, food, etc. There is also a need to avoid potential biases, for example, due to weather (only carrying out research when it is good), geography (only visiting those communities that are close to a road or town), and people (only talking to those individuals who are easily accessed).
- Building up trust and rapport can be difficult: perhaps the researcher 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 about 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 may have to introduce innovations with patience. This will take time and resources, and misunderstanding can still pose a risk. 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 book used.

- People living in rural areas, 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 give up time to answer questions and/or attend meetings. The research may not be a priority for them; they have other more pressing things to do. How does one 'bring communities on board' so that they see the value of the research? Does one pay them for their time? How does one persuade them to risk action based on a research? It may need both time and skill to explain the research purpose and its potential benefits. Researchers must also be careful of not raising expectations of finding solutions to the respondents' problems.
- There is a need to move away from doing research *on* things and people and a shift towards carrying out research *with* and *for* people. This requires new research perspectives and practices, many of 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 organising often involves struggles over the definitions of rules and norms, and researchers may become entangled in, and perhaps distracted by, these struggles.
- It requires appropriate skills, experience and attitudes for outside facilitators to create an enabling environment for people to speak out, and to listen to them, as well as to guide the research in a direction that fulfils objectives but allows freedom for exploration of new areas. Researchers must beware of failing to listen and/or not showing appropriate respect.
- It should be remembered that information and knowledge are not value-free and researchers need to be aware that selective

choice of information or knowledge may empower some people while displace others. Knowledge is always socially constructed and often disputed. Analysis of 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 ask—as researchers, we need to be open to what we do not know as well as what we think we do know. We may only see part of the situation, overlook what is out of sight, and make generalisations based on too little information or too few informants.
- It may be particularly difficult to include women, e.g. for interviewing (see the special issues for consideration identified on next page).

Issues to keep in mind when interviewing women

- There may be opposition from husbands or from men in general.
- The interviewing team must include some women.
- The most suitable time and place for the interviews must be found and should take into account the needs of the women and their other commitments.
- Women may be more easily distracted, e.g. by their children.
- Women are more easily intimidated by strangers or new ideas and may be shy and not aware of the value of their knowledge and potential contributions.
- Strong women may dominate an interview.

- Often women are illiterate, or their understanding of modern/foreign terms may be rudimentary. This could point to a need for diagrammatic techniques – and for patience.
- Key informants in a community are usually men who dominate the public space; researchers therefore need to seek out key women informants.

Challenges within Environmental Research in Particular

As the chapters in this book have described, it is only recently that social issues, including gender, have been integrated successfully into environmental research. As noted, challenges still exist, due, at least, to the following factors.

- Among NRM researchers, and research managers, knowledge of and experience in social science research is limited.
- In most research efforts, social science components are generally not well integrated with natural science components. The contributions in this book show that such integration 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, unfortunately, 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 fails to go beyond mere descriptions – for example, of division of labour (roles of men and women) – and the “diagnostic” level. There is no analysis of more important and complex gender and social relations. There is a need to constantly create awareness of these issues.
- Short-term training has limited impact – training must be ongoing, dependent on action learning, and practically-based.

- Resources in the areas of social and gender analysis are difficult to come by, particularly that linked to environmental research.
- Networking has potential benefits but is not easy operationally. Again, this research programme has shown that it is possible.
- It is difficult and challenging to move from descriptive research and documentation to more explanatory research and writing.
- There is no proper institutional framework or institutional body responsible for working on social and gender aspects linked to environmental research. 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 the OSSREA programme from which this book is derived has overcome this, though it is important to ensure that networking and support continues.

Conclusions

The studies described in this book have confirmed many of the issues, problems, and factors introduced in Chapter 1, and have once again highlighted the necessity of taking a gender-sensitive approach if a fuller understanding of the context and impact of NRM 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 factors, such as time, wealth, level of education and the nature of production processes (Girma, Belisa, and Gudeta, this book; Macharia *et al.*, this book; Mawaya and Kalindekafe, this book). That is, it was the wealthier (so perhaps in a better position to take risks), better

educated, and younger farmers who tended to be more open to trying out new technologies and supporting change. Naigaga, Kyangwa, and Mugidde (this book) clearly showed that different sections of the local communities utilised 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 fulfil their everyday needs.

The researches documented in this book, such as Macharia *et al.* stressed that households are not uniform decision-making units, but rather represent the 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. Girma, Belisa, and Gudeta; and Macharia *et al.* in their respective chapters in this book commended the need to avoid preconceived assumptions and stereotypes.

Gender divisions of labour have impacted on the different ways in which men and women relate to, and use, natural resources, based on their gender roles at household and community levels (Mawaya and Kalindekafe, this book). Macharia *et al.* (this book) showed in detail how gender, together with age, wealth and education, has a direct impact on the uptake of soil conservation methods. Further, Jibat, Belisa, and Gudeta (this book) stressed that unless gender relations are understood, technology transfer can be hampered. The particular case they dealt with was the transfer of the use 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 (hindered) the uptake of the new technology.

Gendered roles and responsibilities in NRM and agriculture influence men and women's needs, perceptions, and knowledge (Girma, Belisa, and Gudeta, this book). Often, others control the access to natural resources—for example, men controlling women's access, and local government controlling men's access. Thus, social divisions, such as age, status, and ethnicity were also important for defining who had access

to and power over the use of resources at community level rather than at household level (Mawaya and Kalindekafe, this book).

It has been shown that men and women will equally make the most of new livelihood opportunities based on the use of natural resources, albeit in different roles, and with different motivations, needs and access to these resources. For example, Rutaisire *et al.* (this book) highlighted the involvement of men and women in Uganda in the relatively new aquaculture industry. The only women who owned land or fishponds were widows or female *de facto* household heads; and, despite women's involvement, extension agents and others doing similar work still targeted men when providing information and input support. 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. This is especially so for women farmers who have only limited control over land and other natural resources.

All the chapters in this book stressed the existence of gender inequities in access to assets, means of production, and economic benefits from the sale of natural resources or agricultural goods, with women missing out and/or failing to benefit as much as men. Not only is such a situation accepted by men, it is also accepted by women themselves who are unable to see a way out and view such domination as a given (Girma, Belisa, and Gudeta, this book). The studies also confirmed men's domination of decision-making processes and bodies, both 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 to women's. Where women had organised themselves into a controlling body, for example in the wetlands of Uganda, men failed to respect them (Naigaga, Kyangwa, and Mugidde, this book).

Despite supporting evidence that women can play a central role in NRM, it is still assumed that the natural partners for NRM are male community members (Chishakwe, Tandi, and Musiwa, this book). For example, Mawaya and Kalindekafe described how, despite evidence of women being more involved than men in fishing from the ever-depleting river stocks, supplementary fish farming was directed almost

totally at men. Similarly, Rutaisire *et al.* (this book) describe how fishing extension services were almost always targeted solely at men, even though also women were involved in fish farming.

Often conservation and NRM focus on the development of institutions and organisations. More often than not, these are based on traditional male-dominated institutions and organisations, without concern for women's involvement or for alternatives that might better represent women. This is despite the fact that women tend to be more willing than men to form cooperatives and self-mobilise as a group to share responsibilities and resources, to provide support, and even to initiate change (Rutaisire *et al.* this book). Women associations, for example, offer a good opportunity as more formal institutions for involving women in conservation activities and provide space for a focus on women's interests and needs, but their contribution has yet to be fully recognised and utilised (Naigaga, Kyangwa, and Mugidde, this book). Though many of the studies in this book supported the development of women's groups and the notion of women working together to overcome the constraints they face, this approach is not always without problems. Rutaisire *et al.* (this book) described some of the problems a group of women faced in attempting to make use of fisheries opportunities.

The biases that women face tend to be both structural and attitudinal in nature, combined to be particularly enduring. Naigaga, Kyangwa, and Mugidde (this book) verified that those working for conservation organisations, including governmental ones, do not have much awareness of gender issues. Employment opportunities – for example, as conservation scouts or anti-poaching agents – are biased towards men (Chishakwe, Tandi, and Musiiwa, this book). The situation is aggravated by women's poor literacy levels, which results in a lack of input into project design and implementation.

Within NRM/PFM projects, there is rarely 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. Rarely is an adequate understanding of gender

issues within local communities created prior to intervention, design, and implementation. Project staff are usually male and often come from outside the local area. Therefore, they are less likely to have an awareness of local gender issues, and may lack rapport with and the trust of local communities. Their understanding is piece-meal and sometimes inconsistent. 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 being mainstreamed from the beginning. “Gender awareness raising” in local communities is carried out in a finger-wagging manner that achieves little positive impact.

Even though project and conservation organisations may consult with communities before making decisions about activities or interventions, because decision-making processes are dominated by men, these decisions or conclusions may be heavily biased – away from women’s positions. 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 that reflect only men’s needs and concerns are made.

Further, where gender issues are considered, they still tend to be seen as simple “gender relations” in terms of a potential or actual heterosexual relationship. The multilayered existence of gender relations is overlooked. Examples of such relations are that between an elder sister and her younger brother in the household, which is an important relation for intra-household resource allocation, and the relations between women themselves—for example in polygamous relationships. Alternatively, Mawaya and Kalindekafe (this book) showed 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 the conservation of resources.

Women tend to experience more negative impacts from environmental degradation than men do (Girma, Belisa, and Gudeta, this book; Mawaya and Kalindekafe, this book). Naigaga, Kyangwa, and Mugidde

(this book) showed that, although both men and women are at risk from pollutants in the wetland areas where they work or visit, women tend to be at greater risk – firstly because they are less aware of the potential dangers, and also because they are under greater pressure to continue utilising the wetland resources for everyday basic needs.

Naigaga, Kyangwa, and Mugidde (this book) highlighted the fact that women implemented conservation processes, upheld protecting laws and supported protecting activities in the wetland areas of Uganda more than men did, even though men had more knowledge of the laws. The women's group, Jinja Urban Wetland Women Organization (JUWVO), was very active in implementing maintenance and conservation processes in collaboration with government authorities, despite the lack of respect given to the organisation by local men and male wetland users. Nevertheless, women may often experience greater costs due to conservation processes, for example by having to spend more time protecting crops from wildlife, even though most wildlife-related jobs are given to men (Chishakwe, Tandi, and Musiiwa, this book).

All the studies argued that mainstream research, particularly scientific or natural resource research, still fails to include adequately the social aspects, including gender. All the authors have gone a long way in their attempts to overcome this and have ensured that, at least in the studies detailed here, gender has become a central focus. The value of this has been proved, as Naigaga, Kyangwa, and Mugidde (this book) conclude, "It is necessary to understand the general characteristics of the respondents in order to examine the general aspects of utilisation, access to and control of the wetland resources. 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

Lessons learnt from these studies and from other experiences have been used to develop the set of recommendations on how to move forward given below. It should be realised, however, that all these recommendations need to be adapted to the local context; what may work in one context may not work in another. The recommendations should thus be viewed only as guidelines, and more detailed, local, specific activities and support need to be provided.

1. A detailed gender analysis should be carried out, to ensure that all those involved in the project, in management processes, etc. have a clear and equal understanding of local gender relations and issues. Gender analyses should be ongoing, as part of overall strategies for monitoring and evaluation, and adaptive management; they should not be seen as one-off but should be used whenever questions, problems, etc. arise. Gender analyses should be carried out in a participatory manner as a shared learning process – an exploratory, even experimental, process – with communities and/or other actors.
2. A sound rationale for focusing on gender issues and the justification for promoting gender equality should be developed by projects and interventions, preferably before activities are designed, or at the very least prior to the start of activities. Among useful questions that can be asked are: To what degree does the project want to see gender inequalities changed? And, once considered, how are changes to be promoted? Who is to take 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 restrained approach and open up space for women themselves to initiate change? Can a focus on women and “women’s projects” be justified?
3. It is important to identify exactly which sections of society require assistance, and then to develop support that fits and is accepted by them. There must be a commitment from local groups, i.e. government and local communities (including the

women themselves) to supporting change. There needs to be true representation of communities, with specific attention to the 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, Tandi, and Musiiwa, this book).

4. It may be necessary to create gender and environmental awareness among environmental-management officials, as well as among men and women users and institutional users of different resources (Naigaga, Kyangwa, and Mugidde, this book). Without such commitment, empowerment and other social change will not 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.
5. Activities to support increased women's participation should be carried out hand in hand with addressing whatever basic inequalities there may exist within the local communities in terms of educational facilities, health care and property rights. Macharia *et al.* (this book) stressed a focus on women's access to and control of productive resources and benefits. Chishakwe, Tandi, and Musiiwa (this book) highlighted a rights-based approach, requiring as a prerequisite that rights be 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; in other words a twin-track process should be undertaken. Where traditional male-dominated institutions are being supported to manage NRM, it will probably 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.

6. Extension support for enterprises, 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 play in these productive systems, and the needs that they have for support (Rutaisire *et al.*, this book).
7. Women tend to feel more comfortable than men in forming cooperatives and in mobilising as a group to share responsibilities, provide support, and perhaps initiate change (Mawaya and Kalindekafe, this book). Women can see the advantage of "group power". Women's groups are often of an informal nature and may not be easy to locate. They can, however, provide a strong basis on which to build cooperation, and they provide a good entry point for mobilising women into a more formal or more active institution. Single-sex groups may prove advantageous, but the effects of such groups on gender relations should be monitored.
8. 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. Another positive factor can be a reliance on group power. By focusing on user groups as the means for mobilising 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 simply because they are women.
9. It is important to include the youth within NRM and environmental change: it is they who will be responsible for managing and protecting the environment in the future, so they 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 may be.

10. Commercial resource use should be balanced with community resource use. Often men control income-generating commercial use, and non-commercial activities for household use are usually the preserve of women (Chisakwe, Tandi, and Musiiwa, this book). Negotiation and conflict-resolution processes may be necessary to ensure that all actors are able to voice their needs, concerns, etc., and have an equal role in developing solutions and formulating conclusions.
11. There is a need to review gender policies so as to integrate gender analysis in NRM research. Amongst other things, this would result in wider adoption of new technologies in production systems (Macharia *et al.*; Girma, Belisa, and Gudeta, this book).
12. Adequate monitoring and adaptive management is needed. Change needs to be monitored, particularly change that involves social (attitudinal and cultural) change. Negative consequences as well as positive may occur, and action may be needed to mitigate changes negative consequences of change. 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).

The contributions presented in this book have attempted to overcome the challenges and incorporate gender into environmental research albeit within a separate though interlinked set of studies. Conservation and development interventions should, at the very least, attempt to “do no harm” to gender relations in communities involved in such interventions. More positively, the development process should always actively attempt to open up opportunities for greater gender-equitable social change. As described in the chapters of this book, many organisations (both NGOs and the government sector) are still struggling to determine how to achieve this. Research organisations continue to struggle to include gender, particularly within the more scientific disciplines, such as environmental and natural resource research: this book makes a modest contribution to this endeavour.

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