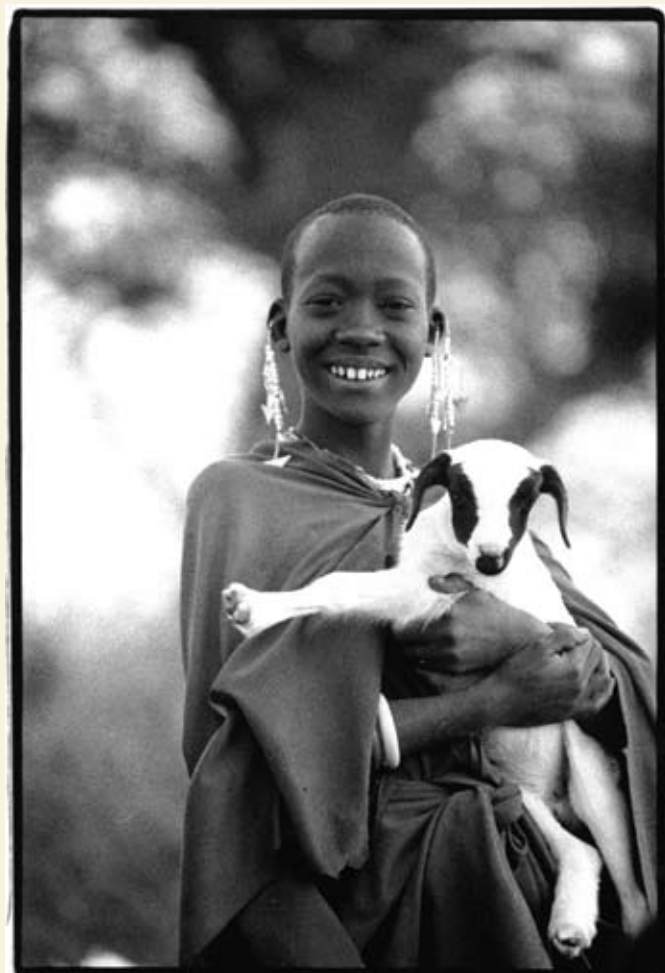


Integrating improved goat breeds with new varieties of sweetpotatoes and cassava in the agro-pastoral systems of Tanzania: A gendered analysis



Petra Saghir, Jemimah Njuki, Elizabeth Waithanji, Juliet Kariuki and Anna Sikira

ILRI

INTERNATIONAL
LIVESTOCK RESEARCH
INSTITUTE

Discussion Paper No. 21

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Integrating improved goat breeds with new varieties of sweetpotatoes and cassava in the agro-pastoral systems of Tanzania: A gendered analysis

Saghir, P.,¹ Njuki, J.,¹ Waithanji, E.,¹ Kariuki, J.¹ and Sikira, A.²

¹ ILRI (International Livestock Research Institute), Nairobi, Kenya

² Sokoine University of Agriculture, Tanzania

ILRI

INTERNATIONAL
LIVESTOCK RESEARCH
INSTITUTE

www.ilri.org



Canadian International
Development Agency

Agence canadienne de
développement international



IDRC | CRDI

International Development Research Centre
Centre de recherches pour le développement international






UNIVERSITY OF ALBERTA
DEPARTMENT OF RESOURCE ECONOMICS
AND ENVIRONMENTAL SOCIOLOGY

The International Livestock Research Institute (ILRI) works with partners worldwide to support the role livestock play in pathways out of poverty. ILRI research products help people in developing countries enhance their livestock-dependent livelihoods, health and environments through better livestock systems, health, productivity and marketing. ILRI is a member of the CGIAR Consortium of 15 research centres working for a food-secure future. ILRI has its headquarters in Nairobi, Kenya, a principal campus in Addis Ababa, Ethiopia, and other offices in southern and West Africa and South, Southeast and East Asia.

© 2012 International Livestock Research Institute (ILRI)



This publication is copyrighted by the International Livestock Research Institute (ILRI). It is licensed for use under the Creative Commons Attribution-Noncommercial-Share Alike 3.0 Unported License. To view this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/>. Unless otherwise noted, you are free to copy, duplicate, or reproduce, and distribute, display, or transmit any part of this publication or portions thereof without permission, and to make translations, adaptations, or other derivative works under the following conditions:

-  **ATTRIBUTION.** The work must be attributed, but not in any way that suggests endorsement by ILRI or the author(s)
-  **NON-COMMERCIAL.** This work may not be used for commercial purposes.
-  **SHARE ALIKE.** If this work is altered, transformed, or built upon, the resulting work must be distributed only under the same or similar license to this one.

NOTICE:

For any reuse or distribution, the license terms of this work must be made clear to others.

Any of the above conditions can be waived if permission is obtained from the copyright holder.

Nothing in this license impairs or restricts the author's moral rights.

Fair dealing and other rights are in no way affected by the above.

The parts used must not misrepresent the meaning of the publication. ILRI would appreciate being sent a copy of any materials in which text, photos etc. have been used.

Editing, design and layout—ILRI Editorial and Publishing Services, Addis Ababa, Ethiopia.

Cover photo—Maasai youth with goat kid (photo credit: ILRI/Stevie Mann).

ISBN: 92-9146-280-2

Citation: Saghir, P., Njuki, J., Waithanji, E., Kariuki, J. and Sikira, A. 2012. Integrating improved goat breeds with new varieties of sweetpotatoes and cassava in the agro-pastoral systems of Tanzania: A gendered analysis. ILRI Discussion Paper 21. Nairobi, Kenya: ILRI.

International Livestock Research Institute

P O Box 30709, Nairobi 00100, Kenya
Phone + 254 20 422 3000
Email ILRI-Kenya@cgiar.org

P O Box 5689, Addis Ababa, Ethiopia
Phone + 251 11 617 2000
Email ILRI-Ethiopia@cgiar.org

www.ilri.org

Contents

Tables	iv
Figures	v
Abbreviations and acronyms	vi
Acknowledgements	vii
Executive summary	viii
1 Introduction	1
2 Overview of livestock technology development and poverty reduction in Tanzania	3
2.1 Gender issues in crop and small livestock production	4
3 Methodology	6
3.1 Study locations and site characteristics	6
3.2 Key research questions and data collected by group discussions	8
3.3 Data analysis	8
4 Results	9
4.1 Description of community socio-economic characteristics	9
4.2 Gender issues in livestock production	21
4.3 Gender and root crop production	26
4.4 Perceptions towards introduction of dairy goats integration with root crops	28
4.5 Perceptions to introduction of dairy goats	30
5 Conclusion and recommendations	32
References	34

Tables

Table 1. Description of selected communities in Tanzania	7
Table 2. Key research questions and type of data collected	8
Table 3. Number of participants in group discussions and their distribution by gender from all study sites	8
Table 4. Community wealth indicators	10
Table 5. Coping strategies against food insecurity	15
Table 6. Community priority crop and livestock for food and income	18
Table 7. Goat ownership and decision-making	23

Figures

Figure 1. Map of Tanzania showing Kongwa and Mvomero districts	6
Figure 2. Proportion of community by wealth category	12
Figure 3. Proportion of household headship and constraints faced by household type	12
Figure 4. HIV/AIDS affected households vs. households who do not know their status	13
Figure 5. Main causes of food insecurity in the communities	15
Figure 6. Priority of on-farm livelihood activities by gender and wealth category	16
Figure 7. Priority of off-farm livelihood activities by wealth and gender	17
Figure 8. Institutional Venn Diagram showing relationships—Ihanda women group	19
Figure 9. Institutional Venn Diagram showing relationships—Wamiluhindo men’s group	19
Figure 10. Institutional Venn Diagram showing relationships—Kunke Mixed group	20
Figure 11. Institutional Venn Diagram showing relationships—Masinyeti women group	20
Figure 12. Objectives and advantages of keeping goats	23
Figure 13. Disadvantages of keeping goats	23

Abbreviations and acronyms

CGP	Crop and Goat Project
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
ILRI	International Livestock Research Institute
MAFS	Ministry of Agriculture and Food Security
M&E	Monitoring and Evaluation
MFEA	Ministry of Finance and Economic Affairs
MoAC	Ministry of Agriculture and Cooperatives
R&T	Root and Tuber
SHDDP	Southern Highlands Dairy Development Project
STIs	Sexually Transmitted Infections
SUA	Sokoine University of Agriculture
USAID	United States Aid for International Development
WFP	World Food Program

Acknowledgements

This discussion paper is based on the results of a qualitative analysis of Crop and Goat project (CGP) funded by International Development Research Centre (IDRC), Centre de Recherches pour le Development International (CRDI) and Canadian International Development Agency (CIDA) implemented by Sokoine University of Agriculture (SUA), Tanzania in partnership with University of Alberta (U of A) and International Livestock Research Institute (ILRI). We would like to acknowledge the support of SUA CGP management team, especially Faustin Lekule (PI), Sebastain Cheyambuga, Joyce Lyimo-Macha and Steven Nindi for their support, facilitating contacts, providing thoughtful feedback throughout this study. We are grateful to the extension officers at Mvomero district council—Bertha Dugange and Kongwa District council—Omary, A. Nkullo and community leaders who provided logistical support for the community data collection. The following people served as enumerators to gather the qualitative data from Swahili and transcribed it into English on which some of the analysis is based: Siwel Nyamba, Masatu Magafu and Devotha Kilevu all at SUA. Jusper Kiplimo made the maps. These people are acknowledged for their zeal, diligence and commitment to this study. We sincerely thank and acknowledge all the participants in this study who shared their time, their worlds and opinions with us in the hope that it will help to improve food security and human nutrition through an integrated program of dairy goat cross-breeding and goat milk production that is coupled with cassava and sweetpotato production for food and feed. We hope that the findings from this study regarding gender issues/stereotype show how such undercuts progress for the community.

This work was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada, and with the financial support of the Government of Canada provided through the Canadian International Development Agency (CIDA).

Executive summary

This paper focuses on analysing gender issues in livestock and root crop production. Qualitative data for the study was collected through gender disaggregated group discussions (GDs) in two districts, Mvomero and Kongwa in Tanzania. Data were collected from 4 communities representing the four villages—Wami Luhindo and Kunke in Mvomero, and Masinyeti and Ihanda in Kongwa respectively. A total of 12 GDs were conducted involving 224 men and women who participated in the GDs. The qualitative data were analysed descriptively and by using measures such as percentages, tables, pie, bar charts and Venn diagrams. The study found that men owned all the goats and made all goat related decisions unilaterally. Women were by far less likely than men to own not only goats, but also livestock in general. On management of goats, an important set of differences in activities is associated with gender as well as with age. Changing livelihood opportunities such as rural–urban migration were identified as a factor that influenced gender and goat management and this increases workload for women. On decision-making over goats, women have limited control over decisions on sale and use of incomes generated from sale of goats. Ownership of crops between men and women is quite distinct, and depends on the market prices of crops and yield of the crop they grow for cash. Men own cash crops or crops for cash whereas women own subsistence or food crops for home consumption. Wealth status had a direct relation with individual decision-making on crops, rich men and women decided on what crops to cultivate, whereas non-rich farmers worked on wealthy farmers' farms as casual labourers. Perceptions of women and men on the potential benefits of integrating root crops and goat varied. Men perceived value addition resulting from owning dairy goats and the attendant increase in income for them whereas women perceived change in status quo and increase workload resulting from stall goat management activities. Some participants explained that the anticipated increase in men's real income could come about either through men accessing women's income, or more commonly, women using their earnings to substitute men's expenditure on household needs and children's education. The study concluded that there are gender differences on perceived potential of integrating root crops and dairy goat production, as prevailing tradition may limit women's participation. The beneficiaries expressed the timeliness of CGP project and exhibited willingness to partake in the project and ensure equitable benefits for participants if participatory gender training and awareness is ensured at both the household and community level. The study recommended that investing in rigorous gender trainings for both women and men, to initially sensitize them on the importance of including both women and men in development projects and sustain their continued understanding of the importance of gender inclusive activities.

Keywords: Small stock, collective action, disequilibrium, food security, livelihoods

1 Introduction

Tanzania's agricultural potential varies by location according to variation in climatic and agro-ecological conditions. For the most part, however, this variation provides a high potential base for agricultural development in terms of livestock and crop production (Pauw and Thurlow 2010). Government statistics on agriculture in Tanzania indicate that over 80% of the country's population that lives in rural areas depends on crop and livestock production for their livelihoods (MAFS 2005). In 2005 agriculture contributed to about 50% of the national GDP, with crop production contributing 55% and livestock 30% of this GDP (ibid).

These statistics notwithstanding, the poverty level in Tanzania, measured in terms of income poverty—a combination of basic needs and food poverty, is still high—down to 34% in 2007 from 36% in 2000/2001, and higher in rural than urban areas (MFEA 2010). Developing the agriculture sector has the potential to decrease the poverty level from these high proportions because it could increase rural populations' incomes and nutrition. The potential for this increase is further enhanced by the increased demand for food in neighbouring countries, and globally, as the world population and food consumption increases. It has, however, been difficult to develop the agricultural sector in Tanzania because of several reasons, namely, poor infrastructure; inadequate extension services; poor agricultural production technologies; low value addition capacity; lack of appropriate financing mechanisms for agriculture; unreliable markets and unreasonable farm-gate prices; and environmental degradation (MFEA 2010).

In spite of the problems faced at combating poverty, studies have shown that small stock animals such as goats and root crops such as cassava and sweetpotatoes are the key integrated farming system within a community based system for smallholder farmers especially women under most productive system, as a way of enhancing food security and alleviating poverty (Sanni et al. 2007; ILRI 2008). Women are major contributors in the agricultural economy; their potential at alleviating poverty is limited by the constraints they face in livestock production and agricultural development as they pursue their livelihood activities.

Goats and crops have played key roles in the livelihood strategies of women and their households. For women, goats are relatively cheaper compared to other larger livestock such as cattle preferred by men, and are often the first asset acquired. Once acquired, goats become a valuable built-in capacity for asset growth, easy way to store cash for future needs and provide security to the family. Being small-sized animals, goats require a small initial outlay. Their small size, together with early maturity and prolific nature (kidding interval and high incidence of multiple births), makes them suitable for meeting subsistence needs for meat and milk, and their flock numbers can be restored more rapidly to generate income. Goats have higher survival rates under drought conditions compared to cattle. Similarly, cassava and sweetpotatoes are also drought tolerant, and are well known as security and last resort crops. Also, cassava and sweetpotatoes have been tagged as 'women's crops' and this pronouncement is likely to continue until the two crops become economically profitable crops in the world markets.

In 2011, a project on integrated dairy goat and cassava and sweetpotatoes was initiated in Mvomero and Kongwa districts of Tanzania with the aim of improving food and nutrition security of poor households. Given the importance of gender in both livestock and crop production, a qualitative assessment was carried out to inform the in-depth quantitative baseline survey of the communities being targeted for agricultural development in selected districts of Tanzania.

In their work, Amati and Parkins (2011) demonstrated interrelationships between crop and livestock production and gender, and that integrating the three is important for at least three reasons. First, domestic livestock (goat) and crops (cassava and sweetpotato) are important components of the agricultural sector in Tanzania (MoAC 1998) not only because they are viewed as beneficial livestock and food security crops, but also because the small stock are an asset that can be accumulated fairly quickly even by the disadvantaged, and especially women. Second, more attention is now being given to integrated small ruminant and crop farming systems, whereby cassava leaf meal and sweetpotato vines are an appropriate alternative protein and energy sources to conventional supplements for sheltered livestock feed (Ngi et al. 2006; Onia et al. 2010). Similarly, manure from dairy goats can be used to fertilize the cassava and sweetpotato crops resulting in a sustainable system of integrated farming. Third, studies have shown that integrated farming is more beneficial to women and the disadvantaged because these crops and dairy goat rearing are considered by most traditional patriarchal communities as appropriate for women (Sanni et al. 2007; Njuki et al. 2011). Additionally, establishing and managing small stock is cheaper than, say, cattle and the labour needed to handle dairy goats and crops is often readily available and provided by women who seem to prefer 'backyard' farming system that will not take them away from their other productive and reproductive roles.

Owing to the fact that women have different knowledge, access to, and control over resources, and different opportunities to participate in decisions regarding resource use and management (Sass 2001) from men, this study is paying great attention to the gendered differences in current livelihood strategies in order to establish how these differences are likely to play out in the intended project. The findings will enable the project implementers to put checks against interventions that are likely to impact women or men negatively, and especially those that will widen the gender nutrition, income and asset gap. Since past studies have noted that most programs and projects at development and implementation stages seldom seek the opinion of women, despite their greater contributions and roles in agriculture (FAO 2007; USAID 2009). The exclusion of women has made many past interventions most ineffective (World Bank 2008). The study reported here intends to overcome this challenge of excluding women from decision-making process.

This study addresses the very important issues of cultural stigmatization of empowering women and increasing their decision-making powers in four communities in Tanzania. The study identifies the factors that preclude women from benefitting in livelihood projects and accessing livelihood resources. This study will therefore integrate gender in all aspects of the integrated crop and goat farming project in order to ensure that project interventions meet the practical needs of men and women (IFAD 2002); to identify gender issues in livestock production, the current livestock ownership patterns, decision-making, division of labour and management (Njuki et al. 2011); gender issues in root crop production; and to design strategies that will result in the long term improvement in the status and opportunities for women and the disadvantaged, while supporting gender equitable approaches among stakeholders (United Nations 1999). The outcome will be people [men and women (sic)] who are empowered with the essential capabilities needed to improve nutritional status, food security and economic sustainability around the world, growing food (FAO 2009).

2 Overview of livestock technology development and poverty reduction in Tanzania

Despite the increased emphasis on crop and livestock technology production in Tanzania, few programs have focused on integrating root and tuber crops with small ruminants like goats. This is surprising because crops like sweetpotato and cassava are among the most important root and tuber crops grown by farmers and goats are present in most rural households in Tanzania. Cassava, is the most important root and tuber (R&T) crop grown by farmers in Tanzania, followed by sweetpotatoes (Kapinga et al. 1995) with production volumes of 2,102 838 MT and 216 478 MT respectively (National Bureau of Statistics 2003). Both crops have the ability to provide a food security buffer during hunger periods, are sometimes considered as a famine reserve foods (Kapinga et al. 1995), and can be successfully grown in semi-arid areas (Dahniya 1994; Kapinga et al. 1995). Several studies have highlighted advantages of growing root crops. Cultivating root crops such as sweetpotato and cassava has the added value of being both food for humans and feed for animals (dual-purpose) making these crops desirable to produce in areas where land availability is declining (Leon-Velarde 2000; Nyaata et al. 2000). Combined, these factors imply that the integration of root and tuber crops with livestock production may yield positive outcomes, which are likely to benefit poor smallholder livestock keepers, if investment in research on their production and marketing options could be translated into well-designed and implemented interventions.

According to the FAO Production Yearbook (1997), Tanzania contributes considerably to the production of goat milk in East Africa with 645,000 MT compared with 415,000 MT in Sudan and 93 MT in Kenya and Ethiopia. However, one of the main limitations to goat productivity, particularly for local breeds in Tanzania, is poor nutrition (Tolera et al. 2000). Small scale farmers experience low growth rates and low milk production as a result (Chenyambuga et al. 2004). Consequently, projects that aim at increasing dairy goat productivity, food security and human nutrition through the introduction of improved breeds and enhanced feed management practices have a heavy presence in eastern African countries. For example, interventions in Tanzania include 'The Improvement of Newala Goat Research Project' under the Small Ruminant Collaborative Research Support Group (SR-CRSP) (Mtenga and Kifaro 1992), which resulted in improved milk yields and improved knowledge and use of high quality feeds (Matambuki and Salum 1999).

While examples from Tanzania of integrated R&T and goat interventions are difficult to identify, utilization of sweetpotato and cassava residues for supplementary livestock feeding has been well documented as a successful option for improving livestock nutrition, and in particular, goat nutrition. In various regions of Tanzania, feeding dairy livestock with sweetpotato foliage and similar crop residues is an important common practice, particularly in the Northern areas where zero-grazing dairy operations are common (Kuoko et al. 1993 in Kapinga et al. 1995; Ingratubun et al. 2000).

Livestock diets and the quality of manure are improved as a result of consuming the high nutrient content of the sweetpotato vines (Nyaata et al. 2000; Lenné and Thomas 2006; Dung et al. 2010). Also, a sweetpotato

vine diet is particularly rich in protein and has been found to support growth, especially if combined with certain low quality grasses (Aregheore 2004). Small ruminants can also be fed cassava tuberous roots, foliage, peel and residue obtained after processing cassava. These tubers and peels are good sources of energy which, when fortified, promote positive and high proliferation in sheep and goats (Smith 1992; Iyayi and Tewe 1994). A protein-rich goat diet is, therefore, likely to contribute considerably to goat productivity, which may have various poverty-reduction outcomes like nutritional welfare of small holder goat keeper households (Semenye et al. 1989; Smith 1992).

All these advantages notwithstanding, the utilization of cassava as a livestock feed and its adoption in the livestock feeding systems of Tanzania has been very low. One of the main reasons behind this low uptake is because it is produced in dry areas where intensive livestock production is not practiced. Further, the high price of cassava makes its use as a livestock feed uneconomical (Lekule and Sarwatt cited in Hahn 1992). The combination of both cassava and sweetpotato as nutrient rich food for goat production is likely to be confronted with some of these challenges.

2.1 Gender issues in crop and small livestock production

Men and women have different needs and capabilities, and they experience development interventions differently. Much of the information on benefits from livestock and other agriculture based economic development projects is documented for the household as a unit, with no consideration of how the benefits are distributed between the individuals constituting the household. Most gender specific information, especially on differences between women and men, is anecdotal, as much of it is hard to measure using conventional quantitative methods and hard to explain owing to the complex underlying discourses and their equally complex causal relations. Feminist scholarship has shown that households are realms of unequal gender relations and spaces of contestation and negotiations for gender power and control (Agarwal 1997; Narayan et al. 2000). Owing to the complexities of these relations, scientists shy away from them and stick to defining issues such as roles and responsibilities and other measurable attributes without quite explaining the differences they show (Deere and Doss 2006).

Studies have shown that women do not exercise control over large animals in any system (Valdivia 2001; FAO 2006). For the most part, the income from small-scale production involving small animals such as poultry and small ruminants has long been reported to be negligible compared to those realized from larger livestock such as cattle (Kryger et al. 2008; Staal et al. 2008). The concern whether or not women take decisions over livestock assets is based on an understanding that the social impacts of derived remunerations from these assets vary depending on which gender has control. Women are reputed to use profits from assets over which they have control for meeting household food security needs, including education and health of household members (FAO 2011). Based on this understanding, supporting women in their livestock activities is expected to not only ensure sustainable livelihoods, equality and economic growth, but also guarantee transparent ripple effect on household members while contributing at the same time to meeting the wider demand for livestock products.

Gender equality and economic growth are linked. The economic deficit—in terms of efficiency and well-being—documented in the poor nations can, in part, be attributed to gender inequality (Kelkar 2009). Hunger, a poverty indicator of particular significance, is clearly associated with gender disparities in education and health (von Grebmer et al. 2009). For agricultural interventions in mixed crop livestock systems to contribute to poverty reduction, access to and ownership of land, as well as control over income from land is considered critical. In Tanzania women especially in rural areas are estimated to provide 60% of food production (Tanzania National Website in Amati and Parkins 2011). Though they are the main producers of cash crops they are unable to own land, and have little control over incomes generated through agricultural activities.

Women's assets are usually fewer and of a lower value than men's assets. Studies on asset development over a 20 year period in Northern Nigeria showed that women's assets grew more slowly than men's, thus continuing to widen the gender asset gap (Dillon and Quinones 2011). The differences in asset growth were associated with the types of assets held—men held cattle and women held jewellery—and the market price dynamics. The price dynamics also determined who owned the assets, with men owning more of the rapidly appreciating value assets than women (ibid). The price dynamics also influence factors like crop and livestock ownership, whereby men own highly valued cash crops and cattle and rapidly claim ownership of traditionally women's crops and livestock and livestock products when their production is commercialized and markets formalized (Njuki et al. 2011; Waithanji et al. 2012). Because of these dynamics, it is necessary to make conceptual distinctions between projects that seek to reduce poverty by enhancing productivity and those that seek to empower women as they require different strategies (Rao 2005).

For example, several years after the Southern Highlands Dairy Development Project (SHDDP) in Tanzania introduced European cattle breeds to smallholder farmers, an intra-household level analysis revealed differences in men's and women's dairying and livelihood objectives. Women complained that increased milk production as a result of the project did not equate to increased nutritional outcomes, especially when men utilized additional incomes on alcohol in spite of women's increased labour activities (Mkenda-Mugittu 2003). Numerous livestock development interventions that have overlooked gendered resource access issues have resulted in negative effects on women (Kristjanson et al. 2010). Effective poverty targeting, therefore, can ensure short-term material benefits for the poor without enhancing gender equality (Rao 2005).

Studies have documented relationships between livestock, gender and economic growth. The subject most commonly discussed is the gender difference in work roles within different systems of livestock production. Women's economic importance are repeatedly acknowledged momentarily for their work with small animals such as goats, sheep and poultry, especially in backyard farming systems (Kryger et al. 2008), and in milk production (FAO 2006). Little detailed gender disaggregated information that are available, tends to be unsubstantiated and is often supported by little empirical evidence (Bravo-Baumann 2000).

Various sources document similar findings from cassava and sweetpotato studies in Tanzania. Nweke and Enete (1999) found that across 131 cassava farming households in Tanzania, women in female headed households were more likely to own crop fields due to the fewer number of adult males living in these households. This finding is partly demonstrated by results from Njuki et al. (2011) which found that across 237 households, male headed households owned and cultivated significantly larger sizes of land than female headed households. Studies on sweetpotato farming show that in some regions of Tanzania, women are 100 percent responsible for planting, weeding, processing and storing sweetpotato, whereas men are responsible for 70 percent of rural area marketing (Kapinga et al. 1995), which implies a certain level of control over incomes generated from farming activities.

Similar results have been found with regards to cassava farming where Nkwe's (1994 cited in IFAD and FAO 2005) study in SSA found a positive correlation between the proportion of cassava sold by small scale producers and the proportion of fields owned by women. Male farmers in Tanzania have been found to control most of the profits from commercialized cassava sales, while women control incomes from small cassava sales often using the money to buy household goods and support their children's education (Curran and Cook 2009).

As long as gender disparity persists, nations will continue to grapple with ways to overcome poverty. Policies to address these persistent gender inequalities, their causes and the nuances associated with the causes, that deprive women ownership and control of assets must be put in place. In order for this to happen, gender disparities have to be identified and documented and impacts of interventions measured in terms of these disparities. A starting point for establishing these disparities is putting in place a gender integrated M&E framework for conducting *ex ante* studies and *ex post* evaluations and impact assessments. This is what this project is attempting to do.

3 Methodology

3.1 Study locations and site characteristics

Qualitative data for the study were collected through gender disaggregated group discussion (GDs) between September 12th and 17th 2011 in two districts, Mvomero and Kongwa. Mvomero, is located in the South–East and Kongwa in the central part of Tanzania (Figure 1). The villages in each district were purposively selected according to several characteristics, namely; market access, proportion of female headed households and households affected by HIV/AIDS, food security patterns, interest and willingness to participate. Data were collected from four communities representing the four villages—Wami Luhindo and Kunke in Mvomero, and Masinyeti and Ihanda in Kongwa. Male and female participants between the ages of 15–76 years were gathered from the selected communities for the group discussions at the community square by the extension officers in the two districts. These groups comprised people from various socio-economic statuses. Each group discussion lasted for two and half hours. Communities from these sites practiced mixed crop–livestock systems and their farms had high agricultural potential (Table 1).

Figure 1. Map of Tanzania showing Kongwa and Mvomero districts

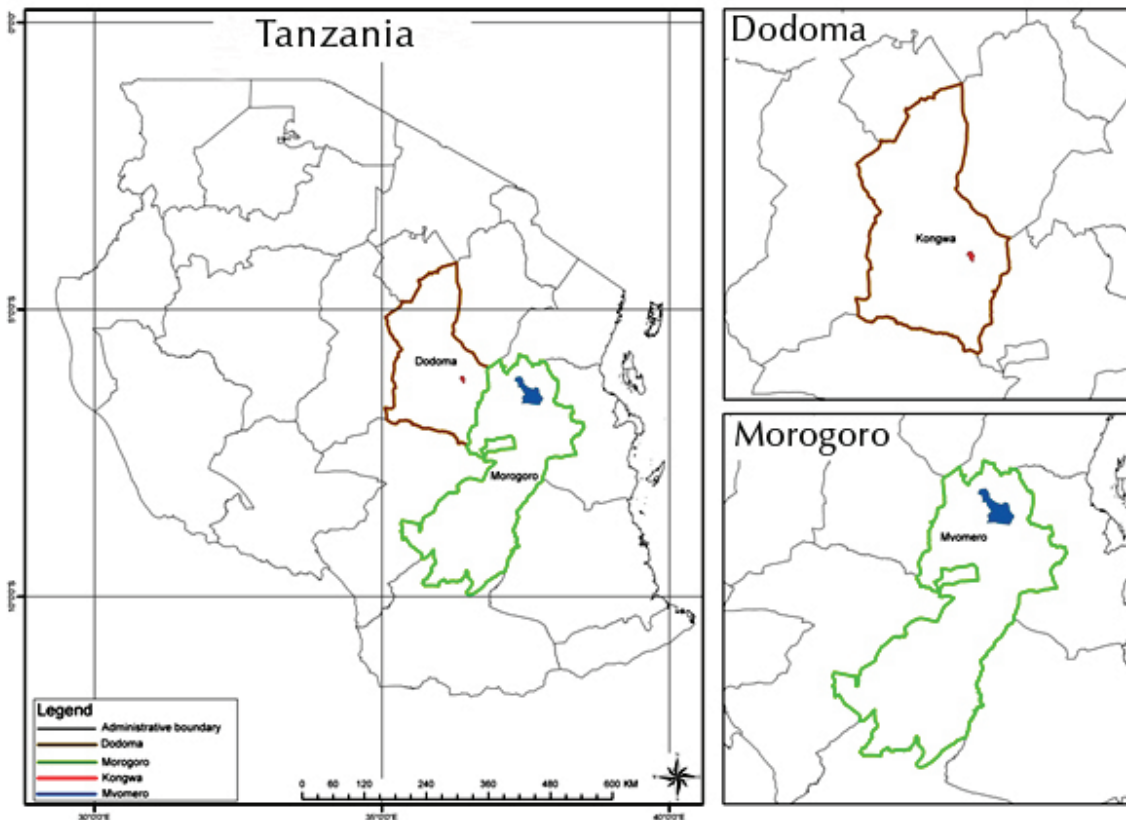


Table 1. Description of selected communities in Tanzania

District	Community	Agricultural potential	Production system	Market access	Major enterprise		
					Cash crops	Food crops	Livestock
Mvomero	1. Wamiluhindo	Good and fertile land for agriculture and livestock keeping available	Rainfed subsistence farming	Domestic markets available but unreliable for agricultural products	Cotton, coffee, Simsim, sunflower, sugarcane, bananas and vegetables	Maize, rice, millet, cassava, pulses and arrow roots	Cattle, indigenous and dairy goats, sheep and chicken
	Mixed crop livestock		Agro pastoralism				
Kongwa	1. Masinyeti	Good and fertile land for agriculture and livestock keeping available	Rainfed subsistence farming	Domestic markets available but unreliable for agricultural products	Groundnuts, Simsim, sunflower, castor oil seeds, and cashew nuts	Maize, rice, millet, cassava, legumes and sweetpotatoes	Cattle, indigenous and dairy goats sheep chicken and donkeys
	Mixed crop livestock		Agro pastoralism				

According to Tanzania Population Census (2002), the total human population in Mvomero is 260,525 of which males are 131,159 and females are 129,376. There are 58,314 households; average household size of 4.5 persons and average population growth rate of 2.6 % (per year). The main ethnic groups in Mvomero District council are Luguru, Kagulu, Zigua and Nguu. Luguru group dominates Mgeta and Mlali wards. Kaguru Zigua and Nguu dominate Mvomero and Turiani wards. More than 80% of adult population in Mvomero district primarily earns their livelihood from agriculture through subsistence production. Average individual annual income (per capita income) in 2007/08 for the district was approximately 337,000 Tanzania shilling (TZS) (on 10 April 2012, USD 1 = TZS 1581.02). There are about 58,314 farming households in the district. Of the 142,155 farmers, 70,833 are females. There are 84 extension officers in the district. This gives the ratio of 1:1700 of extension agents to farmers. The local markets for crops in Mvomero are—Nyandira, Mlali Kibaoni/Langali, Kipera, Makuyu, Lusanga na Kichangani. The district is endowed with abundant livestock resources ranging from cattle, goats and donkeys among others. Pastoralists number about 2,534 (Mvomero District Council). The district has two livestock markets—Melela and Mikongenin, which are not easily accessible because of their distance to other villages.

Most of the roads network systems are passable throughout the year except Mvomero-Ndole-Kibati road (79.68 km) which is not passable during rain seasons. Mvomero district has good land and rivers for irrigation. The area which can be used for irrigation is more than 20,579 Ha. The area which is being used for irrigation currently is only 5,213 Ha.

Kongwa District has a total area of 4041 km² of which almost 80 per cent of the area is suitable for agricultural farming. Livestock keeping is the second major economic activity after crop production practiced in the district. Based on population and household census of 2002 and annual growth rate of 2.4 per cent, the estimated current population of the district is 295,476. Males are 146,799 and females are 148,677. The number of households is 60,301 with an average size of 4.9 persons. Number of farming households are 54,271 which almost equal to 90% of the total number of households. Labour force engaged in agricultural farming is 89.84 per cent (of which 85.12 per cent are farmers and 4.72 per cent are livestock keepers). The district has three major farming systems: crop, pastoral and mixed farming systems. The district has one international centre at Kibaigwa where business people from different parts of East and Central Africa come to buy grains (mainly maize). Livestock are being sold through primary livestock markets.

3.2 Key research questions and data collected by group discussions

Qualitative data were collected from gender disaggregated and mixed—men and women—Group Discussions (GDs). Information was ordered using tools like ranking, proportion pilling and Venn diagrams. The aim was to have two gender-disaggregated and one mixed GDs in each village in order to capture differences in men’s and women’s perceptions of various aspects of goat production and root and tuber crops. The objective of disaggregating GDs by gender was to enable women to speak freely and represent their views without the influence of men, and the men to report their views freely in the absence of women, as well as to identify and compare any fundamental differences in men’s and women’s responses.

Questions on community characteristics, livelihood strategies and food security, gender issues in livestock production, gender and root crop production, perception to introduction of dairy goats and perception on the root crop–dairy goat integration were asked to both men and women participants. The main questions asked and the specific data collected are detailed in Table 2.

Table 2. Key research questions and type of data collected

Research question	Tool and type of data collected
What is the current status of goat production and how may this be altered upon the introduction of improved dairy goats? What is the labour use in goat production? Who owns and manages goats? How would livelihoods change if dairy goats were introduced?	GD Checklist Group Discussion
What is the role of sweetpotato and cassava in improving food security and nutrition? What are the uses of and benefits from cassava and sweetpotato production? What is the status of food security and what coping mechanisms are employed?	GD Checklist Group discussion
What are the priority foods and income security based activities (on and off farm)?	Ranking
Are they conducted by men, women or both, and other household members? Are they young, old or of all ages? Who and what type of households are most likely to be engaged in each of these activities?	Group discussion Proportion pilling
What institutional mechanisms have the potential to increase women’s and other vulnerable groups’ benefits from integrated farming and characterizing households into wealth and household heads categories?	Venn Diagram Group discussion

With assistance from the districts agricultural extension officers and community leaders, a total of 12 GDs were conducted involving 224 men and women who participated in the GDs as shown in Table 3.

Table 3: Number of participants in group discussions and their distribution by gender from all study sites

Site	District	Number of FGDs	Total number of women in women-only GDs	Total number of men in men-only GDs	Number of men to women in mixed group FGDs
Wami Luhindo	Mvomero	3	18	20	11:12 (23)
Kunke	Mvomero	3	17	14	10:13 (23)
Masinyeti	Kongwa	3	22	20	09:11(20)
Ihanda	Kongwa	3	15	16	05:11(16)

3.3 Data analysis

The qualitative data were analysed descriptively and by using measures such as percentages, tables, pie, bar charts, proportion pilling and Venn diagram. Verbal quotes of discussants were also used to lay more emphasis on discussants’ perceptions on the study objectives.

4 Results

4.1 Description of community socio-economic characteristics

Measuring community socio-economic characteristics enables researchers in development practice to compare *ex ante* and *ex post* situations, the relevance of a development intervention to a community and predict the likelihood of success of the intervention. It is necessary to understand the gendered perceptions of the factors which determine wealth distribution (IIED 1988). Community socio-economic stratification to measure vulnerabilities often requires the use of proxy or indirect indicators to approximate the phenomena being described, as phenomena such as vulnerability do not have a direct measure or sign. Examples of proxy indicators include health, governance, political rights, literacy and economic well-being. These proxy indicators have been used to develop a social vulnerability index for countries in Africa (Adger and Vincent 2005). In this study, we stratified the communities by wealth and household type, in terms of headship, wealth status and affliction by HIV/AIDS, and developed proxy indicators, with community members, for each stratification category.

Community wealth

A ranking activity and proportion pilling were carried out to identify what participants use to measure wealth relating to their local socio-economic indicators of wealth. The indicators identified by participants were based on several criteria: ownership of cattle, availability of food, and possession of modern building with burnt bricks, farm size and means of transport. Participants were able to classify their community into three wealth groups: rich, average and poor.

The most commonly used wealth indicators by the three wealth strata of the community in the selected communities were possession of land and livestock. Women appeared to assign more weight on land than livestock, and men assigned more weight to livestock than land (Table 4). The priority placed on land before livestock as indicator of wealth by women may suggest that women recognize land as a main vehicle to livelihood security through investing, accumulating wealth, and transferring it between generations (Sabates-Wheeler 2006). Without land, it is hard to accumulate livestock. Land for women is a scarce asset, but to most men, it is almost a given birth right when it is available to the family. Men may, therefore, take land as inherently present and perceive wealth mainly as accumulating livestock on this land.

In addition to livestock ownership, possession of a modern house/building with burnt bricks was a highly placed indicator of wealth given by men (Table 4). Evidently, a fancy brick house is a display of wealth popular with men in Tanzania.

Table 4. Community wealth indicators

Wealth indicators in community (for the rich)	Tally			Total	Rank
	M	W	Mx		
Large numbers of livestock (cattle/goats)	IIII	III	II	10	1st
Possession of modern building (with burned bricks)	IIII		III	7	2nd
Large farm (30 acres sugarcane; 10 acres maize; 10 acres rice)	II	III	II	7	2nd
Means of transport (cars/motorbike)	II	II	II	6	4th
Wealth indicators in community (average wealth)	Tally			Total	Rank
	M	W	Mx		
Medium sized farm (1–1.5 acres sugarcane; 3 acres rice; 3 acres maize)	II	IIII	II	8	1st
Owens few livestock	II	III	II	7	2nd
Owens bicycle	I	II	I	4	3rd
Large thatched roofed houses/Mud houses with iron roof	II		II	4	3rd
Wealth indicators in community (poor)	Tally			Total	Rank
	M	W	Mx		
Owens few or no livestock	III	III	I	7	1st
Employed as labourers	II	III	I	6	2nd
Poor condition of house (dilapidated roof/thatched roof)	IIII		II	6	2nd
Little or no land	II	II	I	5	3rd

Key: M= men only; W=women only; and Mx=mixed men and women group

Men are more likely than women to invest in bulky expenditures on physical assets such as housing (Chaiken 1993), whereas women are likely to perceive house ownership as 'culturally' the domain of men because in order to build a house, one has to own land and it is easier for men to own land than women.

As explained by participants in the men's group at Wamiluhindo:

'Wealthy individuals from higher income groups tend to raise large livestock such as cattle for sale; average wealth individuals choose to raise small livestock such as goats owing to the small investment required and the quick returns to investment; while poor individuals cannot afford to have three square meals per day, let alone raise livestock' (men group GD-Wamiluhindo).

Explaining why women considered land and livestock as indicators of wealth because they are aware of the socio-economic importance placed on both. Women explained that socio-economic constraints are gender neutral, and that they did not own cattle and land because of socio-cultural factors and gender stereotyping of roles for both men and women. Men's ownership rights of land and livestock are near guaranteed by a universal set of inheritance rules that are gender biased rooted in patriarchal kinship system. Yisehak (2008) observed similar dynamics of women non-ownership of land and livestock in his study on gender responsibility in smallholder mixed crops livestock production system in Jimma zone, South Ethiopia. All the groups explained that women could own livestock if they were single or through inheritance. Participants explained that if married women asserted their inheritance rights by claiming ownership and control over the livestock they inherited, they risked social ostracism from the kinfolk's networks, which they drew their daily survival needs from. Similar findings were found in Uganda where stigmatization was associated with asset acquisition or claim for control (Oluka et al. 2004). Other communities such as Northern Kenya are evolving from this oppressive state of women and some women are now freely inheriting land, livestock and other assets (Lesorogol et al. 2011)— an indication that culture, often evoked to resist change, can change (Ekong 2003). As explained:

'Even if a woman is given a chicken or a goat by her parents as bride wealth, she cannot own it. It belongs to her husband. The decision on whether to sell inherited livestock is made by her husband. The wife and everything she owns belong to her husband dead or alive.'— Male group-Kunke

Indeed, men see such property as belonging to them. Explained by a man in Ihanda:

‘The only dairy goat (buck) I have ever owned came from my father in-law as gift to his daughter when I married her. It belonged to me because she is my wife, I own my wife and everything she has belongs to me’ (Male participant in mixed group—lhanda)

For women of average wealth, land was mentioned more frequently than livestock as an indicator of wealth, whereas men of average wealth mentioned land, livestock and type of house equally and most frequently as indicators of wealth. The dynamics of ownership and control among the rich and average wealth categories of community are likely to be similar since the same resources are contested.

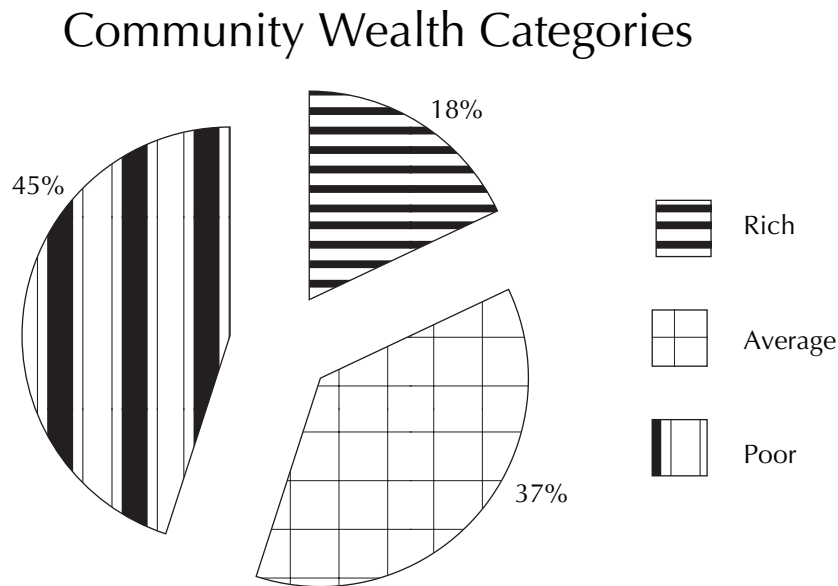
For the poor, livestock were identified as prominent indicators of wealth followed by employment as labourers. Land lost prominence as an indicator of wealth for this group. This is because the poor do not own much land; many do not have livestock and depend on their ability to work as labourers in order to survive. Asked why they never seemed to get out of poverty by working hard as labourers, saving money, buying livestock and selling the livestock to buy land, both men and women groups from all study sites, which contained people from all three wealth categories, said that it was impossible for most poor to come out of poverty.

The reasons given by the participants for this immobility were that their labour was required during the planting season, which was also during the hunger gap. They worked in the land of the rich and medium wealth people for food leaving their fields for later. They often planted their food late in the season and risked losing their crops to climatic variations—which are very common. Their harvest was always very poor because of small land size, late planting and lack of inputs such as good quality seeds and fertilizer. The little food they harvested got finished quickly and they borrowed food from the better-off community members. They paid for this food with double the portion of food they borrowed or half the market labour charges if they chose to pay for it with labour. They were therefore, in a permanent and increasing state of food and labour debt. This cycle of poverty for the vulnerable is summed up by Kimani and Kombo (2010) as dehumanizing condition that erodes human rights of the affected women and men. It subjects the affected to a state of powerlessness, hopelessness, and lack of self-esteem, confidence, and integrity, leading to a situation of multidimensional vulnerability.

The disparity in wealth reported among the rich and medium wealth categories of people did not come out for the poor in the two districts, probably because there were fewer resources to contest control over. Asking about control of income generated from wage labour, and food harvested, albeit little, may shed a light on the presence or absence, and the nature of disparity in wealth by gender.

Classifying the households in the communities into wealth categories, the majority of the households (45%) were classified as poor, 37% as average and 18% as rich (Figure 2).

Figure 2. Proportion of community by wealth category

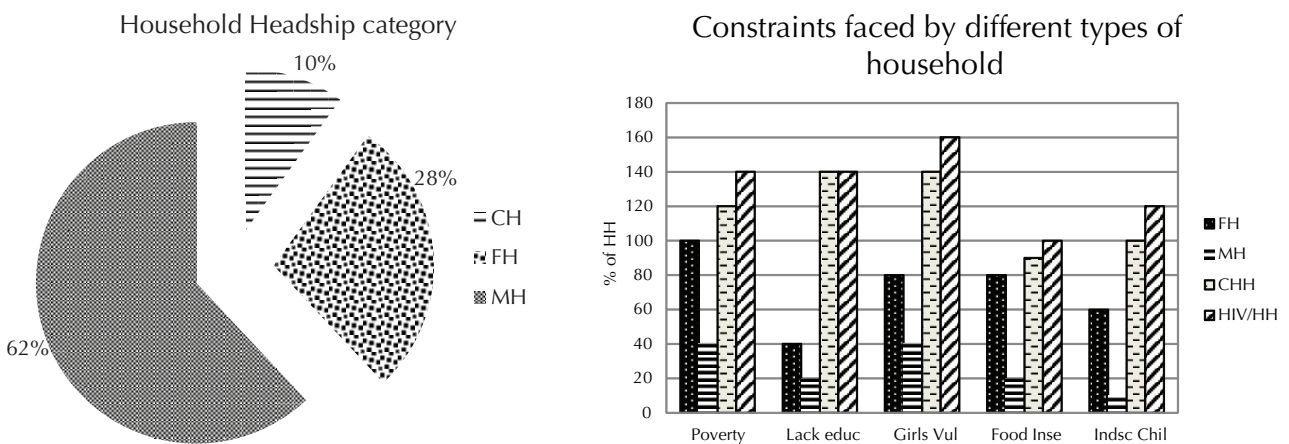


Household headship

Household headship was used as a proxy indicator for the classification of the community in terms of capabilities and vulnerability in the study sites. In this study we adopted Blaikie et al. (1994) pressure and release (PAR) and access to resources (ARM) models of vulnerability. We argue that certain process such as becoming orphaned for children; a single parent, particularly widowhood and teenage motherhood, for women; and becoming affected by HIV/AIDS exposed these categories of the community members to hazards such as food scarcity more than other community members.

Qualitative results were pooled from the study sites to get the proportional household headship. On average, about 62% of overall households were male headed, 28% were female headed and 10% were child headed (Figure 3).

Figure 3. Proportion of household headship and constraints faced by household type

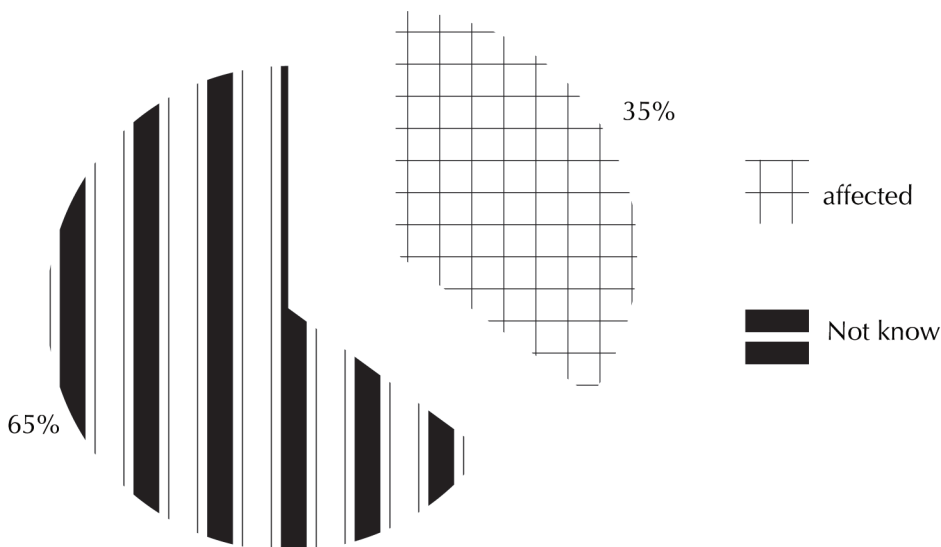


The female and child headed households and households affected by HIV were more vulnerable than male headed households to: i) poverty, ii) food insecurity iii) having undisciplined children. For female household head, participants in the mixed group explained that males in these benefited more within the household because cultural gender norms encouraged preferential treatment of, and skewed sharing formula of household resources in favour of men. Children headed HH were the most vulnerable according to most discussants. In spite of the resistance of discussants to acknowledging the presence of HIV affected households in the community, HIV affected HHs were identified as the second most vulnerable [to children HH] in terms of poverty and food insecurity, whereas female headed HHs were second most constrained in terms of child indiscipline and vulnerability of girls. Discussions about HIV/AIDs are complex and communities are defensive because the disease is still associated with bad morals and no community wants to label itself as immoral. There was reluctance in all FGDs to answer this question.

The explanation for this attitude may not be far from the dominance of sexual transmission of HIV and the consequence that frequent episodes of Sexually Transmitted Infections (STIs) facilitate HIV transmission are largely shroud in stigma of promiscuity attached to HIV infection even when people are not sexually infected (Caldwell et al. 1992). These create conscious and open denial of the severity of the diseases and total dissociation from infected persons within the community.

The status of HIV of most people in the study areas is unclear as explained by participants because people hardly go for testing unless the signs are clearly indicative of the disease. The data presented here was obtained within those constraints and was obtained only after persuasion and convincing discussants that there was no longer reason to deny the disease as that does not make it go away. Discussants always claimed that the disease was brought to them by people from neighbouring villages and we agreed. On average, 35% of the population is affected by HIV/AIDS and 65% do not know their status (Figure 4).

Figure 4. HIV/AIDS affected households vs. households who do not know their status



Households provide infrastructure within which important family decisions between men, women and children take place. Important decisions may involve how family members can pool their resources to manage livelihood related shocks, illnesses and stresses (Agarwal 1997). Constraints to managing risks are however more likely to be experienced differently depending on household headship and the type of constraint faced (Quisumbing et al. 2001). Failure to take into consideration household types, their vulnerabilities and the constraints they face may lead to the disadvantaged households' exclusion from benefitting from project activities.

Common food security and livelihood strategies

Food availability, accessibility, food security and household well-being are closely linked. An analysis of community food security and livelihood strategies is an essential prerequisite to understanding how a project will affect, or be affected by, various households' status and wellbeing of individual households within the community. The state of being food insecure directly contributes to the damaging of livelihoods through malnutrition, morbidity and mortality (Young et al. 2001). The goal of assessing the food security of a community may, therefore, be in order to establish ways of minimizing nutritional risks and saving lives in the short term, and supporting livelihoods in the long term.

Among the indicators of food insecurity used in the communities selected and mentioned by men, women and mixed groups included the following: when more people than usual engage in casual labour to make money for household needs instead of working in their own fields during planting season; when there is an increase in begging for food; and when notable shifts in nutritional status take place such as a reduction in household food consumption and malnutrition of vulnerable groups. At household level, lack of signs of a recent fire in the hearth was also considered to be indicative of food scarcity in the household. According to the discussants, the status of food insecurity in their communities was severe with 10–70% of the households being food insecure. Children were most affected, followed by women, especially from children and female headed households and households affected by HIV/AIDS.

Comparatively, households in the selected communities, except Kunke, had adequate food between May and October. Kunke had adequate food between June and September. During the period of food adequacy, many crops such as maize, rice, sorghum and fruits were harvested. Food production declined between November and April, which was when farmers became busy preparing land and planting for the next season. Generally, women GDs reported fewer months of food adequacy than men. Varied food insecurity exists and persists in the communities owing to multiple underlying factors that are closely related. Poverty might be the main underlying cause of food insecurity as it enhances the vulnerability of households to drought, scarcity of inputs, and unavailability of the affected poor to cultivate and plant their own food as they work for other households. The consequences of the foregoing combination of events include food scarcity due to poor or a total lack of harvest. The main causes of food insecurity given by GD participants are shown in figure 5.

Seasonal coping strategies employed by both men and women in the two selected districts during the period of food insecurity are not different. These include: changing consumption patterns such as reducing the ration and frequency of food consumed per day by members of the family; temporary migration of people without food to urban centres to search for employment as casual labourers instead of working in their own fields during the planting season; and massive sale of small livestock like goats at reduced prices to meet immediate family needs.

These strategies have immediate and long term detrimental effect on households—such as malnutrition, loss of timely planting opportunities on own farm and lack of income to buy back sold assets, lack of food and farm inputs for the next season, and loss of livestock assets—that inevitably increase their vulnerability because they lack the ability to recover. Individuals are also engaged in protecting consumption by borrowing and begging for food to repay later during times of food security at 100% interest rate, begging for food from relatives and neighbours, exchanging other items for food, and diversifying their consumption patterns by eating less food or less nutritious food (Table 5).

Figure 5. Main causes of food insecurity in the communities

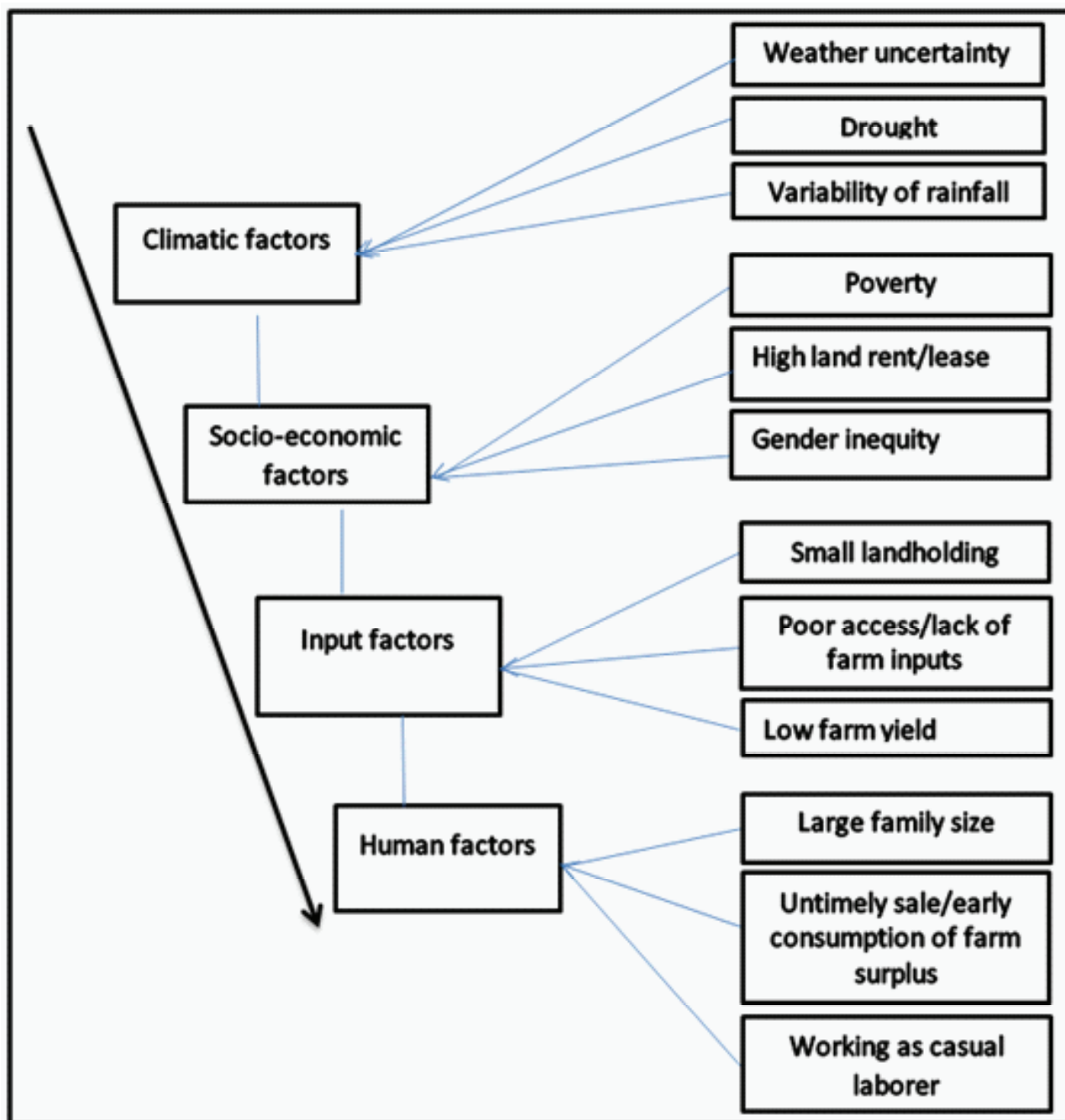


Table 5. Coping strategies against food insecurity

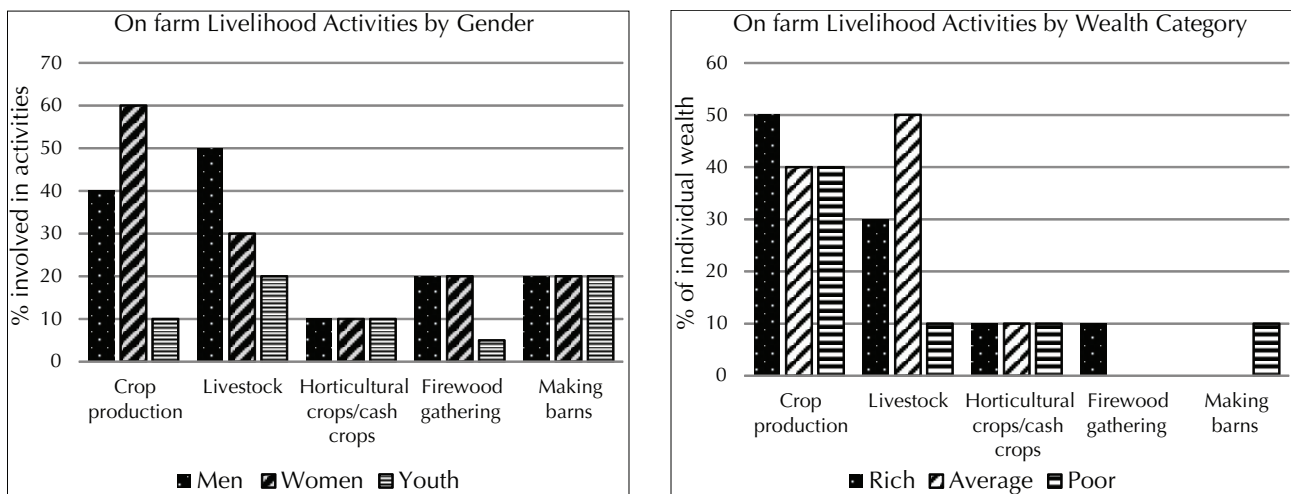
Individuals	Households	Communities
Engagement in casual labour	Work as casual labourers	Government relief food to elders, orphans and disabled persons
Borrow food from neighbours	Sell livestock to buy grains	The rest of the community gets food at subsidized prices
Sell livestock/vegetables to buy food	Borrow food to pay back at 100% interest rate of its worth	Those who have, give those who beg
Sell personal assets	Give feeding priority to children	
Beg for food	Sell off household assets	

Livelihood strategies

Priority crops for food and income varied substantially with location. Men and women's in the two selected districts priorities were sometimes different, and at other times similar.

Results from this study showed that a majority of participants, from average to poor wealth households diversified their productive activities to encompass a range of on and off-farm productive activities. As indicated by participants, strategies to ensure the survival of the household in times of stress/shock that are available to women differ from those available for men. Crops were mostly produced by rich women and livestock were raised mostly by men of rich and average wealth. The youth were least involved in farm activities (Figure 6).

Figure 6. Priority of on farm livelihood activities by gender and wealth category



Horticulture was practiced only by few community members, perhaps because it is a new venture. It was, nevertheless, being practiced by all genders of all wealth categories equally.

A gendered dimension of livelihood strategies is important to consider because clear gender roles in purchase, access to and management of resources and coping strategies; as well as gender divisions in terms of access to food outside of the home exist (Young et al. 2001).

Off-farm livelihood activities are shown in Figure 7. Casual labour was the most practiced off farm activity by predominantly poor men and women within the districts selected. The rich do not engage in casual labour, sale of charcoal and firewood and brick-making. Small businesses were the second most practiced off-farm activity and were practiced equally by men and women and more by the average wealth people than the rich. Women were engaged in casual labour and selling charcoal and firewood mainly for the off farm livelihood activities. Men were engaged in brick-making, small businesses like having grocery stores and sale of grains. Comparatively and as explained by participants, the profit margins for these activities differed greatly: gathering and selling firewood by women provided a low profit margin compared to large-trading in grains such as maize and paddy engaged by men. It is notable, then that women's off farm activities, though more diverse, tend to be less remunerative than men's.

Figure 7. Priority off-farm Livelihood activities by Wealth and Gender



Priority crop and livestock products for food income

In Wami-Luhindo, men and women’s priorities for both crop and livestock-based food were very different. Men did seem to be able to separate products for food and for income, whereas women seemed to use almost all crops for food and income because they also have responsibilities for food provision in the household. Women’s commitment to their household welfare was exemplified with remarks by a woman in Wamiluhindo:

‘When my children see no fire in the hearth and there is no pot burbling on it as they come back from school, they continually look in to my eyes with hunger, I cannot afford to sit idle and not look for food for them wherever possible. I don’t mind going hungry just as long as my family has food to eat (Mixed group, Wamiluhindo)

In Masinyeti, maize and sorghum was the priority crops for both food and income for both men and women. In Kunke, maize was the priority food crop for men and women alike, but sugarcane was the priority income crop for men while maize remained the priority income crop for women. In Ihanda, women and men had different livestock priorities for income and food. Men’s priority food livestock was chicken whereas women’s priority livestock based food was milk.

Table 6. Community priority crop and livestock for food and income

Community	Rank	Men				Women			
		Food	Income	Food	Income	Food	Income	Food	Income
1. Wamiluhindo	1	Rice	Rice	Cattle	Cattle	Maize	Simsim	Milk	Cattle
	2	Maize	Maize	Goats	Goats	Rice	Sunflower	Chicken	Goat
2. Masinyeti	1	Maize	Goats	Maize	Maize	Cattle	Maize	Chicken	Cattle
	2	Sorghum	Cattle	Sorghum	Sorghum	Pigs	Sorghum	Goat	Goats
3. Kunke	1	Maize	Sugarcane	Chicken and eggs	Cattle	Maize	Maize	Goats	Goats
	2	Rice	Simsim	Milk	Pigs	Rice	Rice	Cattle	Cattle
4. Ihanda	1	Maize	Maize	Chicken	Goat	Beans	Sunflower	Milk	Milk
	2	Sorghum	Sunflower	Goat	Chicken	Sorghum	Maize	Eggs	Eggs

The results from the two districts show that livestock such as cattle, goats, chicken and pigs play important roles in income generation and food security of both men and women in Tanzania. There is however a divergence in the importance of livestock across gender as women considered small stock such as goats and chicken as convertible assets that are easily traded to meet household’s immediate and future needs; whereas men

considered livestock such as cattle and goats as immediate source of large income. For men from study sites, livestock products including meat, milk, manure and hides are considered very important for generating income to procure farm inputs, build house and personal expenses.

Men considered livestock products such as meat, milk, manure and hides to be important mainly for income generation. Livestock, especially cattle and goats, were valued for reasons such as i) the social prestige associated with owning large numbers; ii) family nutrition; iii) sustaining traditional values and culture especially slaughter during festivals and as gifts to cement friendships; iv) bartered for grains during food scarcity and v) payment of dowry/bride wealth.

By looking at the food security and livelihood strategies of participants, CGP can better target vulnerable members in the communities such as women and children headed households and households affected by HIV/AIDS with appropriate interventions that will benefit them and not overwhelm them. As Chambers and Coney (1992) and Chambers (1998) explained, livelihoods are secure when households have secure ownership of or access to resources and income earning activities to offset risks, ease shocks and meet contingencies. The cultural and social dimensions of potential beneficiaries' coping strategies are, therefore, essential in identifying the most appropriate partners in any food security, income and assets intervention project.

Community cohesion/collective responsibilities

Participants explained community cohesion and collective responsibility that existed in their community which can be explained using Venn diagrams. A Venn diagram shows the key institutions and individuals in a community and their relationships; importance in decision-making and cooperation and highlight gaps and opportunities existing among groups that enhances collective action. These are drawn to help understand the current formal and informal institutions in the communities.

Prior to the acceptance of the presence of HIV/AIDS in communities, women were barely involved in public collective responsibilities. During the time of this study, 'women-centred' domestic groups existed in each site. Their roles were mainly to build local networks through which village residents—men, women and the youth—could be empowered to solve local problems such as access to social services like healthcare and education for underserved poor and vulnerable groups. Examples of women groups included '*Upendo*' (love) and '*Juhudi*' (community collective action) that took care of orphans and single mothers; '*Umoja*' (togetherness) for the people living with HIV/AIDS and '*Tupendane*' (let's love one another) for the elderly. These well-established women groups could serve as an entry point for projects intending to support certain categories of vulnerable communities collectively. Some successful group based projects include the *Upendo* group led HIV/AIDS care group from Kunke, central government led projects in Masinyeti and the Catholic Church led projects in Ihanda.

The institutional Venn diagrams in Figures 8, 9, 10 and 11 show inter-relationships among groups/organizations such as governmental, non-governmental (private) and local organizations that are internal or external to the communities. A group's position in the main square and/or out of it represents its role, with the group in the middle being really central to the functioning of the community, and one at the periphery having less influence in the community. The size of the circle/group and the thickness of arrows represent how big and important the linkages are in terms of power, effectiveness or relationships, which also represent the resources (natural, capital and human) available to the group.

There is strong alliance between the Catholic Church and both men and women group. External non-governmental organizations like CARE and World vision are making impact. There is much reliance on Village and district council for decision making.

Figure 8. Institutional Venn Diagram showing relationships—Ihanda women group

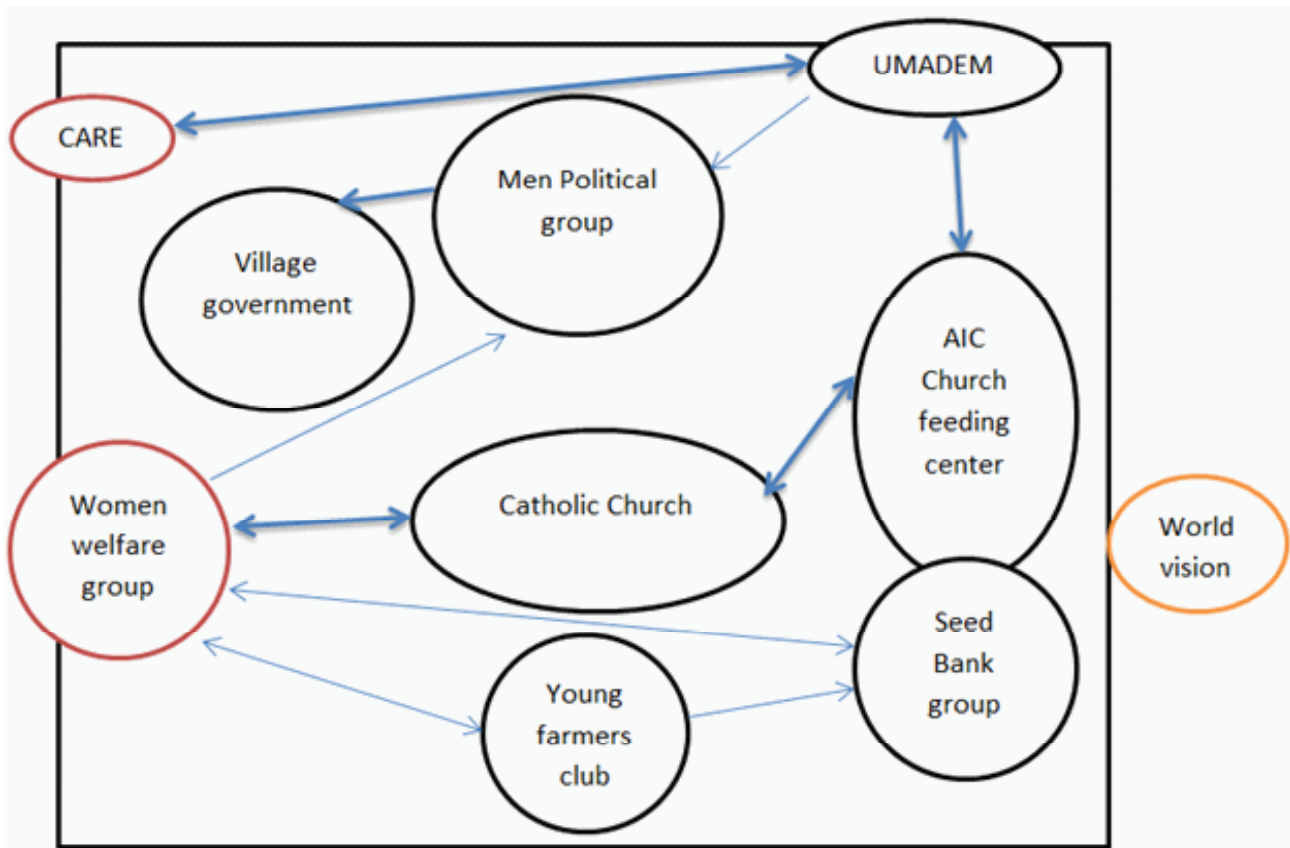
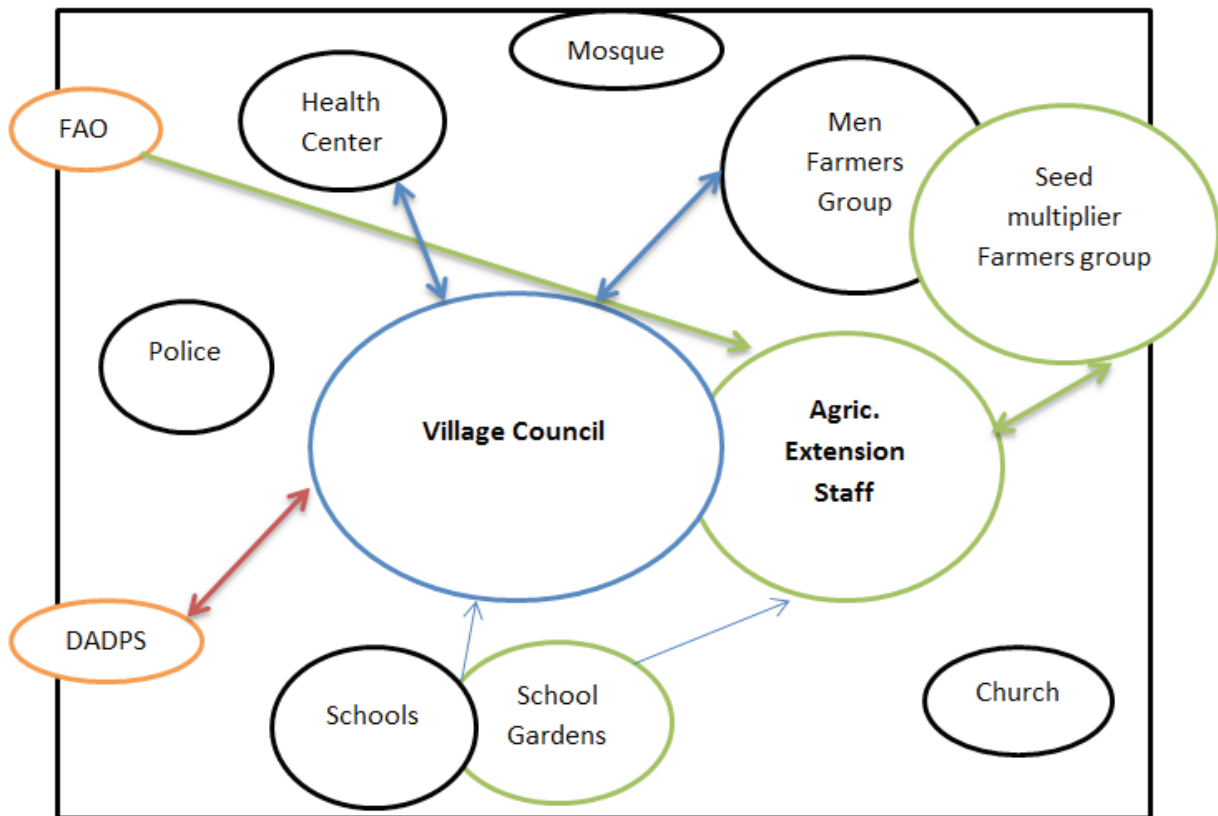
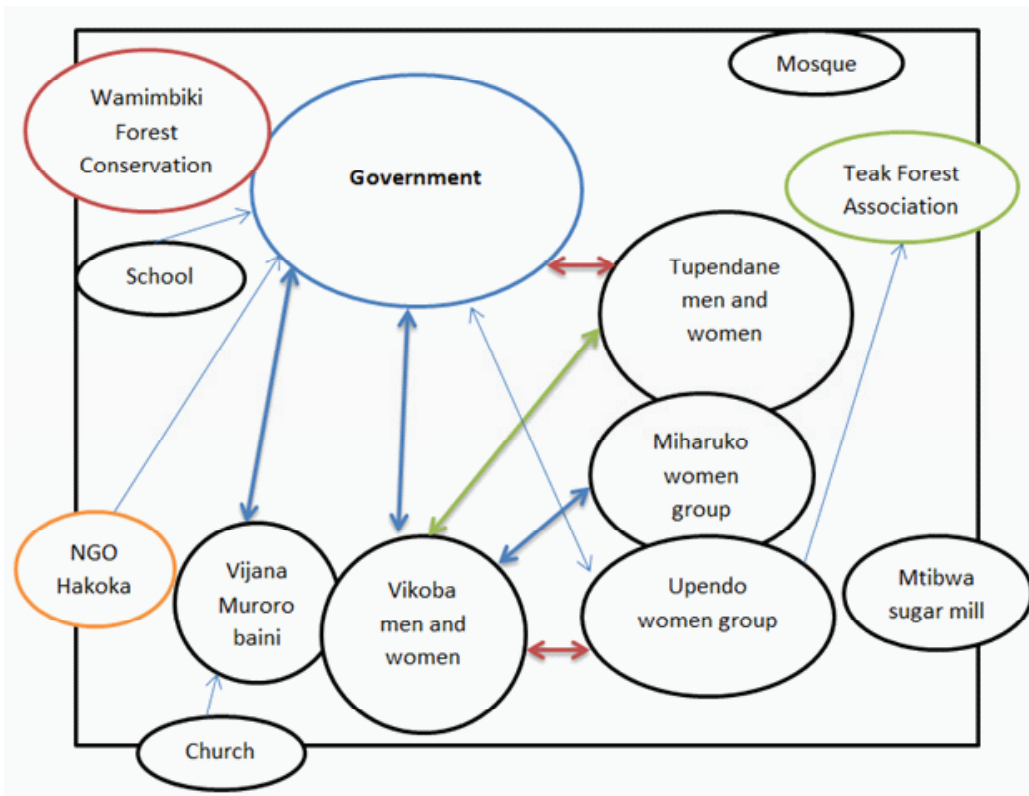


Figure 9. Institutional Venn Diagram showing relationships—Wamiluhindo men’s group



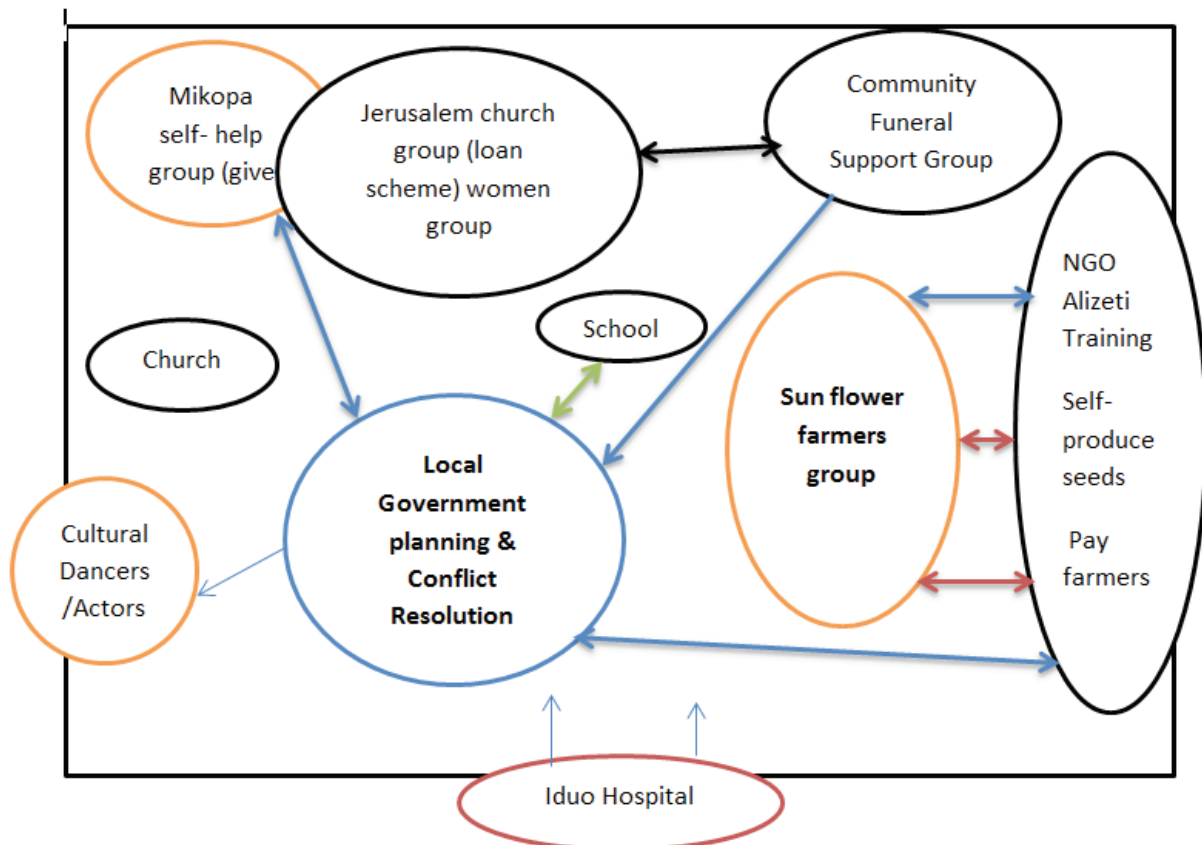
Village council is relied on to take most decisions. There is also strong influence of Agricultural Extension agents. Social groups reduce the financial burden of bereaved families. Savings and credit groups get revolving loans.

Figure 10. Institutional Venn Diagram showing relationships—Kunke Mixed group



All groups are self-help groups. It is difficult to work as a community collectively because group members are not committed. Upendo women group takes care of the HIV/AIDS persons

Figure 11. Institutional Venn Diagram showing relationships—Masinyeti women group



Village Government/District Council and extension officers have strong influence on groups. Men dominate the local and district council membership/groups, focusing on local, regional and neighbourhood politics. Women's presence was among special interest groups such as HIV/AIDS, funeral, wedding, and social event groups such as traditional dancers. Few women were members of farmers groups, which was surprising as women play a major role in farming. Nevertheless, farmers groups were mainly marketing groups for bulk producers of sugarcane for example, and women indicated that they do not market these commodities. In Masinyeti, the *Unguvu Kazi* (hard work) women farmers group is an example of a women's farmer group that can be used as an entry point into the community for a project targeting vulnerable groups. Some savings and credit groups associated with the CARE, a non-governmental organization (NGO), have women members and get revolving loans and support. These too could be a promising entry point as their sustenance is depended on their commitment to the microcredit project. The church too could serve as an entry point in places where there will be no controversy over religious affiliations. For example in Ihanda, the AIC church is linked to many organizations such as women, youth and farmer groups; and is also supporting a seed bank and feeding centre.

Women, men and mixed group explained that men occupied leadership positions even within women group; dominate 'male-dominated', local council and district council membership/groups that focused on local, regional and neighbourhood politics. In such groups, women are rarely permitted to be members. These traditional gendered roles in community responsibility and cohesion reflect patriarchal gendered expectations and gender hierarchies that specify roles and behaviour that reinforce dominant social attitudes about appropriate roles for both women and men (Bravo-Baumann 2000).

Project interventions that use pre-existing groups in communities are likely to succeed because these groups have *passed* the test of appropriateness in the community and their actions are likely to be acceptable. In any case, the group must know the community institutional rules that govern the community, including rules that can be flaunted and those that must be safeguarded for the groups continued survival. Community cohesion cannot be forcibly imposed by external agencies but has to be achieved through community members working together for the benefit of all (Catholic Education Service of England and Wales 2008). Increased community cohesion has direct and indirect impact such as helping increase personal security; allowing people, particularly vulnerable groups, more safety and opportunities to exercise and participate in social activities (Bray et al. 2005).

The rationale for collective action and community cohesion is because it offers the community an opportunity to serve as basis of economic take off of project and collectively develop their skills, mobilize resources, harmonize individuals socially and influence the nature and direction of development activities (Fernandez 1992; McCorkler 1992). Collective action is necessary in order to improve community production, income and hence the livelihood of the disadvantaged. This also enables development agencies to efficiently and effectively utilize limited resources to reach a larger audience compared to working with individuals (Galab and Rao 2003).

4.2 Gender issues in livestock production

Gender roles demarcate responsibilities between men and women in social and economic activities, ownership of, access to resources, and decision-making authority. It also shows constraints faced and benefit derived from such resources; what type of knowledge is appropriate for men and women, how and where this knowledge is acquired. This conditioning of gendered roles and responsibilities influences attitudes and thinking and over time makes it increasingly difficult to change the gender dynamics in relationships (IFAD 2000).

Ownership of and objectives for keeping livestock

There are no differences in ownership of goat between the two districts studied. In the two districts of Mvomero and Kongwa, men owned all the goats and made all goat related decisions unilaterally. In some situations, women kept money from goat sales but only men could decide on how to spend it. Men opted not to keep the money themselves because they might misuse it. Women from the study sites do not own goat but for some exceptions namely; as bride wealth, through inheritance and by direct purchase (which was uncommon). Even when women purchase goat, they do not own it due to the cultural affiliation persisting in the two districts. When asked to describe the distribution of goat ownership in the study sites, participants explained that women were by far less likely than men to own not only goats, but more generally, livestock.

A minority of groups from Mvomero district reported the existence of joint livestock ownership compared to rigid gender stereotype that existed on goat ownership in Kongwa district. Participants explained that women who were spouses from male headed households had no control over goats that they owned. For example, in the case of goats acquired through bride wealth, female discussants explained their inability to dispose of goats without consulting their husband. Women's control over goats is so constrained that even in the absence of their husbands, they were required to seek the consent to sell a goat from male relatives. The male relative would then defend the decision to sell the goat to the woman's husband upon his return. The culture of patriarchy and gender stereotype was cited as the main reason for women's poor ownership of goats in Tanzania. In some cases, men indicated that women could never own goats, explaining that goat ownership by men is a traditional right. As one man from a mixed group in Masinyeti expressed:

'Is the president of this country a woman or does the sun rise from west to the east? Women should wait until we have a female president in this country before they can own or make any decision on goats'

For some groups, there was however some willingness to consider goat ownership by women.

Men group in Kunke insisted that *'we need to be educated on how we make ownership of goats more gender equitable.'*

These results differ considerably with those from the few studies showing women's relatively high ownership of small stock, compared with large stock. For example, Valdivia (2001) found that small ruminants tended to be owned by women in Peru, Bolivia, Indonesia and Kenya. Participants also stated that women's limited rights over land ownership were the reason for their limited ownership of goats. As asked by a woman in Masinyeti

'How can a woman own livestock while the land she uses for grazing and cultivating belongs to her husband or other male relatives?'

The finding that women do not own goats complies with findings from a recent study by Njuki et al. (2011) in Kenya and Tanzania showing that compared with other livestock species, including poultry, goats were the least likely livestock species to be owned by women in some traditional setups. Results from the study sites showed that not only is women's ownership of goats limited, so is their control over goat products. Women from the study sites were more likely to decide on how to use the milk allocated for home consumption but less likely to control the proceeds from sale. As the demand for milk and milk products increases in cities and milk points, men's role in milk marketing has taken centre stage with women's participation limited due to their commitment to domestic productive activities at the homestead. Based on a review by Sinn et al. (1999) on role of women in the sheep and goat sector, various factors increase women's likelihood to own goats and sheep. Reasons identified include the ease with which goats can be tethered near the home or roadside and the fact that goats can successfully utilize a variety of feeds such as crop residues and food wastes. These

benefits translate into low investment costs and reduced livestock husbandry restrictions which often result from women’s ‘limited access to and ownership of land’.

Combined, these results highlight the importance to the CGP study of conducting primary research on context and area specific information on goat ownership in the study communities with the aim of encouraging/ ensuring joint ownership of dairy goats and equitable benefits of project interventions by men and women in the households. Suggestions like one made by the Masinyeti women group on use of group dynamism, that:

‘Women need to be elected in senior positions in groups to ensure their interests are represented’ might be one of the first steps required to ensure women benefit equally from project interventions.

All goats in the two districts were of local breeds and were hardly used for milk. Women and men kept goats mainly for income, food (meat) and manure, but women also kept them more as assets than men. Only men used goats for ceremonies and sold their skins and hides. Other benefits associated with goats, by women and men, included the ease with which goats can be tethered near the home or at the roadside and the fact that goats can successfully utilize a variety of feeds such as crop residues and household food wastes (Figure 9). These benefits translate into low investment costs and reduced livestock husbandry restrictions.

Figure 12. Objectives and advantages of keeping goats

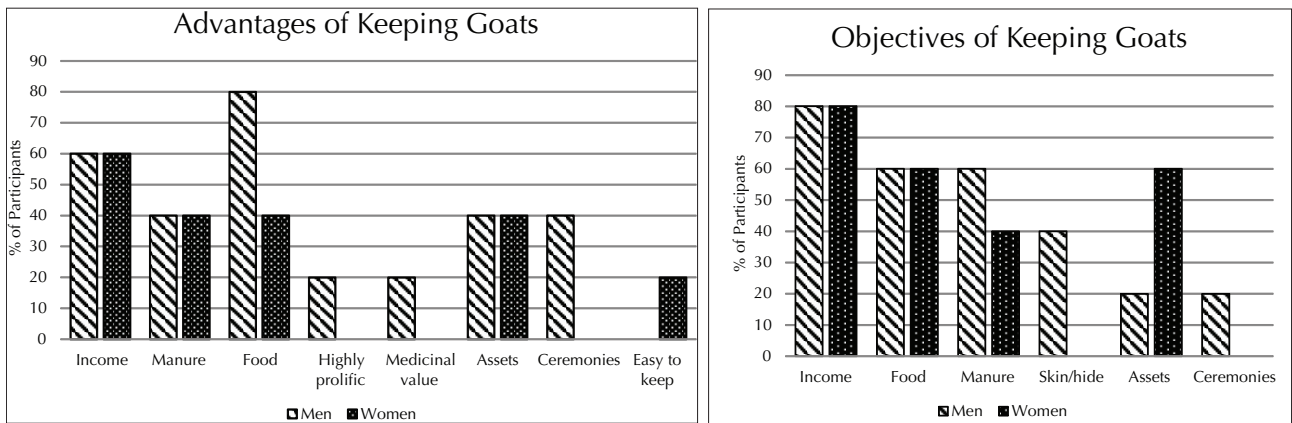
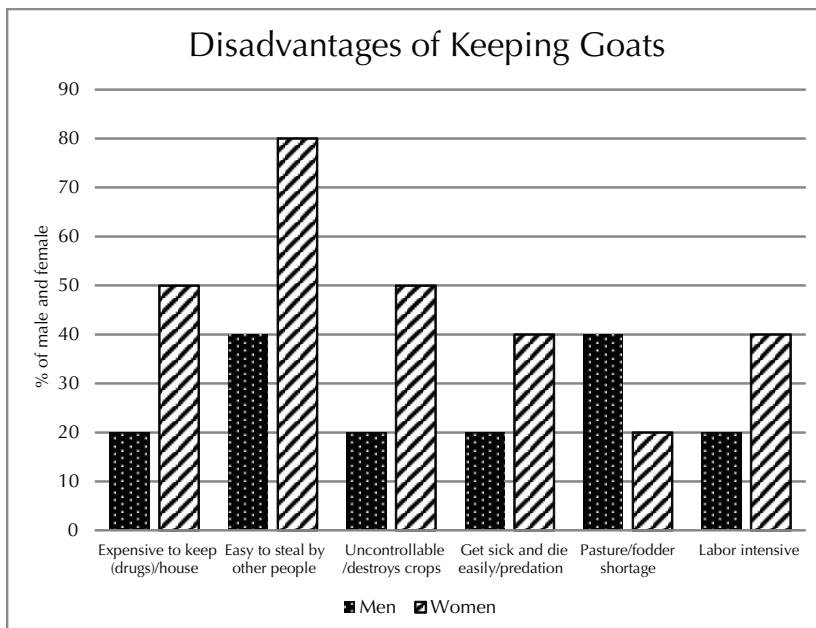


Figure 13. Disadvantages of keeping goats



The biggest challenge to keeping goats is that they get sick easily and die, which is a big loss to the owner. Shortage and the high cost of medicines exacerbate this challenge. The fact that goats are small and easy to carry also makes them easy to steal. Their agility enables them to wiggle through small spaces into people's crops and this causes conflict with the owners of damaged crops and costs the goat owners much money to compensate the crop owners for damaged crops.

Women appeared to give more responses than men on the disadvantages of keeping goat (figure 10). Women might be more aware of these challenges because they interact more closely with goats than men e.g. when cleaning the goat house and when they supervise children herding the goats.

Gender roles in goats management

The gendered divisions of goat management activities are dictated by circumstances that are not static and that are liable to change over time. Typically, women from the study sites are responsible for caring for animals kept at the homestead. Labour patterns, however, vary for both men and women in the two districts. The results showed that an important set of differences in activities is associated with gender as well as with age. Herding and cleaning the goat house, the two primary goat-related activities were gendered. Men herded and women cleaned the goat house. During the day, men and children herded goats in communal or other pastures. Cleaning the goat house lasted between 10 and 30 minutes depending on the size of the goat pen, the number of goats and how frequently the pen was cleaned.

Herding lasted between 2–10 hours depending on the availability of pasture and how available the herder was to watch over them. Where goats were herded longer than four hours, they were herded in shifts of two or more hours in the morning and late afternoon.

In addition to managing and supervising herding, men were responsible for a variety of activities including gathering and assimilating information on water availability, range conditions and market situation in order to make informed herding decisions. Women on the other hand fetched water for the animals and took care of the sick kids, in addition to cleaning. Sometimes in the dry season, women stall-fed goats with purchased grain by-products they bought from the market. Children helped both men and women in these chores, but only when they were not in school.

For many goat keepers, feed scarcity was identified as major constraint to successful goat management. Participants complained about poor access to good quality feed, which resulted in high goat mortality rates, especially during droughts. Consequently, demands of women's and children's labour increased during the dry season as they collected dried leaves and fodder for goats from nearby forests. Only the rich could hire casual labourers to herd their goats and pay them between TZS 500 and TZS 1000 per day depending on the number of goats and the age of the herder.

Changing livelihood opportunities were identified as a factor that influenced gender and goat management. According to participants, women's contribution to livestock-related activities has increased over the recent years because various economic and social factors have led to changes in traditional division of labour in livestock management. For example, many young men and women have migrated to neighbouring towns and cities in search of more financially rewarding and less physically demanding unskilled employment. As a result, women's livestock-related workload has dramatically increased, possibly competing with time demands for other domestic responsibilities.

The results support findings from several studies demonstrating that livestock activities for women in African increased with intensification of production (Curry 1996; Mullins et al. 1996 and Wangui 2008) such as in integrated mixed crop livestock systems (IFAD 2000). For successful implementation of the CGP, its effect on the seasonal gender differences in livestock activities such as feeding, watering and milking must be well understood so that overworking women, while denying them control over the products of the integrated and intensification production system, can be avoided.

Gender decision-making on goat husbandry

The types of rights men and women have on goats, and other livestock differ in the two selected districts. Differences in decision-making rights and the role this plays in livestock management were of particular importance to this study. It is evident from the results that decision-making over goats is gendered (Table 7). Women may have access to goats in the form of management responsibilities, but have limited control over decisions on sale and use of incomes generated. In the few cases where joint ownership was reported, incomes generated from goat sales were controlled solely by the man. In some situations, women keep money from goat sales but only men made the key sale and expenditure decisions.

Table 7. Goat ownership and decision-making

Issues surrounding goats ownership and decision-making	Who decides
Who mainly owns?	Men
Who decides number of goats to keep?	Men
Types of goats to keep?	Men
To sell or not?	Men
How much milk to sell	Men
How to use the proceeds from goats' sales?	Men
How to use money from milk sales?	Men
Profit sharing?	Men

There is also a distinct relationship between women's limited decision-making ability and their observed disempowerment. Asked how goat ownership could be made more equitable, there was resistance from men, and scepticism among women in the community. As a woman from Ihanda women group explained:

'Is it possible, will men allow us to own goats? Some women may not want to partake in the project because they assume that women want to change tradition. It has never happened that women decide on goat ownership and sale of goats even if it is owned jointly in this community; all decisions over goats are made by men.'

At Wamiluhindo, the mixed group showed resigned attitude towards goat ownership by women and women's fear of (possible backlash stemming from) such idea:

'If the project insists, then 'they' can go ahead (men).

This sounded like (and was) a threat.

'If the project insists, we can own them, but we'll have no control (women).'

These findings underscore the dominant economic position of men and the traditions/discourses that maintain it by denying women ownership and the ability to make decisions over goats.

Similar findings, whereby women livestock keepers from male headed households were less likely than men to engage in livestock marketing and, control incomes from sales were reported in a livestock value chain study in Tanzania (Njuki et al. 2011). Although women can acquire and own livestock through traditional ceremonies, inheritance and bride wealth, they have little control and ability to make decision (Talle 1988; Joeke and Pointing 1991).

Another possible factor influencing men's high level of decision making over goats in Tanzania could be related to the financial value attached to goat production in the communities and distance to markets. It is argued that the economic function of specific animals determines the degree to which men and women exert control over livestock and livestock products (IFAD 2000). Markets for goats are farther from villages, this limit women's ability to travel long distances to transact due to other domestic roles they assume.

Based on these findings, for CGP to benefit communities in the study sites, there is need to create awareness between men and women in gender equitable market driven solutions and competitiveness which can be a catalyst in promoting gender equality goals when they understand the business potential that could accrue for both men and women which can alleviate household poverty. Project implementers should facilitate understanding of how addressing gender issues is 'good economics' and support the development of solutions that create equal opportunities for men and women in commercial benefits.

In addition, to increase potential benefits across gender, the project must partner with men, women and the youth in the community and provide updated periodic information as demanded by participants on project interventions and activities.

4.3 Gender and root crop production

Women's ability to produce crops depends upon availability of land. In Tanzania, both cassava and sweetpotatoes are important subsistence food crops and are sometimes considered as food reserve during droughts (Kapinga et al. 1995).

Gendered ownership of and preference for crops

Land access is determined by patrilineal inheritance, whereby after the initial issuance to the family head by the local chiefs/leaders, it is passed on to the male offspring. Women's access to land was dependent on their husband's or their father's will. Men identified inheritance whereas women identified renting as the main modes of acquisition of land. On average, households cultivated between 1–5 acres of land owned by the husband and dedicated 5–50% of this land to cassava and sweetpotatoes. Cassava was intercropped with maize in most areas. Sweetpotatoes were less widely distributed than cassava and with legumes. Women's control over the crops they grew varied between partial and total control, but they had no control over land. They had only usufruct rights to land.

A woman in a mixed group in Kunke summed it up this way:

'My husband owns the farm. He gave me some portion to plant food, but I only own what is planted in it'.

As explained by participants, cassava and sweetpotatoes are predominantly produced by women for household subsistence and sale of surplus to local markets. Some reasons for low cassava productivity cited by both men and women included the prevalent cassava mosaic diseases, low soil fertility, high prevalence low yielding local varieties and lack of markets.

Ownership of crops between men and women is quite distinct, depends on the market prices of crops and on the success of the crop they grow for cash. Men own cash crops or crops for cash whereas women own subsistence or food crops for home consumption. Even crops traditionally owned by women become men's once they become commercialized. Similar findings were reported by Njuki et al. (2011) in Uganda and Malawi. Women were not involved in production of cash crops such as sugarcane and sunflower, but grew lower-value subsistence crops such as cowpeas and vegetables instead. This is most likely because they have limited access to land, inputs, credit, information, and markets for these crops.

Gender role in management of crops

The main crop management activities involved clearing, ploughing, planting, harvesting and post-harvest handling. The allocation of agricultural tasks tends to be gendered, and are influenced by the scale and purpose of production—subsistence or cash. Cassava and sweetpotatoes were tagged as 'women' crops even though few women cultivated these crops; maize and paddy were cultivated by men. Women prepared land, harvested and participated in post-harvest activities. They also assist in their husband's crop farms, but the husbands never assisted the women with their crops. A woman in Kunke explained disequilibrium intrinsic in men and women daily farm management activities as:

'When the husband is hungry, he eats with you but when you are going to the farm, he walks away and goes to another woman's house. If he does follow, he leaves you behind in the farm to carry on with farm activities while he goes visiting his friends in neighbouring village'-(Kunke women GD)

Similar research in southwestern Nigeria found that women produce and process between 30–80% of food (Abdulsalam-Saghir 2011) with little or no help from spouse. Men were more involved in land preparation and often engaged in land clearing. Children worked with both parents, but more with the father, during school holidays. Men, therefore, benefit from free labour from their wives and children.

Owing to migration to other areas, the line between what women do compared to what men do in terms of crop production and management is blurred. Men mainly migrate to the cities and neighbouring villages in search of casual employment. Casual jobs include, working on sugarcane plantations, building barns or partaking in other labour-intensive harvest areas. Women too migrate to other farms in search of casual labour during food scarcity to help meet household needs. Migration, therefore, has significant consequences for crop production such that young people who are not interested in the drudgery that farming brings, are left to handle crop production. Alternatively, farms are neglected and less food is produced by affected households and communities.

In spite of their agricultural responsibilities, women—except the rich ones—explained that they could not hire additional labour. Motorized farming is inaccessible to most men and women, with men using draft animals to plough and transport produce to markets. Women, on the other hand weed animal ploughed fields by hand increasing the work load of women further. Poor rural farmers have limited access to agricultural inputs with women facing steeper constraints to access than men (World Bank 2009).

Gendered decision-making over crops

While women contribute significant labour to crop production, the degree to which they benefit from their labour depends on their ability to make crop-related decisions. Several women from this study commented that the *'husband was the head of the household and had the final say in everything'*. Majority of participants indicated that men were mainly in charge of crop and investment related decision-making, but they discussed with their spouses. Wealth status had a direct relation with individual decision-making on crops. For example, rich men and women decided on what crops to cultivate, whereas average wealth and poor farmers worked on wealthy farmers' farms as casual labour. On their own farms, women were allowed to sell products but, with the exception of emergencies, decisions on how proceeds were to be spent were made by men. For crops produced by women, decisions over their sales were made jointly; but if produced by men, decisions were made unilaterally. A woman in Masinyeti explained the socially expected attitude of women in their community:

'I must tell my husband when I want to sell so that he helps me negotiate with the buyer. Then we share the proceeds from the sale. If I have to sell by myself, I must sell secretly and in small bits. He also borrows money from sales from me and does not pay me back'

Women also decided on food crop allocation such as the amount to produce. Some women indicated that their husbands contributed to household upkeep with the money from crop sales. Not all men, according to women, supported their families sufficiently. In response to a question on what men do with their money from crop sale, a woman in Ihanda said:

'We are in Africa; you do not query your husband's finances, besides men have two pockets, a front one and a back one. The front one is the only one visible to his wife, the back one, he keeps to himself to cater for his own needs and no one else'

The fact that agricultural productivity could increase by 20–30% if women's access to resources were equal to men's and raise agricultural output by 2.5–4% and reduce hungry people by 100–150 million (FAO 2011) is reason enough to promote projects that will enhance women's control over crops and income from sale of crops.

4.4 Perceptions towards introduction of dairy goats integration with root crops

According to Ekong (2003), adoption or rejection of innovation has always been influenced, in varying degrees, by complementarities of males and females perceptions and roles within farm families. For instance, Campbell and Baker (1997) reported that an innovation that increased yield in cassava and subsequently improved men's income was abandoned in Zaire because women perceived it has increased their work loads. In a Latin American community, a piped water project to help eradicate guinea worm infestation failed because its utilization was perceived as disrupting social interaction among women (Rogers 1995). These examples indicate that men and women's perceptions matter because they can influence intended interventions positively or negatively. In this section, therefore, we attempt to determine how males on one hand and females on the other perceive introduction of dairy goats with cassava and sweetpotatoes as an integrated farming system.

Participants explained how integrated dairy goat and crop production complemented each other and provided many advantages over crops or livestock production in isolation. Integrated crop–livestock production reduced risk of food insecurity due to the diversification of production. Cassava and sweetpotatoes produced high-

quality leaves, peels and tubers that could be fed to goats. Goats fed on these crop residues could provide manure to fertilize the soil and improve future harvests. Perceptions of women and men on the potential benefits of integrating root crops and goat varied. Men perceived value addition resulting from owning dairy goats and the attendant increase in income for them and women perceived change in status quo and increase workload resulting from stall goat management activities which may not lead to increase in income for them.

At the time of the study, few people in the study sites owned dairy goats. Participants could not, therefore, speculate on potential benefits of owning goat milk. One recognized benefit of dairy goat milk was its superior nutritive value especially in relation to HIV/AIDS patients' support.

Participants explained that, farmers do not feed sweetpotatoes or cassava roots to goats because the roots are used up by the household. Sweetpotatoes vines are more easily fed to livestock than cassava leaves because different cassava varieties contain different concentrations of cyanide, which is a poisonous compound consisting of carbon and nitrogen. Due to the cyanide, farmers are wary of feeding their goats with cassava root, peel or leave because the unknown cyanide content might poison and kill the goats. Circumstances under which cattle and goats are can be fed sweetpotatoes and cassava roots include when there is scarcity of fodder resulting from drought.

Another concern voiced by women was that any foreseeable increase in income from integrated farming for women might result in the withdrawal of men from household responsibilities. They perceived that men are more likely to spend the money outside the household. This belief that men may marry additional wives and withdraw financial support to the established unit was shared by both women and men in the group discussions.

'If women get more empowered and have more income, the men will abandon their duties to their families, e.g. get another wife or use the money to service other relationship than his immediate family'- (Mixed GD, Wamiluhindo)

In spite of the expressed fears, there was great anticipation for total participation in project activities in the communities studied. Men envisaged increase in their income due to the project and awaited the arrival of improved goats and crops. Some participants explained that the anticipated increase in men's real income could come about either through men accessing women's income, or more commonly, the substitution of women's earnings from project benefits for men's expenditure on household needs and children's education.

To avert the looming possibility of excluding all women, beneficiary training on gender and the importance of gender equity and equality for sustainable development was considered by participants a necessary pre-requisite to project success. As expressed by both men and women participants:

'Please, help us to make both women and men understand equitable ownership of dairy goats, we (women) do not see the possibility' 'If the project can show that distribution of goats—including ownership and control over the goats, milk and income accrued from them—can be gender balanced, then people will see that the intervention is possible'.

Some community members seem to understand the concept of cost sharing and are willing to share some of the costs. Others seem to want to be supported with goats as well as housing materials. Training on sustainable development and the need to actively participate, including financial contribution, could enable all beneficiaries to have a common understanding of the projects goal.

There were differences in the solutions offered by men and women groups. Men's suggestions were more pragmatic, and women suggestions were more flexible. As part of solution for women to be able to participate and fully benefit from project intervention, some women suggested that if project implementers are considering criteria for ensuring equitable benefits, women group should be considered and local council should be consulted:

'The first beneficiaries should be from groups of 10 people, those of average wealth and poor households that are capable of caring for goats and providing medicine (Women group, Kunke).

'The village council/governments should decide'. (Mixed group, Kunke and Masinyeti)

Whereas men in Wamiluhindo and Kunke insisted that:

'The beneficiary should be selected by the officials based on their undisclosed criteria, should have pre-existing knowledge of how to keep goats and possess the capacity to raise goats especially the ability to get fodder and good house. But most importantly, village council should be consulted'

4.5 Perceptions to introduction of dairy goats

Both men and women expressed different reservations about the potential benefits of introduction of dairy goats. Since women do not own goats traditionally, it was difficult for them to foresee benefits from the interventions, especially with regard to the equitable ownership and distribution of dairy goats. The main threat to the success of project was described by participants as the likelihood that dairy goats given to women might be possessed by husbands forcefully. As a woman participant in Masinyeti proclaimed:

'Selfish men may use violence to retain total control over the goats'.

Whereas men in mixed group (Kunke) protested that:

'If women own goats, they will start disrespecting their husbands and think that they can be independent and do as they wish.'

After being asked how best to increase women's ownership of dairy goats as part of the project intervention, one man (mixed group) in Kunke explained that:

'It is not possible to give goats to my wife without my consent, I must be informed and involved from the onset' summed the need to ensure joint ownership, involvement and participation of both men, women and youth in project benefits and activities.

Women anticipated benefits such as more milk for household consumption and sale as surplus, but also anticipated expenses on health and husbandry of the goats. In addition, women considered an increase in their workload because dairy goats are stall fed and would therefore fall under their responsibility. Women also explained that they expected trade-offs between the inability to herd and stall feeding which is very advantageous to them and remove the barrier they face in herding.

Men, on the other hand, anticipated extra costs of building goat houses and paying for para-vet services. However, dairy goats are bigger and produce more milk than local goats and are expected to earn income from

sale of milk and offspring, compensating for increased costs incurred. Men anticipated freedom from endless hours of herding goats, enabling them to invest this free time in other more profitable activities. Socio-culturally, men anticipated that dairy goat ownership would elevate the owners' status in society as the goats are very valuable.

In terms of what they can contribute as cost sharing towards the project, men and women reported three main constraints: the inability, especially of women, to access capital and credit facilities to purchase dairy goats and build a goat house; inability to obtain animal health and production services because dairy goats 'get sick easily' and inability to access reliable markets for products since the formal markets were still inaccessible owing to poor road and transport infrastructure.

5 Conclusions and recommendations

The gender analysis on perceived potential on introduction of dairy goat with improved cassava and sweet potatoes varieties reported here found that both men and women were involved in livestock and crop production, but the roles, ownership, decision-making and management varied between women and men. Often, men and women shared work but men controlled the goats and any income accrued from their sale or sale of any of their products. There were willingness by both men and women to partner on equitable benefits of project interventions but called for more gender awareness and training at the household and community levels.

There are gender differences on perceived potential on integrating root crops and dairy goat production, as prevailing tradition may limit women's participation. CGP project is viewed as timely and will be more beneficial to men, women and youths if joint and equitable benefits of project interventions are ensured.

Projects and programs, when designed with gender equitable principles, can encompass both competitiveness and gender equity to enhance poverty reduction impacts. Women may benefit more from the project because of the attendant trade-off between stall feeding and herding. Again, the benefits that could accrue from their equitable involvement will guarantee sustainable livelihoods for them and their family.

There are economic, cultural and social barriers to participation and equitable benefits of the disadvantaged in projects. The main constraints are rigid tradition and culture against women ownership and decision making over goats. Also, innovations with potential to generate a significant cash flow attract local elites and often become dominated by men. The strength of the project communities is that there are women groups that are relatively autonomous, can integrate production and benefits, can work at their own pace and retain the income from the sale of their products for the households and community use.

There are some recommendations arising from this study; one, Gender equitable participation in project activities must be fostered to create the conditions for both men and women to participate in project intervention and activities, from participation in training and public-private dialogues. Project-sponsored activities should insist that men, women, and youth are invited to participate.

Men should be involved in identifying, defining gender based constraints and opportunities for equitable project benefits in the communities. Programs can bring men, women and youths to the table to clarify their roles in, for example, to define equitable criteria for ownership, management, and decision making over project benefits.

Project implementers should understand men's, women's and youths roles and relations and use this information in the design and implementation of their activities. Well-informed implementers are better able to anticipate and address gender-based constraints and seize opportunities to support gender equality.

The very poor households may be limited in their participation, especially those that require ownership or access to land and resources or cost sharing between projects and communities. A strategy to enable them to participate would be to organize into groups and get communal land where they can get individual plots or work communally to propagate both sweet potato and cassava root crops for sale as seedlings and food and fodder to other community members. Through collective action, household may also organize co-contributors from members in revolving loans schemes.

Investing in rigorous gender trainings for both women and men, to initially sensitize them on the importance of including both women and men in development projects and sustain their continued understanding of the importance of gender inclusive activities is required before initiating development interventions. This should then be accompanied by the development of indicators to track involvement of women project activities and benefits accruing to them. This should be a participatory process involving both men and women.

In addition, direct targeting of the disadvantaged should be a key strategy. Provision of assets to women by projects can be a good starting point to establish women's ownership of assets such as goats. This could start with joint men and women ownership within households for any project assets provided to households. This ensures joint responsibilities and commitment towards such assets and gradual closure of assets ownership gap.

Coupled with training, this could change the rigid gender perceptions on property ownership.

Existing women and special interest groups should be considered as a potential entry points for interventions. Interventions will benefit from the familiarity of the group with the community rules as well as the power of collective action inherent in groups. Working with groups will also facilitate more efficient resource management since the community resource management techniques that have worked before will be adopted.

Using existing community resource management techniques that have worked before strengthens community institutions and relationships between these institutions. Local institutions are key actors in promoting change and recognition of good practice by these institutions, e.g. through a 'best gender practice award' can increase motivation to address gender disparity.

There is a need to recognize multiple demands on women's income and develop affordable rather than capital intensive approaches to participating in projects. Project interventions needs to invest resources (money and time) in gender training, in all research sites, for both men and women. Activities to strengthen women's role in decision-making in the household, farmer groups, and local associations include training women in group formation, leadership skills, confidence building and negotiating skills should be part of intervention activities.

REFERENCES

- Abdulsalam-Saghir, P.B. 2011. Cassava: Adding value for Africa: Gender as a driving force. Agricultural innovations for sustainable development: Contributions from the finalists of the 2009/2010 African-wide Women and Young Professionals in Science Competition. CTA 3(2)
- Adams, A., Evans, T.G., Mhammed, R. and Farnsworth, J. 1997. Socio-economic stratification by wealth ranking: Is it valid? *World Development* 25(7):1165–1172.
- Adger, W.N. and Vincent, K. 2005. Uncertainty in adaptive capacity. *C. R. Geoscience* 337(4):399–410.
- Agarwal, B. 1997. 'Bargaining' and gender relations: Within and beyond the household. *Feminist Economics* 3(1):1–51.
- Amati, C. and Parkins, J.R. 2011. Improved goat breeding and mixed crop farming in East Africa: A literature review. Department of Resources Economics and Environmental Sociology, University of Alberta.
- Aregheore, E. 2004. Nutritive value of sweetpotato (*Ipomea batatas* (L) Lam) forage as goat feed: Voluntary intake, growth and digestibility of mixed rations of sweetpotato and batiki grass (*Ischaemum aristatum* var. indicum). *Small Ruminant Research* 51(3):235–241.
- Blaikie, P., Cannon, T., Davis, I. and Wisner, B. 1994. *At risk: Natural hazards, people's vulnerability and disasters*. London, Routledge.
- Bravo-Baumann, H. 2000. Capitalisation of experiences on the contribution of livestock projects to gender issues. Working Document. Bern, Swiss Agency for Development and Cooperation.
- Bray, R., Vakil, C. and Elliott, D. 2005. Report on public health and urban sprawl in Ontario. Environmental Health Committee, Ontario College of Family Physicians. (www.ocfp.on.ca/local/files/Communications/Current%20Issues/Urban%20Sprawl-Jan-05.pdf).
- Campbell, D.A. and Baker, C. 1997. Selecting appropriate content and methods in program delivery. In: Swanson, E.B., Bentz, R.P. and Sofronko, A.J. (eds), *Improving agricultural extension: A reference manual*. Rome: FAO. 68–75
- Catholic Education Service of England and Wales. 2008. (Available from <http://www.cesew.org.uk/uploads/documents/cherishing>) (Accessed on 16th January 2012).
- Chambers, R. 1994. Participatory rural appraisal: Challenges, potentials and paradigm. *World Development* 22(10):1437–1451.
- Chambers, R. 1998. Sustainable rural livelihoods: A key for people, environment and development. In: Conroy, C. and Litvinoff, M. (eds), *The greening of aid*. Earthscan, London, UK.
- Chambers, R. and Coney, G. 1992. Sustainable rural livelihoods: Practical concept for the 21st century. IDS Discussion Paper NO. 296. Institute of Development Studies, Brighton, UK.

- Chenyambuga, S.W., Hanotte, O., Horbo, J., Watts, P.C., Kemp, S.J., Kifaro, G.C., Gwakisa, P.S., Petersen, P.H. and Rege, J.E.O. 2004. Genetic characterization of indigenous goats of sub-Saharan Africa using microsatellite DNA markers. *Asian-Aust. J. Anim. Sci.* 17:445–452.
- Curry, J. 1996. Gender and livestock in African production systems: An introduction. *Human Ecology* 24(2):149–160.
- Curran, S. and Cook, J. 2009. Gender and cropping: Cassava in sub-Saharan Africa.
- Dahinya, M. 1994. An overview of cassava in Africa. *African Crop Science Journal* 2(4):337–343.
- Deere, C.D. and Doss, C. 2006. Gender and the distribution of wealth in developing countries. United Nations University—World Institute for Development Research (UNU-WIDER). Research Paper No. 2006/115.
- Dillion, A. and Quinones, E.J. 2011. Gender differentiated asset dynamics in Northern Nigeria. ESA working paper No. 11–106. Agriculture Development Economics Division, FAO-UN, 30 pp.
- Dung, N.T., van Binh, D., Mui, N.T. and Preston, T. 2010. Effect of cassava hay supplementation on milk production in lactating goats. *Livestock Research for Rural Development* 22(3).
- Ekong, E.E. 2003. An introduction to rural sociology. 2nd Ed. Uyo. Dove Education Publishers.
- FAO (Food and Agriculture Organization of the United Nations). 1997. FAO production yearbook 1996 Vol. 50, FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations). 2006. Livestock report 2006. FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations). 2007. Women and food security. FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations). 2011. State of food and agriculture on women and agriculture. FAO, Rome.
- Fernandez-Rivera, S., Okike, I. and Manyong, V. 2004. Classification and description of the major farming systems incorporating ruminant livestock in West Africa. In: Sustainable crop–livestock production for improved livelihoods and natural resources management in West Africa. Proceedings of an international conference held at IITA, Ibadan, Nigeria.
- Galab, S. and Rao, C. 2003. Women self-help groups: Poverty alleviation and empowerment. *Economic and Poverty Weekly* 38(12/13):1274–1283.
- von Grebmer, K., Nestorova, B., Quisumbing, A.R., Fertziger, R., Fritschel, H., Pandya-Lorch, R. and Yohannes, Y. 2009. 2009 Global Hunger Index: The challenge of hunger: Focus on financial crisis and gender inequality. Bonn/Washington, D.C./Republic of Ireland: Deutsche Welthungerhilfe (German AgroAction) International Food Policy Research Institute (IFPRI) Concern Worldwide.
- IFAD (International Fund for Agricultural Development). 2000. An IFAD approach to gender mainstreaming: Experience of the Latin America and the Caribbean Division. IFAD, Rome.
- IFAD (International Fund for Agricultural Development). 2002. The rural poor: Survival or a better life? The choice between destruction of resources and sustainable development. Paper submitted to the World Summit on Sustainable Development, Johannesburg.
- IFAD (International Fund for Agricultural Development) and FAO (Food and Agriculture Organization of the United Nations). 2005. A review of cassava in Africa with country case studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin. IFAD, Rome, Italy.
- IIED RRA Notes 1988. Issue 2, pp. 12–17, IIED London.
- Iyayi, E.A and Tewe, O.O. 1994. Cassava feeding in small holder livestock units. *Acta Horticulturae* 375:261–269.

- Ingratubun, G.F., Owen, E., Massawe, N. F., Mtenga, L.A. and Mtengeti, E.G. 2000. Effects of upgrading small East African goats on feed resource utilisation in the Uluguru Mountains in Tanzania: A farmers perspective. *Livestock Research for Rural Development* 12(3).
- Joekes, S. and Pointing, J. 1991. Women in pastoral societies in East and West Africa. Issue Paper No. 28. IIED (International Institute for Environment and Development), London, UK.
- Kapinga, R., Ewell, P. and Jeremiah, S. 1995. Sweetpotato in Tanzanian farming and food systems: Implications for research. Development, Tanzania.
- Kelkar, G. 2009. Gender and productive assets: Implications for national rural employment guarantee for women's agency and productivity. FAO-IFAD-ILO workshop on gaps, trends and current research in gender dimensions of agriculture and rural employment: Differentiated pathways out of poverty, held 31 March–2 April 2009 Rome, Italy.
- Kristjanson, P., Waters-Bayer, A., Johnson, N., Tipilda, A., Njuki, J., Baltenweck, I., Grace D. and MacMillan, S. 2010. Livestock and women's livelihoods: A review of the recent evidence. International Livestock Research Institute Discussion Paper No. 20. ILRI, Nairobi, Kenya.
- Kryger, K.N., Thomasen, K.A., Whyte, M.A. and Dissing, M. 2008. Smallholder poultry production—Livelihoods, food security and sociocultural significance. Network for Smallholder Poultry Development, Rome, FAO.
- Kuoko, S.S., Mbwambo, J.S. and Meghji, N.M. 1993. Survey of sweetpotato in the food systems of Tanzania—Case study (Northern zone). Kilimanjaro, Arusha and Tanga regions. Horti-Tengeru, Arusha. 20 pp.
- Lenné, J. and Thomas, D. 2006. Integrating crop–livestock research and development in sub-Saharan Africa: Option, imperative or impossible? *Outlook on Agriculture* 35(3):167–175.
- León-Velarde, C. 2000. Using competing traits to select dual-purpose sweetpotato in native germplasm. International Potato Center (CIP), Lima, Peru. pp. 289–294.
- Lesorogol, C., Chowa, G. and Ansong, D. 2011. Livestock or the pen: The effects of inheritance and education on poverty among pastoralists. Chronic poverty research centre (CPRC) Working Paper No. 188.
- Maro, P.S. and Majule, A.E. (eds). 1999. Strengthening local agricultural innovations to adapt to climate change in Botswana, Malawi, South Africa and Tanzania.
- McCorkler, C. (ed). 1992. Improving sheep and alpaca production: Recommendations from a decade of research in Peru. Small Ruminant Collaborative Research and Support Program, University of Missouri, Columbia.
- MFEA (Ministry of Finance and Economic Affairs). 2010. The United Republic of Tanzania National Strategy for Growth and Reduction of Poverty 2. (Available from http://www.tzdp.gov.tz/uploads/media/MKUKUTA_II_03.pdf) (Accessed on 11th September 2011).
- Mkenda-Mugittu, V.F. 2003. Measuring the invisibles: Gender mainstreaming and monitoring experience from a dairy development project in Tanzania. *Development in Practice* 13(5).
- Mtenga, L.A. and Kifaro, G.C. 1992. Dairy goat research and extension at Sokoine University of Agriculture (Lowlands) and Mgeta (highlands) areas of Tanzania. In: Kategile, J.A. and Mubis, S. (eds), Future of livestock industries in East and Southern Africa. Proceedings of a workshop held at Kadoma Ranch Hotel, Zimbabwe, 20–23 July 1992. ILCA (International Livestock Centre for Africa), Addis Ababa, Ethiopia.
- Mullins, G.L., Wahome, P.T. Sangar, A. and Maarse, L. 1996. Impact of intensive dairy production in smallholder farm women in Coastal Kenya. *Human Ecology* 24(2):231–253.
- Narayan, D., Patel, R., Schafft, K., Rademacher, A. and Schulle, K.S. 2000. Changing gender relations in the household. In: *Voices of the poor: Can anyone hear us?* The International Bank of Reconstruction and Development/The World Bank, Oxford University Press. 343 pp.

- National Bureau of Statistics. 2003. Tanzania agricultural census 2002–2003—Main results Small Holdings Sector.
- Ngi, J., Ayoade, J.A. and Oluremi, O.I.A. 2006. Evaluation of dried cassava leaf meal and maize offal as supplement for goat fed rice straw in dry season. *Livestock Research Development* 18(9).
- Njuki, J, Kaaria, S. Chamunorwa, A. and Chiuri, W. 2011. Linking smallholder farmers to markets, gender and intra-household dynamics: Does the choice of commodity matter? *European Journal of Development Research*.
- Nweke, F.I. and Enete, A.A. 1999. Gender surprises in food production, processing, and marketing with emphasis on cassava in Africa. IITA.
- Nyaata, O., Dorward, P., Keatinge, J.D.H. and O'Neill, M. 2000. Availability and use of dry season feed resources on smallholder dairy farms in Central Kenya. *Agroforestry Systems* 50(3):315–331.
- Oluka, J., Owoyesigire, B., Esendu, B. and Ssswannyana, E. 2004. Small stock and women in livestock production in the Teso framing system region of Uganda. In: *Small stock in development: Proceedings of a workshop on enhancing the contribution of small livestock to the livelihoods of resource poor communities*. Hotel Brovad, Masaka, Uganda. *Development Economics* 66(1):225–269.
- Pauw, K. and Thurlow, J. 2010. Agricultural growth, poverty, and nutrition in Tanzania. *Food Policy* 36(6):795–804.
- Quisumbing, A.R., Haddad, L. and Peña, C. 2001. Are women over-represented among the poor? An analysis of poverty in ten developing countries. *Journal of Development Economics* 66(1):225–269.
- Rao, N. 2005. Women's rights to land assets: Experience of mainstreaming gender in development projects. *Economic Political Weekly* 40(44/45):4701–4708.
- Rogers, M.O. 1995. *Diffusion of innovation*. (4th ed.) New York, USA.
- Sabates-Wheeler, R. 2006. *Asset inequality and agricultural growth: How are patterns of asset inequality established and reproduced? WDR background paper on asset inequality and agricultural productivity*. Washington, DC: The World Bank.
- Sanni, L.O., Maziya-Dixon, B., Okoruwa, A.E., Arowosafe, B., Lemchi, J., Ogbe, F., Ezedinma, C., Okechukwu, R.U., Akoroda, M., Okoro, E., Ilona, P., Babaleye, T. and Dixon, A. 2007. *Cassava utilization training for bakers, caterers, and processors in the South–South and Southeast of Nigeria*, IITA, Ibadan.
- Sass, J. 2001. *Women, men and environmental changes: The gender dimensions of environmental policies and programs*. Policy brief prepared for the Population Reference Bureau. Washington, DC, USA.
- Semenye, P., Onim, J., Conelly, W. and Fitzhugh, H. 1989. On-farm evaluation of dual-purpose goat production systems in Kenya. *Journal of animal science* 67(11):3096.
- Smith, O.B. 1992. A review of ruminant responses to cassava based diets. In: Hahn, S.K., Reynold, L. and Egbunike, G.N. (eds), *Utilization of cassava as livestock feed in Africa*. Ibadan, Nigeria. pp. 135–142.
- Staal, S.J., Pratt, A.N. and Jabbar, M. 2008. *Dairy development for the resource poor. Part 2: Kenya and Ethiopia case studies*. Pro poor Livestock Initiative Working Paper No. 44-2. ILRI, Nairobi, Kenya.
- Talle, A. 1988. *Women at loss: Changes in Maasai pastoralism and their effects on gender relations*. Stockholm Studies in Social Anthropology, Stockholm.
- Tolera, A., Merkel, R.C., Goetsch, A.L., Tilahun, S. and Negesse, T. 2000. *Nutritional constraints and future prospects for goat production in East Africa*. In: *The opportunities and challenges of enhancing goat production in East Africa*. A conference held at Awassa College of Agriculture, Debub University. Langston University, Langston, Oklahoma, USA.

- The United Republic of Tanzania, National website. The Economic Survey 2005. (Available from <http://www.tanzania.go.tz/economicsurveyf.html>) (Accessed on 5/02/11).
- USAID. 2009. Women's milk and small ruminant marketing in Mandera Triangle.
- Valdivia, C. 2001. Gender livestock assets, resource management and food security: Lessons from the SR-CRSP. *Agriculture and Human Values* 18:27–29.
- Waithanji, E., Njuki, J., Mburu, S., Kariuki, J. and Sanginga, N. 2012. Walking to the market: Women's participation in livestock markets in Kenya and Mozambique. Forthcoming.
- Wangui, E.E. 2008. Development interventions, changing livelihoods and the making of Female Masaai pastoralists. *Agriculture and Human Values* 25:365–378.
- World Bank. 2009. Gender and agriculture: Sourcebook. The World Bank, Washington, DC, USA. (Available from <http://worldbank.org/genderinag>) (Accessed on 31 October 2011).
- Yisehak, K. 2008. Gender responsibility in smallholder mixed crops livestock production system of Jimma Zone, South Ethiopia. *Livestock Research for Rural Development* 20(11).
- Young, H., Jaspars, S., Brown, R., Frize, H. and Khogali, H. 2001 Food security assessment in emergencies: A livelihood approach. ODI Human Practice Network, London, UK.

