

**Gender Issues in Irrigated Agriculture in
Tanzania:
A Case Study of the Lower Moshi Scheme**

A Research Paper presented by:

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in partial fulfilment of the requirements for obtaining the degree of
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

**Human Rights, Gender and Conflict Studies: Social Justice
Perspectives**
SJP

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The Hague, The Netherlands
December 2018

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Contents

<i>List of Tables</i>	<i>v</i>
<i>List of Figures</i>	<i>v</i>
<i>List of Maps</i>	<i>v</i>
<i>List of Appendices</i>	<i>v</i>
<i>Acknowledgements</i>	<i>vi</i>
<i>List of Acronyms</i>	<i>vii</i>
<i>Abstract</i>	<i>viii</i>
Chapter 1 : Setting the Scene	1
1.0 Introduction	1
1.1 Problem Statement	1
1.2 Research Objectives and Question	3
1.3 Justification of the study	4
1.4 Research Process and Methodology	4
1.5 Selection of Respondents and Data Collection	6
1.6 Analysing Data	8
1.7 Ethics and Positionality	8
1.8 Conclusion	9
1.9 Outline of Chapters	10
Chapter 2 : Women's Participation and Empowerment: An Overview	11
2.1 Introduction	11
2.2 Gender and Development	11
2.3 Does Women's Participation imply Empowerment?	12
2.4 Women and Land Ownership	15
2.5 Women and Access to Agricultural Technology	16
2.6 Women in Decision-Making	17
2.7 Conclusion	18
Chapter 3 : A Short History: Women and Irrigated Agriculture in Tanzania	19
3.1 Introduction	19
3.2 Irrigated Agriculture and the Tanzanian state	19
3.3 JICA, Women and Irrigated Agriculture	20
3.4 Gender, Irrigation and Liberalisation	21
3.5 Conclusion	22
Chapter 4 : An Overview: Gender Relations and Irrigated Agriculture in LMIS	24
4.1 Introduction	24

4.2 Profile of the respondents	25
4.2.3 Age of the respondents	25
4.2.4 Marital Status	26
4.2.5 Respondents' Dependents	26
4.2.6 Respondents' Education Level	26
4.3 Gendered Divisions of Labour in Lower Moshi	27
4.4 Gendered Access to Land	27
4.5 Access to Agricultural Technology	29
4.6 Women Leadership Positions in LMIS	31
4.7 Remaining Challenges for Women Farmers in LMIS	32
4.7.1 Women's Responsibilities in the Home	32
4.7.2 Women's Lack of Access to Credit and Capital	33
4.7.3 The need for Gendered Training Schemes	33
4.8 Conclusion	35
Chapter 5 : Analysis and Discussion of Findings	36
5.1 Introduction	36
5.2 Gendered Access to Resources	36
5.3 Participation, Networks and Empowerment issues	37
5.4 Conclusion	40
Chapter 6: Conclusions and Recommendations	41
6.1 Summary of Key Findings and Conclusions	41
6.2 Recommendations	41
References	43
Appendices	48

List of Tables

Table 1: A Typology of Participation	13
Table 2: Summary of the Interviewees	26
Table 3: Gender division of labour and level of involvement in agricultural activities	27

List of Figures

Figure 1: Farmers in the field demonstration	2
Figure 2: A woman working in a milling machine explaining the rice grading process	9
Figure 3: Women transplanting paddy	25
Figure 4: Paddy waiting to be processed	25
Figure 5 : Farmers at the training	34
Figure 6 : Weeding demonstration	34

List of Maps

Map 1: Location of the study Area	6
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List of Appendices

Appendix 1: Population of villages in Lower Moshi	48
Appendix 2: Cropping pattern of paddy at Lower Moshi scheme	48
Appendix 3: Lower Moshi map showing paddy cultivation areas (in Green) and maize cultivation areas (in yellow)	49
Appendix 4: Interview Guide for women farmers	50
Appendix 5: Guiding Questions for Focus Group Discussion- Women	53
Appendix 6: Interview Guide for Irrigators Association Leaders	54
Appendix 7: Interview guide for Government Officials	55
Appendix 8: Interview Guide for Kilimanjaro Agricultural Training Centre (KATC)	56
Appendix 9: Interview Guide for Women Leaders	57
Appendix 10: Interview Guide for Men	57

Acknowledgements

To accomplish my studies at the International Institute of Social Studies-Erasmus University Rotterdam was my long-time dream. I am so grateful to the Almighty God. I am so grateful to God for guiding and giving me strength to accomplish this thesis, it was not a straightforward endeavour. I deeply acknowledge the financial support I received throughout my MA studies from the Dutch government through the Netherlands Fellowship Programme (NFP), I am so grateful. I am thankful to the Dutch Foundation De Zaaier for financial support of travel costs for my empirical field work. I sincerely acknowledge and appreciate the guidance from my supervisors, Dr. Helen Hintjens and Professor dr. Karin Arts, for support from the proposal stage through field work and thesis writing, thank you so much. Thanks to the Director of Moshi District Council, the Principal of Kilimanjaro Agricultural Training (KATC), all the staff and the leadership of Lower Moshi Irrigation Scheme under the coordination of Mr Frederick Mawole for your endless support during my field work. I highly appreciated your support. To my friends Engineer Juma Mdeke, Mr. Dismas Rebero and Mr. Abdallah Ibrahim, I am so thankful for your support, comments and encouragement throughout my studies. This will always be appreciated. Thank you to all my Tanzanian and international friends away from home. I always feel relieved and taken care of when I received phone calls and messages from Masiye Mulenga Mwanza and Jovana Jeremic for checking on how I was doing every time even when things were critical to all of us, thank you so much. I give thanks to all those who contributed spiritually to my success. To my husband Ladslaus Onesmo thank you so much for your support during my studies, be blessed. Special thanks go to my mother Caroline Mushi, for her prayers, moral support, encouragement and for believing in me. Above all thanks for taking good care of my beloved son Ronel. I will always appreciate this, please be blessed. To my beloved son Ronel, I know how much you missed me and asked every time where mummy is. I am sorry for the time when I was not there for you, I love you son.

List of Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ASDP	Agricultural Sector Development Program
CHAWAMPU	Rice Farmers Cooperative Society (Chama cha Wakulima wa Mpunga)
FAO	Food and Agriculture- United Nations
HIV	Human Immunodeficiency Virus
ISS	International Institute of Social Studies
JICA	Japan International Corporation Agency
KATC	Kilimanjaro Agricultural Training Centre
LMIS	Lower Moshi Irrigation Scheme
MAFC	Ministry of Agriculture, Food Security and Cooperative
MLHS	Ministry Land and Human Settlements Development
MWI	Ministry of Water and Irrigation
ODA	Official Development Assistance
SAP's	Structural Adjustment Policies
SRI	System of Rice Intensification
URT	United Republic of Tanzania
WUA	Water Users Association
ZIU	Zone Irrigation Unit

Abstract

The underlying conceptual basis for this study is women's active and meaningful participation as one of the gender issues in agriculture. Taking the case of the Lower Moshi Irrigation scheme this study focuses on three interrelated aspects of participation against gender. These are: 1. access and control over land, 2. access over agricultural technologies and 3. women's position in decision-making processes. These three factors, determine the opportunities and barriers for possible women empowerment in agriculture. According to scholars the ways in which societies, customs and culture perceive women against men, have been quite awful; constraining the concerns and experiences of women in various socio-economic planned actions (Isinika and Mutabazi 2010, Chauvin et al. 2012, Kweka 1998). Tanzania land acquisition is informed by customary law, and its inheritance transfer goes through patriarchy which purposely excludes women. Women are positioned in the third category of land inheritance after the older and the youngest son. This form of discrimination and exclusion is codified under customary law.

With regards to land, translating initiatives into practice has remained a challenge (Irrigation Policy 2010: 38). Thus, the work of Naila Kabeer is used to interpret gender relations within the Lower Moshi Scheme in Tanzania. This is achieved through qualitative interviews centred on women's access to land, women's experiences in accessing and using technologies, and women's participation in decision-making. These interviews generated insights into the partial and sometimes ineffective ways that women seek control over land, technology and decision making, and highlighted the often-limited possibilities for women's empowerment within the Lower Moshi Irrigation Scheme.

Relevance to Development Studies

The role played by women in agriculture is very crucial all over the globe. Policy makers internationally and regionally put more emphasis on enacting laws and policies, which increases the meaningful participation of women in agriculture. This means to increase the number of women owning the means of production, which is the key to their bargaining power and leads to empowerment, poverty reduction and households' economic growth. The Japan International Cooperation Agency (JICA) has been supporting development programmes since the 1960s, this includes Tanzanian rural development and has been sending its expertise since that time to support agricultural production across the country. The question, that remains, is whether such long-term development aid can also empower women, given the growing awareness of the importance of gender equality for sustainable development. The question is whether such long-term development aid can also empower women, given the growing awareness of the importance of gender equality for sustainable development.

Keywords

Participation, JICA, Gender relations, Land, Gender, Irrigation, Lower Moshi, Tanzania.

Chapter 1 : Setting the Scene

1.0 Introduction

Irrigated agriculture is a main contributor of food security to Tanzania and socio-economic development. Gender issues have been a major concern for many governments with steps being considered to implement strategies, laws, and policies to ensure that women issues are addressed. Tanzania has been responsive in developing gender- responsive irrigation policies. In 2010, the country set out measures to respond to matters of gender inequality in food security, gender reduction, as well as poverty reduction to complement previous irrigation policies such as the Irrigation Policy, Agricultural Sector Development Program (ASDP), Agricultural Policy, Rural Development Strategy and Tanzania Development Vision 2025.

It has been a challenge achieving the goals of these initiatives, as customary law is the primary determinant of land acquisition. This means that it is not easy for Tanzanian women, especially women farmers in the Lower Moshi area to acquire land as they are placed third in the inheritance line with the sons coming second. Therefore, they lack the control over irrigation as they cannot independently inherit or buy land. Women remain marginalized in Tanzania and failure to involve them in agricultural activities has resulted in a food shortage. When women are integrated in agriculture, several advantages such as improved agricultural output, operations, and food security are experienced as well as women's overall empowerment.

1.1 Problem Statement

Irrigated agriculture contributes highly to socio-economic development and food security in Tanzania (Temu et al. 2005). The 1992 Dublin Conference on Water and Environment, urged governments to enact laws, policies and strategies to ensure gender issues are incorporated into water development programmes. In general, the government of The United Republic of Tanzania (URT) responded by developing an irrigation policy addressing gender inequalities in poverty reduction and food security (Irrigation Policy 2010: 38).

Translating this initiative into practice has remained a challenge and the results are minimal, especially with regards to land (Irrigation Policy 2010: 38). Tanzanian land acquisition is informed by customary law and its inheritance transfer goes through patriarchy that purposely excludes women (Isinika and Mutabazi 2010, Chauvin et al. 2012, Kweka 1998). Codified by the laws women are placed in the third category, with the eldest and youngest sons first and second in priority respectively.

Due to this patriarchal tradition, laws and constraints to resources women are forced to take a subordinate position in this scheme, hampering their access to land acquisition, economic opportunities, resources and power in decision making thus restricting them to meaningful participation in the scheme. Whilst knowing the advantages of integrating women into agriculture, such as improved food security in households, increased agricultural activities and enhanced output performance, women continue to suffer exclusions at all levels of this

scheme. This requires strategic interventions that will stir changes and impact reforms legally, culturally and politically (Chauvin et al. 2012).

With a failure to access land or resource opportunities to tenure land, women's benefits and or profits are affected by acquiring small and less productive portion of lands. As in many communities' irrigation is considered a male activity, women are denied equal representation and space in decision-making bodies. This results in limited participation of women in influencing processes, which could result in shaping gender friendly programmes. Unless women are given equal access and control over land, resources, decision-making opportunities and technology the world will go on witnessing food shortages in various rural communities (Sheridan 2002).

This research explores the meaningful participation of women in the Lower Moshi Irrigation Scheme (LMIS hereafter) with regards to their opportunities and constraints to (i) access land, (ii) benefit from agricultural technology and (iii) to take part and engage in decision-making roles in the project. The LMIS case study is in the Moshi district, of the Kilimanjaro region. It has been operating since 1987, however for the purpose of this study I concentrate on irrigated agriculture in light of gender since 1997 to date when the government enacted laws and policies which address discrimination against women.

Figure 1: Farmers in the filed demonstration



Source: Voice from the Community Report (2014: 4)

The picture above shows farmers from LMIS during a field demonstration, which equips farmers with skills on how to follow good agricultural practices, which in turn helps them to meet the standard productivity of the scheme. The training is conducted by the scheme's technical staff and Kilimanjaro Agricultural Training Centre (KATC). KATC was established by JICA with the aim of delivering training to farmers and government staff. Field trainings are conducted at the beginning and middle of the cultivating season.

1.2 Research Objectives and Question

This research aims at exploring women's participation in irrigation and how their participation leads to their empowerment. The analysis is based on how women access and control land, access agricultural technology and exercise decision-making in the scheme.

This research was conducted in an area where land used to be owned, inherited or attained through clanship. The system was manned in a customary way under a chieftaincy, whereby surrounding natural resources and systems were owned by the chief. This customary resource ownership system was adapted during the colonial era and post-independence (MHLS 1997). As stated earlier, inheritance is a patriarchal system, in which favour is given to the male descended line and purposely excludes women.

The method used in this study was interviews; questions were designed to glean information with an objective of contributing to the on-going debate in the development discourse on the ways in which women can be effective in irrigation agriculture and how this leads to empowerment. To this end, this study attempts:

1. To understand how gender participation is conceived and practised in the LMIS scheme and contribute to discussions on whether women's participation in development projects have empowering effects.
2. How are gender-related issues conceptualized and practiced in the LMIS to allow for women's participation? What are the empowering effects (if any)?

The research questions above are supported by the following sub-questions:

- How is access to resources such as land, credit and agricultural technology gendered in the LMIS?
- How is gender conceptualised in the LMIS, and whether this conceptualization allows for women's voices to be heard in the decision-making processes?
- What is the role of class, education and age in mediating the participation of women and men in accessing technological know-how, the land and decision-making processes of the scheme?
- What are the main factors that influence women's achievements and failures in the LMIS and in its management?

1.3 Justification of the study

The pillar of rural food security is argued to be contributed highly by women (Bhat et al. 2012, FAO 2011). Evidence shows that in Tanzania women have an important role in agricultural production, making up 54% of the workforce (Leavens 2011: 1). This shows that not only does agriculture have woman-intensive labour, but also that the importance of this role is reflected worldwide. Thus, policymakers need to pay more consideration to the gendered nature of agricultural production, with the aim of ensuring that women are not left behind in terms of benefits and recognition. In Tanzania, despite women making up most of the rural workforce, in most existing irrigated agriculture schemes, women are barely mentioned, and so remain unrecognised, not counted and undervalued (Bhat et al. 2012; Ahmed et al. 2012, Farid et al. 2009, Singh and Vinay 2013).

This explains the importance of Gender Studies in Agriculture today. This research will not only contribute to knowledge on development and agriculture, but will also allow development partners such as JICA, policy makers in relevant ministries such as the Ministry of Agriculture and Irrigation, and the public at large to understand the constraints facing women in irrigated agriculture (Lynch 1991, Agarwal 1997a, Kuwornu and Owusu 2012, Zwarteeven 2010).

1.4 Research Process and Methodology

This section demonstrates research steps, research area, techniques for data collection, selection of respondents, secondary data, data analysis, scope and the limitations of the study. It also observes ethical consideration and the researcher's positionality. Qualitative methods were used to discover the socio-cultural factors dominating the LMIS and women's possibilities for empowerment in particular. I went through all necessary procedures as a prerequisite to the ethics for conducting such a study. While in the study area, I had permits from relevant authorities, such as a permit from the Executive Director of the Moshi District Council, though the process of acquiring the permit took me more time than anticipated. I also had a letter of introduction from the International Institute of Social Studies, which introduced me in different areas where I went to for data collection. In terms of the selection of the case study, the LMIS, which is located in the Moshi Rural District, of the Kilimanjaro region, which borders Kenya on the north, was an obvious choice. This is a long stand scheme and being viewed as one of the most successful of the seven JICA-funded irrigation schemes. My question was – if gender equality could be managed anywhere, it should be managed here. Paradoxically as this study shows, this was not the case, overall.

Located in one of the richest agricultural zones of Tanzania, bordered by the Arusha region to the west and Tanga region to the south-east. The Kilimanjaro region is made up of six districts namely Mwanga, Same, Moshi Urban, Moshi Rural, Rombo and Hai. The Lower Moshi irrigation scheme is about 26 km south-west of Moshi town, which is the headquarters of the Kilimanjaro region. Currently, Kilimanjaro hosts several ethnic groups, these consists of the Pare, Sambaa, Sukuma, Kahe and Chaggas. However, the Chagga ethnic group occupies large parts of the region, followed by the Pare and other

tribes from different parts of the country. Having been the majority, the Chagás influence other heterogeneous groups in the region in terms of beliefs, customs and tradition (Kissawike 2008: 6).

The selection of this study area predominantly was based on the few older developed schemes in the country since 1987. It was developed, maintained and executed with the support from Japan International Cooperation Agency (JICA). JICA provides technical cooperation, Official Development Assistance (ODA) loans and grant aid to many developing countries since 1954. JICA's corporation intend to contribute to the peace and development of the International society, and hence also to Japan's security and prosperity. It was introduced in Tanzania, when the country was hit by drought effecting food insecurity in 1970's. After the drought in 1974/1975 the government of Tanzania decided to expand irrigation for food security assurance. Lower Moshi scheme was developed, it was supplied with modern agricultural and infrastructural technologies. The scheme is characterised by high yield due to good rice cultivation practices, good maintenance and management of irrigation technologies.

The LMIS extends along four villages, Chekereni, Mabogini, Oria and Rau Rivers. The scheme is divided into three parts:

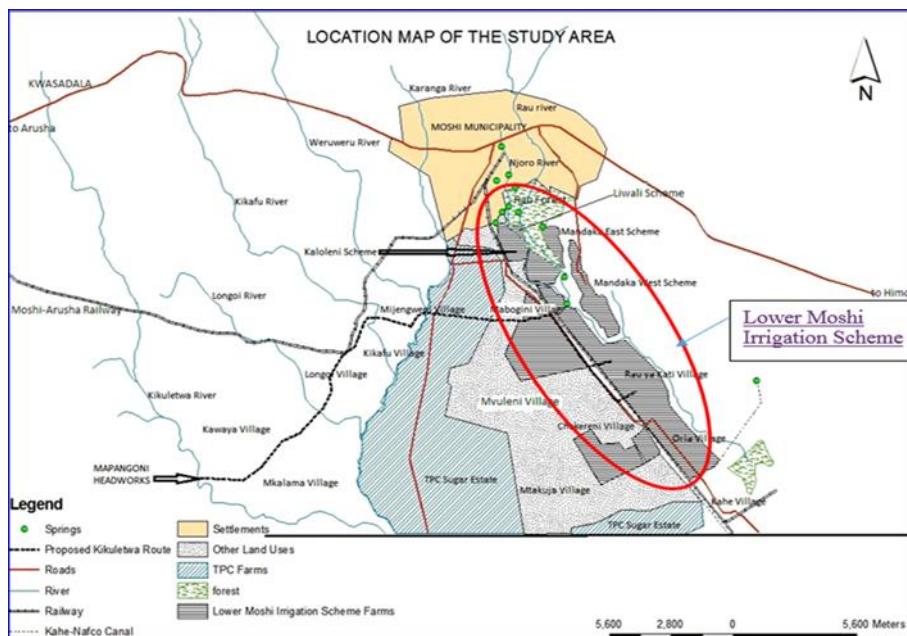
- i. Agricultural crop production
- ii. Forest reserve/grassland
- iii. Villages and settlements

The forest covers a total of 623 hectares, agricultural production covers two sections one being rain-fed (maize, sorghum groundnuts and sunflower), which covers 1,200 hectares and irrigated agriculture with 1,100 hectares which are divided into 0.3 hectares plots, for the cultivation of paddy (Kissawike 2008).

The scheme has three overlapping cropping patterns which starts from; January to May/June, May to September/Oct, September to January/Feb. The scheme once practised traditional irrigation, before the government of URT entered into a rehabilitation agreement with the JICA in 1977, which included loans and aid from Japan used to develop the 2,300 hectares (Ampia 1996). The main goal of the scheme rehabilitation was to develop its infrastructures to increase yield, thereby creating employment, water efficiency and food security in households.

Working in the Northern region where the LMIS is located for three years, I experienced how women farmers in the different schemes where training was conducted, put their efforts in farming different crops like paddy, maize, beans, onions, tomatoes and cabbage and at the same time they encountered dilemmas in accessing capital, agricultural inputs and services which limited their active production. Thus, in this study I would like to highlight the ways in which meaningful women participation leads to empowerment, achievements, challenges and failures if any, in the LMIS.

Map 1: Location of the study Area



Source: Kissawike (2008: 3)

1.5 Selection of Respondents and Data Collection

In this study purposive, snowball and random sampling was used. The aim was to capture all the key beneficiaries in the four villages around the LMIS and those indirectly having a connection with the study area, especially in land allocation and acquisition. Some of those who had knowledge about the operation and background of the scheme were also consulted. I applied the snowball sampling technique, which “involves building a sample through referrals” (O’Leary 2014: 190). However, with this method I encountered a challenge, as respondents at the beginning were hesitant to give referrals. Nevertheless, snowball sampling was preferable to being put in touch with ‘handpicked’ male and female informants through the scheme manager. Also, by using beneficiaries in the scheme – including those from other regions – as well as locals who were in the area before the development of the scheme took place, the aim was to capture valuable information and understandings in practices of gender in Lower Moshi.

During the interviews I introduced myself to the respondents provided them with an overview of the study, encouraged their active participation and informed them that if they were not comfortable they could leave (Laws et al. 2013). This allowed the respondents to relax and open for the session, however, the question of my work experience arose, and the experience of working in one of the irrigation projects led respondents to think that I came from the JICA office. I had to explain the intention of my study more clearly, because some of the responses and recommendations were given with an emphasis that I should communicate with my bosses in JICA for them to get assistance.

The respondents were organized in five different groups depending on the category, and all were from beneficiary villages. I had a group of seven women farmers, seven women leaders, seven male farmers, six irrigator association leaders, four government officials and one focus group discussion (FGD).

Though the plan was to have 44 respondents, however, the study ended up with 37 respondents which is a reasonable number. This was due to the time arranged for data collection, which coincided with the time for transplanting rice in their fields. Also, I missed some of my interviewees who had special tasks in one of the farmers public events known as NaneNane commemorated every 8th of August, which made me miss six respondents. During the interviews different questions were asked to understand how women participate in the project in relation to the three aspects of access and control of land, access to agricultural technology and women's position in decision-making.

The ages of the 37 respondents ranged from 30 to 68 years. This indicates that most paddy farmers in the LMIS are at the productive age, where they can engage themselves in different economic activities for their development. However, this study shows that there are very few numbers of youth below the age of 30 years who engage themselves in paddy cultivation. In addition, relocation of youth from rural areas to urban centres and cities for education, greener pastures and livelihoods, means that this age-group was absent from the sample.

In terms of data collection, the study utilizes interviews, FGD and observation. Interviewing allowed individual respondents to narrate their own experiences in their own words. The FGD provided critical discussions, views, perceptions, feelings and attitudes towards the raised gender issues surrounding them (Laws et al. 2013: 300). Also, during the interviews, the researcher observed body language and other activities, which were going on in the field area.

Further information was obtained from secondary data sources by reviewing archives, relevant scheme reports, and documents on gender profiles and policies from the Ministry of Agriculture, Ministry of Water and Irrigation, Ministry of Land and Housing, JICA, World Bank, IFAD, KATC, and FAO. The literature reviewed provided more insight into the understanding of irrigation in the Tanzanian settings.

Observation was also an important means of verifying information from interviews and other sources. During data collection, I conducted an observation exercise, with the aim of getting more understanding of the study area and the context in which people were working and making decisions. The exercise was conducted in the four villages included in the scheme. Every day, I would go around villages and randomly talk with farmers, women and men, in a random way. I also observed working patterns, the daily routines, who attended meetings, and the profile of different activities during the day. I noticed that women worked earlier than men, that is, whilst men worked in the evenings, women were up and working early. This method of directly observing and informal discussion provided the researcher with a chance to see and understand whether what respondents said in interviews was mirrored in their daily lives. This method helped to generate quite a lot of data in a relatively short time. However, its main disadvantage is that the researcher's presence in the environment observed could have also influenced what happened in that environment (Laws et al. 2013: 304).

1.6 Analysing Data

In this research qualitative data was generated from interviews, FGD, observations, reports, evaluation documents and other sources. The data was analysed using thematic analysis, which is a “method that works to reflect realities and to unpick or unravel the surface of reality” (Braun and Clarke 2006: 81). The analysis process included data arranging, understanding the data collected, interpretation of data, data coding, respondents’ categorization, and development of themes. Thematic analysis is applied in this study because of its usefulness in analysing respondents’ experiences, perceptions, different narrations and their everyday life in the scheme. As this method allows the researcher to decide the themes, themes were determined in relation to the research question (Braun and Clarke 2006: 82). In this research mainly, qualitative data was generated; some quantitative data was obtained from reports, evaluations documents and other sources. Analysis process used; thematic narrations from the respondents’ data who were mostly farmers. Thematic analysis is a “method that works to reflect realities and to unpick or unravel the surface of reality” (Braun and Clarke 2006: 81).

1.7 Ethics and Positionality

The research commenced after approval from the International Institute of Social Studies (ISS), Erasmus University Rotterdam. An introduction letter was submitted to the Moshi District Council asking for permission to collect data in the areas under her authority. The letter explained the study is for academic purpose only. The purpose of the research was communicated openly at all levels, to all the respondents and respondents were informed that they were free to leave at any time during the process. All the respondents participated voluntarily. Additionally, in Lower Moshi the farmers are accustomed to receiving different researchers for different studies.

During the data collection I used a voice recorder and before recording I asked each respondent for their approval to record. Respondents were informed that the information they shared would be used for academic purposes (Laws et al. 2013). Interviews were conducted in Swahili, a widely spoken language in Tanzania and was then translated to English. I compensated my interviewees either with lunch or breakfast, depending on the time of the interview. With government officials, I thanked them for their cooperation in my study through a written letter.

Figure 2: A woman working in a milling machine explaining the rice grading process



Source: Field Data 2018

The above picture shows a woman who works in one of the private milling machines in Lower Moshi. After milling paddy is graded by machine into three grades, the milling and storage facilities in LMIS are owned by private individuals. This means that after grading, storage must be paid for by farmers as an additional service. Storage services were previously provided by the Rice Farmers Association (CHAWAMPU) before it ceased operating in 2000. After this time, the storage warehouse was taken over from the farmers and became part of the Tanganyika Coffee Curing Company Ltd.

1.8 Conclusion

This research explores how gender is conceptualized in the LMIS and if such a conceptualization allows women to make main decisions. Factors such as age, education, and class were also considered, as well as the key aspects that affect the achievements and failures of women in the management of LMIS. The fact that women have less or no control over productive resources forms the basis of this research. Chapter two is a theoretical framework of the analysis whereby concepts, as well as their definitions, are discussed. The framework is built on existing theories and references relevant to the study. The chapter demonstrates a clear knowledge of theories relevant to the research topic and those that connect to the wider areas of data being considered.

1.9 Outline of Chapters

This paper is organized into five chapters. The first chapter sets the scene of the study topic on gender issues in irrigated agriculture. The second chapter gives an overview of women participation and empowerment, and the framework used to analyse the participation of women in irrigated agriculture. The third chapter provides information on the history of women in irrigated agriculture in Tanzania. The fourth chapter provides research findings and analyses the factors that lead to low levels of participation of women in LMIS. The fifth chapter presents the study discussion, conclusion and gives policy recommendations.

Chapter 2 : Women's Participation and Empowerment: An Overview

2.1 Introduction

The concept of participation is introduced and used to explain irrigation schemes as not only physical but also social. As defined, participation is the act of keeping people involved to ensure they respond to development (Hulsebosch and Ombara 1995: 6). Participation is essential in communities as it drives change. Since people belong to different classes in society, each member can be integrated in a holistic manner. This enables the provision of equal opportunities for every member to be involved in decision-making processes whether passively, actively, and interactively among other types of participation.

Several concepts are used to bring an understanding of the topic of study. The first is the empowerment theory; empowerment is defined as the process through which people who cannot make informed life choices are given the ability to do so (Kabeer 2010). This, regarding the issue of women participation in the LMIS, explains how gendered Moshi irrigation scheme is and whether empowerment is a crucial area of focus in the development of the project. Gender relations show how issues such as division of labour, decision-making and allocation of land depend on gender across different societies (Bayeh 2016: 36). Especially in patriarchal societies, women are denied the right to give their opinions especially in developmental matters. In LMIS women are discriminated against, as working in irrigation schemes is viewed as the work of men. In Tanzania, land belongs to men. In Tanzania, land belongs to men despite the 1999 Land Act which gives women chance to own their own land, this did not work in LMIS since all the land is under control and, largely with men.

2.2 Gender and Development

Gender relations are established and supported to constitute ideologies using other structures of social hierarchy in society like race, class, ethnicity and caste, it differs from one society to another and despite being fluid some of the gender inequalities persist (Agarwal 1997a). Different international platforms such Women in Development, Women and Development and Gender and Development are used to advocate for more inclusive policies and institutional changes which accommodate women into economic systems. Hence development agencies in the 1970s adopted approaches and perspectives to reshape their development policies (Rathgeber 1990: 490).

In patriarchal societies women's voices remain unheard and thus, they are unable to inform policy development in their communities. Social norms and tradition shape and inform the roles and responsibilities of women and men in the community (Upadhyay 2003: 508). However, gender mainstreaming has emerged not only as an approach for dismantling the barriers that women face that advance gender inequalities but also as an avenue for formulating gender-sensitive policies that are considerate of the challenges faced by women while transforming institutional practices that are male-oriented (True 2003: 369). The Beijing Platform for Action Forum in 1995 provided the motivation for

advancing mainstreaming as a transformative agenda targeting gender issues. The transnational networks that have been created by women's organizations have changed the way women participate in policymaking and in addressing issues that affect them regardless of their level in society (True 2003: 377).

Different stakeholders in society have their way of fighting for women's position in society. Gender systems are quite challenging because they are influenced by traditions, norms and societal customs, this makes the strategies and actions needed to empower women, to differ from one society to another. Relatedly, in different societies women face different levels of inequality, for instance in the LMIS married women farmers have access to irrigated land and the chance to participate in decision-making, however they are disempowerment when it comes to controlling the produce and income. As pointed out by the respondents, it is uncommon for a wife and husband to make equal decisions on the farm income, as husbands often take decisions on their own. Husbands sometimes sell family crops without their wife's consent and the money goes into his pocket. Indeed, gender mainstreaming has seen the development of gender sensitive policies in many countries that ratified the resolutions made at Beijing. Zwarteeven (1994:14) points out that in African settings irrigation schemes fall into three assumptions:

“Male heads of households control farm resources and labour, improved income of male farmers will automatically reflect in the life of the entire households, farm households are comprised of nuclear families”.

2.3 Does Women's Participation imply Empowerment?

Since irrigation activities involve people and the environment, they are not operating in isolation but rather together. Nevertheless, the word participation is common in the development arena, and since the 1970's has been discussed in different contexts. The emergence of the concept participation which promotes alternative lateral or inclusive development posed a challenge to traditional development practices and interventions especially to those governments who favoured the top-down or vertical development approach (Oakley 1991). Participation has been defined differently by Uphoff;

- “Participation means sensitizing people to make them more responsive to development programmes and to encourage local initiatives and self-help” (Uphoff et al. 1979: 168).
- Participation means “involving people as much as possible actively in the decision-making process which regards their development” (Uphoff et al. 1979: 168)

Wambali (2009: 204) defined participation as “the freedom to make meaningful choices between various options [as] the essence of development and [a] precondition for personal well-being ... to ensure the quality, appropriateness and durability of improvements”.

Effective participation to respective beneficiaries in the community not only affects development changes but participation is then conceived as a human right to development with respect to beneficiaries' ideas and interests (Oakley 1991: 8). Societies are heterogeneous, they cannot be viewed as an integrated organic whole (Agarwal 1997b). There are different people belonging to different social

classes, regardless of those who are strong, weak, marginalised, influential etc., participation seeks to integrate every member of society in a holistic manner. According to Oakley (1991: 8) participation generally can be a “means and an end to development”: Means - people controlling social and economic resources to be able to achieve the desired results while the end is reflected where people are motivated to be part of development programmes.

A typology of participation is provided by Agarwal (2001: 1624) and is presented in Table 1 below. Participation in development interventions has become mandatory in many development programmes, from designing to monitoring of the project (Agarwal 2001). Nevertheless, Agarwal (2001) argues that participation can take different forms from the higher to lower level, although the shift from one step to another depends on one's efforts.

Table 1: A Typology of Participation

Level/ Form of Participation	Characteristic Features
Nominal Participation	Member in the group
Passive Participation	Being informed of decisions ex post facto: or attending meetings and listening in on decision making without speaking up
Consultative Participation	Being asked an opinion on specific matters without guarantee or influencing their decisions
Activity/ Specific participation	Being asked to (or volunteering) to undertake specific task
Active Participation	Expressing opinions, whether or not solicited
Interactive(Empowerment) Participation	Having voice and influence in group's decision

Source: Agarwal (2001:1624)

The concept of participation is used in this study to understand the role played by women in the LMIS. The study will explore in general how women's active participation brings about structural change in light of women's empowerment, and in particular how women participate at different levels of the LMIS from design to monitoring. Relatedly, participation is used to find out to what extent the Land Act, irrigation policy and agricultural policy have paved a way for access and control of land, and for its use as collateral for bank loans.

The ability of participation to generate 'genuine' local empowerment depends largely on those involved in the development project. The tendency is for men to participate more than women, that the better off are involved more than the worse off, and those groups with higher level of economic and social status rather than those in the lower status. While participation can form and generate empowerment, participation alone is not adequate and can be passive, rather than active and based on community control. It can be used to assure program efficiency rather than empowering the community to reduce social and economic exclusion.

Naila Kabeer's (2001: 35) definition of empowerment as "the process by which those who have been denied the ability to make strategic life choices acquire such ability" (Kabeer 2001: 35).is employed this study. Kabeer (2001) further articulates the ability to make choices into three interconnected concepts:

- Resources, which facilitate the capacity to make choices. Kabeer (2001) refers to resources as tools available for actors to access (materials, human and social resources).
- Agency, relates to the decision-making process. Agency is viewed from the actor's perspective, to utilise the choice of change.
- Achievement is when the individual is ready to use the acquired agency to work differently and improve their life; therefore, empowerment is a process and a result.

The empowerment framework is helpful in understanding how women empowerment is guaranteed following the interrelated concepts of resources, agency and achievement. The three elements provide a clear view of women in the LMIS and help to reveal other social conditions in the community. Empowerment at the individual (woman) and community level depends on the environment. The framework provides insight on how the scheme is gendered and whether empowerment is a focus in the establishment of the scheme.

Kabeer's (2001) three interconnected aspects of women's empowerment lend themselves very well to Agarwal's concept of participation, and I use them together to assess the extent to which women are participating in the LMIS, and whether their participation results in the empowerment of women. Kabeer's (2001) concept of resources refers to material, human and social resources. Being a member of a group and being informed about decisions and events represents nominal and passive participation but can also be a social resource. However, being able to acquire technical expertise and know-how through training would presumably place women in a better position to express their opinion and thus enable them to take up an active and meaningful role in the processes important to the community. Thus, resources of empowerment are related to the level of participation.

The same can be said about the relationship between agency and participation. Agency according to Kabeer (2001) is participation in decision-making processes – and that is the highest level of participation that Agarwal (2001) sees as empowering. It will be important to see also what kind of decision-making processes women engage in, as it is reasonable to assume that there will be a hierarchy among the things the community considers important. Likely women and men may not consider the same things important, as there are 'women's issues' that are left to women to decide, while men decide on the 'important issues'.

Finally, Kabeer (1999) speaks about achievements as the ability to do things differently and considers this an important aspect of empowerment. In this study I investigate whether women have gained the possibility to make 'strategic life choices' (Kabeer 1999). In this way, the highest possible level of participation - empowerment - can also be achieved. This is tested by looking at whether women achieved access to land and acquired technological knowledge as resources that allowed them to make strategic choices and do things differently.

Combining these two frameworks allowed for an understanding of women's participation in the LMIS and whether this had any empowering effects.

2.4 Women and Land Ownership

Isinika and Mutabazi (2010) focus on how the land tenure system in Tanzania prescribes access, disposal and exclusion. There are many advantages of integrating women into agriculture, such as improved food security at the household level, increased agriculture performance and can lead to changes in the legal, cultural, and political systems (Chauvin et al. 2012, Kweka 1998).

Land ownership is the most critical factor that determines the extent to which individuals practice irrigation. Meinzen -Dick et al. (2017) argue that land ownership means that the owners have specific rights not only to use the land for different purposes, but also a right to sell or lease, and accrue benefits from the land. In Tanzania, land ownership for women has been complicated as existing laws exclude women from land ownership (Shivji 1998: 65). Tanzania, after gaining independence from the British colonialists adopted the Ujamaa model, which is a socialist, land ownership model that provides equal land ownership to all Tanzanian families (Shivji 1998: 65). The Ujamaa model advances the communal land ownership ideals whereby communities control and make decisions regarding land ownership in a bid to provide families with equal opportunities to have access to land and land use (MLHS 1997: 12). Land ownership is significantly influenced by customary laws, which place inferior land rights upon women (*ibid* 1997). The assumption, behind the customary law which denies women's land rights is based on the belief that they will get married to another family and possibly inherit land from the husband's side and not transfer the family land to a new place (MLHS 1997).

Thus, in distributing land to villagers and households, community leaders have discriminated continuously against women, thus depriving them of land ownership (Shivji 1998). However, women in Tanzania are provided with alternative legal avenues through which they can obtain land ownership in addition to their security of tenure through purchase (MLHS 1997: 12). Women are also entitled to land ownership through family and communal allocations, even though the customary laws remain highly discriminative when it comes to land inheritance (Tenga and Mramba 2008: 163). However, the Tanzanian Constitution does give women the right to own land through allocations and inheritance; but the problem is, it has weak measures to enforce the law (MLHS 1997). Hence, women in Tanzania depend, for their livelihood, on lands owned by their family members, communities, or even women groups, thus enabling them to practice agriculture even though their land ownership is limited effectively.

Despite the above-mentioned importance of women in irrigated agriculture Zwarteeven (2008), points out that water and development discourses are still informed by the colonial context. Zwarteeven (2008) highlights the unheard voices of women in water user committees and how irrigation water is highly gendered and surrounded by myths, taboos and norms that tend to reduce women's contribution in irrigated agriculture. In Turkana and Samburu in Northern Kenya, "a woman who has given birth to twins or had a breach birth, is not even allowed to touch the water in a furrow" (Zwarteeven 2008: 124). This

taboo excludes women from irrigation schemes. Therefore, any challenges faced with furrows like leakage or reservoir breakage, is blamed on women who have broken the taboo. Similarly, women who interfere with the furrows, are said to be affected by either having problems during birth, infertility, bleed to death or give birth to a deformed child (Sheridan 2002: 88). The land issue for women has historically raised questions of equity and participation. Bayeh (2016) has argued that in many African countries the land system is still male-centred, and women are given very little power and consideration in terms of participation.

2.5 Women and Access to Agricultural Technology

Agriculture extensions, through access to new technologies, inputs and support of its application has been crucial in promoting agricultural productivity, ensuring food security and promoting rural livelihoods. Water management has proven a major pre-condition as far as agricultural growth is concerned (Ahlers and Zwartveen 2009). Agricultural sector of most developing countries, has been indicated that, rain-fed farming practices are associated with low productivity. However, this is not universally agreed upon, especially farming in hilly areas, where rain-fed farming may result in less environmental damage than irrigation. However, such a position explains the current shift to new agricultural way of farming. The technologies that are increasingly being used tend to encourage women to shift from animal-drawn practices to automation of processes as a way of speeding up operations.

Nevertheless, the use of technology distinguishes between the irrigation performed by women from that performed by men (Theis et al. 2018: 3). Notably, Tanzanian women tend to use manual forms of irrigation such as water cans and hose pipes, compared to their male counterparts, who use water pumps, sprinklers, and other forms of irrigation technology to carry out commercial farming (Hulsebosch and Ombara 1995: 14, Tagseth 2008: 466). Therefore, it can be assumed that most Tanzanian women farmers use irrigation to produce food to be used in their households, as opposed to producing food for commercial purposes (Oates et al. 2017: 21). An example Zwartveen (1997: 1337) narrates the case of Burkina Faso where women use water for cash crops businesses, which are not recognised. The women are mistaken as food crop growers, organised in groups and given a small portion of irrigated land for vegetable cultivation.

Moreover, women who use irrigation for commercial farming do so in their capacity as subordinates to their male counterparts in their families or communities. Hence, the majority of women who purchase farm machinery to be used in irrigation do so on behalf of their husbands or family male counterparts (Zwartveen 2008: 113). Despite having fewer women who engage in irrigation for commercial purposes, there are a few who do manage to sustain their families from the proceeds of their farming because of irrigation.

2.6 Women in Decision-Making

Gender in irrigation is not a new phenomenon, it has been well-researched by various scholars and practitioners across the globe. Therefore, almost all governments around the world have established policies and guidelines incorporating women's role as farmers, producers, and technology users. Thus, women have been recognised as active agents in processing, storing and marketing products, in areas including crops and livestock. Yet, the paradox of its application persists. Agarwal (1997b) argues that, land and forest have been necessary for women in the provision of their basic needs. Though the removal of communal land rights and management to state-owned, poses a challenge around the idea of women's participation and equity. Women cannot afford individual land ownership, especially whilst ideas about traditions, customs, norms and power relations hinders women's access to and control of land (Kuusaana et al. 2013, Duncan 2004).

In most patriarchal societies, women occupy a precarious socio-economic position. Their family realities imply that they have little say regarding decision-making processes, and as such, most of their socio-economic needs go unmet. Admittedly, they have very little access to the already limited resources because the male head of a household often determines their overall economic contribution (Agarwal 1997b). Women's workload is heavier even though this position is rarely reflected in their economic status. There are still numerous areas for effective participation of women in agriculture that must be addressed including family relationships, social realities, land-holding customs, and the power structures within and between households (Agarwal 1997a, Namubiru-Mwaura 2014, Franco et al. 2015).

Family realities have particularly constrained any access that women have towards scarce resources. What the irrigation projects fail to consider is the fact that a household, in a rural setting, does not represent a unit of convergent interests. Most of the benefits that are given to a family are rarely distributed equally (Meeker and Meekers 1997). This position is made even more confusing by the complex nature of relations within households, women do not have the same control and access as men regarding the means of production (Bremner 2012, Croppenstedt et al. 2013).

In a patriarchy setting, decision-making is a delicate balancing act for women. Most of the current irrigation projects need to be revisited if women are to stand any chance of having their voices heard. The major areas that should be addressed, with regards to irrigation and agricultural resources, include educational opportunities, income-earning opportunities, household work, and food production (Kuwornu and Owusu 2012). For women to be heard in decisions that affect their social and economic standing, there needs to be empowerment through learning opportunities (Zwarteveld 2010). This can be achieved by removing gender-related barriers, which hinder women's chances of excelling in the different aspects of life (Kabeer 2016). However, empowerment itself cannot bring change in the lives of women. According to Kabeer (2008) for women, being empowered, allows her to fully participate in society, because empowerment intersects with other factors in society like class, ethnicity and context, therefore women being empowered means women can exercise their agency and speak out on issues of their concern.

2.7 Conclusion

Empowering women to participate in irrigation schemes has proved to be advantageous as productivity has increased. From the above discussion, the discrimination that exists in the irrigation schemes is founded on gender stereotypes, cultural practices, and norms, which should be challenged to ensure that women participate actively in such projects. To help women access agricultural technology, they have been urged to embrace technology to speed up agricultural operations and increase output. Women, as earlier stated, were not involved in decision-making; however, today's system allows them to participate in irrigation and in shaping advancement programs to ensure that their issues are addressed. They should be recognized and given a platform where their grievances are heard. The next chapter explains how irrigation schemes in Tanzania began, how JICA has intervened in the irrigation system, how irrigation in the country is managed, the involvement of women in irrigation, and the issue of women and land ownership.

Chapter 3 : A Short History: Women and Irrigated Agriculture in Tanzania

3.1 Introduction

Below is an overview of irrigation in Tanzania and how it has grown to date. Irrigation was introduced in Tanzania in the 1960s during Mwalimu Nyerere's rule to meet the food demand for in the country. During this period, gender equality was not an issue of debate. Tanzania is an agro-based economy like many other sub-Saharan countries. Since most of the farming depends on rainfall, which is unreliable, different solutions like irrigation have been proposed to improve production. Irrigation in the country is used for small-scale agriculture. The most notable aspect about small-scale irrigation farming is that more women are involved in the practice compared to men. As result, women supply the food and raise money for their families and educate their children, yet the voice of women in water usage remains unheard in the country.

Tanzania has received support from JICA for the past 31 years and has established 16 projects with 6 model projects including development of the LMIS, which supports irrigation and paddy production. JICA takes into consideration issues of gender equality and empowers women to take part in agricultural production. Irrigation is managed by the Ministry of Agriculture to ensure the issue of food insecurity is addressed. A National Irrigation Policy has also been put in place to ensure irrigation projects are effective.

3.2 Irrigated Agriculture and the Tanzanian state

Irrigated agriculture in Tanzania can be traced back to pre-colonialism. Farmers had different traditional irrigation systems which, varied from one region to another. Nevertheless, German missionaries in Tanzania introduced cash crops and Northern Tanzania was developed as a plantation colony for sisal, tea, and coffee. The Arabs in the period of the slave trade introduced rice cultivation (Kissawike 2008, Ongutu 1972). After independence in the 1960s, during the time of the first President Mwalimu Julius K. Nyerere priority was given to village irrigation schemes. At the time almost 5,650 hectares of irrigation land was developed by the Ministry of Agriculture and Cooperatives. The main goal was to ensure the improvement of traditional agriculture, which was not functioning or meeting demand (Mascarenhas et al. 1985). Not surprisingly, given the climate of the time, and focus on the 'Green Revolution', no mention was made of gender or women's participation in irrigated agriculture in these early policies.

To remedy the challenges posed by poor rainfall, Tanzania has ratified alternative methods, such as irrigation, to improve yields (Mbawala 1979). At the same time, the use of irrigation in Tanzania, has over the years been marginally leading to lower crop production as well as an increase in food insecurity (Agricultural Policy 2013: 1). In addition, more than a third of Tanzania receives less than 800mm of rainfall per year and less than a third of the rest of the country receives rainfall above 1000mm per year (Njuki et al. 2014: 308). Despite the availability of rainfall in Tanzania, it has become extremely unreliable and inadequate in sustaining farming, thus increasing the need for irrigation schemes.

Agriculture, being the top economic activity in Tanzania, employs more people than any other economic activity. However, due to the high costs associated with the development and usage of large-scale irrigation projects, only a small fraction of the proposed land is under irrigation (Njuki et al. 2014). Moreover, irrigation in Tanzania is used for small-scale farming in which food for domestic use is produced. Women in Tanzania have been observed as being more engaged in small-scale agricultural activities whose purpose is primarily food production for the necessary consumption of the family. Women are said to be deeply involved in agriculture and contribute about 70% to Tanzania's total food requirement (Agricultural Policy 2013: 4).

The small-scale farming practised by women plays an integral part in the economy, as it not only supplies food to the villagers, but also provides a source of income for them to educate and develop their families. However, it was observed that the number of women involved in the operations of large-scale irrigation projects across Tanzania is significantly low because of the high technological and mechanical capacity required for running the projects. A significant section among Tanzanian women have been formally educated, who are thus exempt from the need to participate in the operation of various irrigation schemes in the country, which is considered below their qualifications (Mdee et al. 2014: 5).

3.3 JICA, Women and Irrigated Agriculture

For the past 31 years the Japan International Cooperation Agency (JICA) has supported Tanzania through development schemes. During the Mwalimu Nyerere time cooperation between Tanzania and Japan was fostered and Tanzania wanted to benefit from the “100 years of Japan in paddy cultivation”. JICA extended its cooperation in the areas of irrigated agriculture, small-scale industrial development, rural electrification and water resource studies (Takeda 1998: 1). JICA established six irrigation model site projects in Tanzania to promote paddy cultivation techniques; the sites covered five zones, in the Northern, Southern, Eastern, Central and Western Zone. Achievements were seen through farmers training in agronomics, which linked to irrigated paddy cultivation, improved seeds and fertilizers, which in turn led to changes to the type of paddy produced in the scheme, paddy cropping pattern and increased use of tractor services. However, only recently has this history of cooperation featured the issues of women and gender.

JICA has recognized the importance of gender equality in irrigated agriculture since 2001, but it has not always done so. After 2001, JICA developed an explicit strategy for effective gender equality, in the implementation of irrigated agricultural projects they fund. To this end, JICA now supports different programs with the aim of responding to gender issues in each irrigation project, nation-wide in Tanzania. The mainstreaming of gender in LMIS has been done in different ways, one being through trainings provided by KATC, in which they ensure that an equal ratio of male and female farmers are considered, other ways is through the fair benefit of resources, properties, labour and income from farming, although fair allocation of resources still poses a question mark on how it is monitored in households.

Prior to 2001, the situation was quite different, for a long time, the Japanese government, through JICA, worked with the government of Tanzania and

negotiated terms and conditions to implement large-scale irrigation projects in the country. Out of 50 potential projects identified by the Japanese experts who visited the country in the 1970's, 16 projects were selected including LMIS (Ampiah 1996:113). The 16 implemented projects with 6 irrigation model sites made Tanzania one of the major recipients of Japanese development aid in Sub-Saharan Africa during the 1970s and 1980s.

Thus, since 1977 JICA's focus on Tanzania is based on the promotion of irrigation development and provision of technical support for the effective functioning of the Zone Irrigation Technical Service Units (ZITSUs). This has enhanced the capacity of district engineers in formulating, implementing, operating and managing projects, which in turn has improved rice production techniques. The development of Lower Moshi schemes covered different stages including the transformation of agricultural technology, infrastructure and irrigation management. The resulted in rice production increasing from 2 tons/ha to 6.5 tons/ha. Increased rice production overshadowed other cash crops, which were long time cash crops in Moshi, this impacted on the assurance of food and on individual's living standards (Kissawike 2008: 101).

3.4 Gender, Irrigation and Liberalisation

In Tanzania women play a substantial part in agriculture, and even more so in advancing irrigation as a strategy to maximize agricultural output. The government of Tanzania notes that women contribute up to 70% of the country's food requirements (Agricultural Policy 2013: 4). Furthermore, 54% of the workforce in agriculture is made up of women Leavens (2011) and about 90% of active working women are engaged in agriculture related activities either as farmers or sellers of their labour or agricultural produce at the market (Agriculture Policy 2013). In as much as Tanzanian women play integral roles in advancing agriculture by using irrigation, it is noted that many of them do so as subordinates to male counterparts in their families or communities, who run the farms (Lusuva 2012: 34).

At the same time, the government of Tanzania, through its ministries for agriculture as well as water and irrigation, has put in place measures to boost its food security through irrigation. Technocrats in Dar es Salaam view agriculture as a highly risky affair due to the unpredictability of rainfall as well as other calamities such as floods, poor harvest, and drought. The country has put in place the National Irrigation Policy to aid agriculture through effective management of its irrigation projects (Agricultural Policy 2013). Under this policy, the government ensures that available water is used efficiently with the intent to enhance crop productivity (Agricultural Policy 2013; Mbawala 1979).

The Ministry of Agriculture has continued to point out the need to improve traditional schemes to meet farmers' demands and national objectives of ensuring food security (Kissawike 2008). Thus, more effort was placed on the irrigation sector, as agriculture is the pillar of the country's economy and rural livelihoods (Kissawike 2008). Different donors and NGOs have supported the government to improve on traditional irrigation schemes, including JICA. Here the government had the direct role of ensuring the operation of the scheme and maintenance. However, types of crops cultivated were donor and government driven (Mascarenhas et al. 1985).

Full support of the government into schemes changed in the 1980's during the Structural Adjustment Policies (SAP), brought on by drought and the rise of oil prices. The economic growth rate of Tanzania dropped drastically, and the government turned to the IMF and World Bank for loans. The conditions attached to these loans led the Tanzanian government to review and redefine the role of the state and the private sector in agriculture (Ibhawoh and Dibua 2003). This led to changes in the following areas:

“The liberalisation of all agricultural markets and removal of state monopolies over exports and imports;

- “Withdrawal of the state from agricultural production;
- A focus on food security at national and household levels;
- Emphasis on the private sector as an engine of growth in crop production, processing and marketing;
- Decentralisation of public agricultural extension services and transfer of administrative responsibility to Local Government Authority (LGAs).
- Improving security of tenure and allocation of the land” (Oates et al. 2017: 23).

The resulting changes led the Tanzanian government to shift its responsibilities, thus handing over responsibility to village councils and the then Water Users Association (WUA) with limited resources from central government. Decentralization reportedly led to problems of mismanagement of resources in the local schemes (Kissawike 2008). Due to the failure of WUA and village councils in the management of local agricultural schemes, the central government ministries shifted many of their former responsibilities onto regional administrations and irrigation units under regional agriculture officers (Kissawike 2008). Irrigation development since 1980's to 2012 remained under the joint coordination of the National Irrigation Department, which is a part of the Ministry of Agriculture, Food Security and Cooperatives (MAFC) and the Ministry of Water and Irrigation (MWI). In 2013 this was changed, and the National Irrigation Commission came into existence, under the Ministry of Water and Irrigation. The Commission is responsible for coordinating, monitoring and regulating irrigation activities across Tanzania (Agricultural Policy 2013).

3.5 Conclusion

Irrigation farming was adopted in Tanzania after independence and continues to play a main role in large-scale production of food in the country. Rainfall in the country is unreliable; hence small-scale irrigation is practiced due to the high costs associated with large-scale irrigation farming. Although women are the major contributors of food production in the country, the question of whether they are able to master the use of automated processes to carry out agricultural activities remains. This means that for them to be involved in large-scale farming like men, they would need to be trained in the use of agricultural technologies. JICA plays a significant role in boosting agricultural production in the country and has partially succeeded in empowering women to take part in irrigation schemes particularly in Lower Moshi. As a result, paddy cultivation has increased

and continues to spread in Lower Moshi and in other parts of the country. In the next chapter, the data is analyzed, and the findings are interpreted.

Chapter 4 : An Overview: Gender Relations and Irrigated Agriculture in LMIS

4.1 Introduction

This chapter provides a discussion on the analysis and findings of the data collected in the field in July and August 2018 in the four villages of Mabogini, Rau River, Oria, and Chekereni, and starts with an overview of the LMIS scheme in the summer of 2018. The profiles of respondents are then presented, analysing some characteristics of the sample. Thereafter, the ‘gender division of labour’ in the Lower Moshi region among the Chagga, who make up most of the scheme participants, is discussed. The key findings of the study are analysed in terms of the categories presented in Chapter 2, namely: (1) women’s access to land, (2) women’s access to technology, (3) women’s participation in decision-making in the LMIS. There is a particular focus on women farmers and their issues, which include problems with land, marriage, custom, access to land and technology, the limits of women’s formal and informal participation in the scheme, and their attitudes towards being involved in decision-making. Other issues that emerged from fieldwork include problems with agricultural inputs, with credit availability, and negative perceptions among some men farmers towards women’s growing participation in all aspects of the scheme.

This study reveals that women farmers have the financial responsibility of taking care of more than five children, older parents, relatives, and orphans; hence, there exists high dependency levels. Additionally, most of the participants had low levels of education, as they had not attained secondary level education. Both men and women carried out irrigation activities in the Lower Moshi area in rented, inherited, or bought lands. In terms of training, results showed that there were inadequate personnel to provide agricultural trainings. Furthermore, respondents complained of not receiving pesticides, seeds, fertilizers and agricultural assets from the government. They also stated that tractors were expensive to hire, making it hard to follow cropping patterns. Farmers had no access to credit facilities as the cooperative that was formed failed to operate in later stages.

Figure 3: Women transplanting paddy



Source: Field Data 2018

Figure 4: Paddy waiting to be processed



Source: Field Data 2018

4.2 Profile of the respondents

4.2.3 Age of the respondents

In terms of age, as previously mentioned in the methodology chapter, that respondents for this study were mostly aged between 30 and 40. Some older men and women provided oral histories of the LMIS (ages: 84, woman, 72, male, 68, male). The notable absence of younger informants may in part be due to the emergence of the motorcycle (boda boda and bajaj) business, in which many younger men are involved. Motorbikes are heavily used as a means of transport in the irrigation scheme area, as there are no tarmac roads.

Table 2: Summary of the Interviewee

Women Farmers	Women Leaders	Male Farmers	Irrigators Association Leaders	Government officials	FGD
7	7	7	6	4	1 with 6 people

Total: 37

For young women, those under-30s it was observed that most were running small kiosks, selling phone credit and second-hand clothes, among other things. Large numbers of the under-30s depend on petty trading and motorcycles as their main business. It is interesting to note that for the younger generation, farming is not (yet) perceived as an economically attractive activity. The young women I spoke to under 30 specifically lack in in farming activities.

4.2.4 Marital Status

The majority of women respondents in this study indicated that they were married, a few were widows and single. This study found that most of the houses were headed by men, even though respondents signified that their husbands were not taking care of them or the family. Thus, the women had to work hard on irrigation farming to be able to take care of their families. Irrigation farming is the main source of income in Lower Moshi for the majority. (Women leaders-interview at Chekereni Village on 24-09-18 and the scheme Coordinator on the history of LMIS on 19-07-2018).

4.2.5 Respondents' Dependents

In the study area respondents had many dependents, which ranged from 4 to 6 children and included other relatives, orphans and older parents. This situation shows that most women farmers have more financial responsibilities according to the number of dependents. A high dependency ratio in the household is an indicator of poverty, since there are usually many dependents per person earning. In households with few dependents, even if they are earning less, there is less vulnerability.

4.2.6 Respondents' Education Level

Since independence, education has been a priority in Tanzania, however 57 years after independence the universal education goal has not yet been met. Respondents from the study fall under different categories in terms of education, from having completed only primary level to secondary and tertiary level. As will be discussed later in the chapter, most respondents did not reach secondary level education. The expectation is that the higher the level of education, the higher the opportunity for a woman to generate more income and have a better understanding of agricultural technology. Conversely, a lower level of education should contribute to women being able to meet the many challenges in improving and adopting new agricultural skills or technology and to be able to

look for appropriate agricultural information (Ahmed et al. 2012, Sinyolo et al. 2014).

4.3 Gendered Divisions of Labour in Lower Moshi

Among the Chaggas there also exists a traditional gendered division of crops among men and women. Traditionally women have been responsible for providing foodstuffs for the household, and this requires women to grow and harvest food crops. Men by contrast, are traditionally responsible for cash crops. This division of crops is based on the cultural notion that women are accountable for feeding themselves and their family, and that men as cash crops growers need to earn money to provide for the family in terms of school fees for children, the costs of building houses and buying plots of land or investing in other businesses. Additionally, in paddy cultivation activities such as seeds preparation, transplanting, bird scaring, weeding and harvesting are mostly done by women, however, activities like fertilizer and pesticide application, puddling and ploughing are men's activities, although they are now mechanized which result in an unbalance gender division of labour in the scheme.

Table 3: Gender division of labour and level of involvement in Agricultural activities

No	Activities	Male	Female
1	Land preparation	✓	✓
2	Seeds preparation		✓
3	Ploughing	✓	
4	Transplanting		✓
5	Irrigation Activities	✓	
6	Weeding		✓
7	Threshing		✓
8	Bird scaring		✓
9	Harvesting	✓	✓
10	Transporting	✓	
11	Storage	✓	
12	Drying		✓
12	Milling		✓

Source: Field Data 2018

4.4 Gendered Access to Land

In many rural settings land is one of the factors that regulates women's wellbeing. This is the case for women in the LMIS who depend on the land for their livelihood. In the LMIS men and women obtain access to land through various means like inheritance, renting, or through permission from the husband or by buying land. (Women Leaders interview at Chekereni Village, on 24-07-18 and Women farmers interview at Mabogini Village on 24-07-18 and Rau river on 26-07-2018).

However, women who were interviewed reacted that even though they farm in the LMIS, still their access to land is very indirect compared to men. Men have direct access to land through inheritance since a large portion of land in Lower Moshi was originally owned by the Chagga ethnic group. Here women have no access to family land, but only access land for family use through marriage or their husband. Some are fortunate to be able to buy or rent on their own. It was also noted that in the LMIS those with no access to land especially women who are the majority, either sell their labor to land owners, rent irrigation land from farmers with no capital or interest in farming. (Women leaders, interview on 24-07-18, FGD on 24-07-2018, Government official, interview conducted on 3-08-2018 and Irrigators Association leaders, interview conducted on 25-07-2018). One of the female farmer's narrated how she got land in the scheme:

"I got a piece of plot 50m from my father in-law. After my husband passed away, I remained with children to take care of and I started working in people's farms to be able to feed my children although what I got was not enough. I used to ask for support from my husband's relatives until my father in-law gave me a piece of land to farm and supplement my income" (Women Leader, Mabogini Village, interviewed on 25-07-2018).

This is an example of the wider situation of women in Lower Moshi and relates to what many studies have shown, to be the ways in which patriarchy exists. That is, women are expected to either secure land through their husband, thus through marriage, or to survive on very little (Shimba 2000, De Schutter 2013). Widows are particularly vulnerable to poverty, given that their husbands cannot provide access to land, as this example shows. Nevertheless, her experience shows that however much it is said that women are participating in irrigated farming in the LMIS the benefit which they receive is very little in relation to the size of plots owned by women.

This relates to the long-time study of early work on African women in agriculture by Boserup (1970). The study looked at the Sexual Division of Labor in Agriculture where women produced food crops for family consumption while men produce cash crops for business or money. Boserup (1970) provides evidence on the work performed by women in agriculture and the existing traditional division of labor. The LMIS is no exception, women do not benefit from paddy cultivation because they do not own plots, which could make them economically independent, and give them the choice of whether to cultivate food or cash crops, giving them high bargaining power.

With land being the main source of income in Lower Moshi, and as women do not have the equal access to land as men, this leads to women being disadvantaged in accessing other sources of income outside the family. Women respondents in this study pointed out that having land in the scheme is very crucial for their livelihood, family survival and income in general. A woman farmer responded that without irrigation there is no life in Lower Moshi:

"There is no life in this community without this scheme, only if you knew the situation of this place when there was no this project, the place was full of the baobab trees, mud houses and dry land but see now the way its green everywhere" (A Woman Farmer interviewed at Mabogini Village on 24-7-2018).

It was also mentioned that for women to own land in the scheme increases their bargaining power in a different aspect of life. In the LMIS land size is standardized for every farmer at 0.3ha. However, farmers with good capital have

more than one plot in the scheme, with additional plots acquired through renting or buying. Farmers with inadequate capital, of whom the majority are women, sometimes get together to share the cost of production and the workload in one plot of 0.3 ha. A woman with land may invite two or three friends to provide some of the capital, so that rice can be successfully planted at the right season. There were several examples of this mentioned by respondents, who found this a means to overcome their shortage of capital, to meet the high cost of transplanting. However, it also makes their returns significantly lower. So, whilst this solution helps women meet their costs, it also reduces their benefits.

“Though I farm in the scheme my produce is not the same as other farmers because I farm with my friend due to inadequate capital, hence come together to share cost of cultivation” (A Woman farmer, interviewed on 27-07-2018 at Chekereni Village).

Only four of the women respondents stated that they farmed in more than one plot, even though this is said to be quite common among men farmers. One of the more fortunate women inherited land after the death of their husbands, two were relocated from the water sources where they were forced to go to Lower Moshi in Oria Village where she was allocated land and one bought from her savings as she worked for a long time in the nearby sugar plantation. The management of plots is still challenging to them in terms of capital and agricultural inputs, however for them to manage farming they sell yield of one plot of 0.3 ha to be able to continue with farming in other plots.

While there are a few fortunate women in the LMIS who own land in the scheme, data from the field shows that the majority of men are landowners. The scheme has a total of 776 landowners where women are 160 and men 613 (Field data 2018). Women’s chances to own land under the country’s policy was upgraded in the Land Act of 1999, however the Act did not change the situation for women in the LMIS, as the land was already occupied by men under customary ownership. Therefore, the reallocation of land in the LMIS is no longer in existence; one can only secure land in the scheme by buying or renting.

4.5 Access to Agricultural Technology

Data collected from the field in response to the question of the availability of extension services reveals that all women farmers interviewed are aware of extension officers in their villages and are aware that they can consult them whenever there is a need. However, respondents admitted that extension officers are not enough to cover all four villages in the project. The available extension officers mentioned are one agricultural officer, one agronomist, one irrigation engineer and the scheme coordinator who takes on another role as agricultural officer and data collector. It is important for the government to add to the very limited number of extension officers in the scheme due to its importance in increasing farmers produce and acting as a catalyst for new technology in agriculture (Sinyolo et al. 2014).

Assurance of quality and enough quantity of agricultural inputs is key to improving productivity and farmers’ income (Ahmed et al. 2012, Croppenstedt et al. 2013). However, government as a key provider does not meet its responsibility. In the interviews women revealed that the last time they received

agricultural input, seeds, fertilizer and pesticides from the government was in 2014 and 2015. Furthermore, inputs were coming in late, reaching farmers after they had already planted and or applied fertilizer and pesticides. Even when inputs did arrive in time, these were not enough to distribute to every farmer in the scheme. During data collection, it was transplanting season and no farmer had received any agricultural inputs.

Respondents pointed out that a lack of agricultural inputs like seeds, fertilizer, pesticide, and tractor services has led them to not meet the standard yield which is 22-28 bags of paddy in a season. An extension officer and the respondents lamented the high cost of agricultural inputs, which some farmers cannot afford due to financial constraints and the fluctuations in inputs prices. One of the respondents reacted that:

“I am not happy with my last season yield because it was below the standard yield of this scheme, but all was due to lack of fertilizer and pesticide which I hoped it was going to come” (A woman farmer, Chekereni Village, 27-07-2018).

The Kilimanjaro Agricultural Training Center (KATC) is a center inside the scheme, which was established by JICA in 1985 during the development of the LMIS with the aim of disseminating good practices. The center had all the necessary agriculture inputs for farmers especially seeds production and assets such as tractors. Tractors were enough to cultivate land in the scheme with low prices. To date most of the tractors are not operating and some were sold. Therefore, farmers do not have tractor services with low prices rather they pay individuals who saw an opportunity to invest in them and now charge farmers higher prices. In addition, because there are inadequate numbers of tractors, and there are many farmers, it is difficult for the available tractors to cultivate and/or harvest the entire scheme area hence there is a failure to follow cropping patterns.

As indicated above, the LMIS was introduced to mechanize rice cultivation, as a key element to increase yield, but this did not last long due to breakdown and selling of tractors. Respondents elaborated that mismanagement of the KATC and the scheme led to the failure of tractors, while management argued that lack of funds to buy tractor spare parts was the major reason.

The introduction of mechanization in paddy cultivation was aimed at reducing labor-intensive activities, as traditionally high labor is requirement in paddy production, however, it has not managed to reduce labor-intensive activities rather the traditional way of rice cultivation continues. This is also due to the introduction of other crops in the scheme like maize and beans, which increase demand for labor in the scheme. In addition, labor-intensive paddy cultivation encouraged migration of laborers from different places to come to Lower Moshi in search of paid labor.

4.6 Women Leadership Positions in LMIS

Here women's contribution in the scheme's decision-making processes is analyzing by scrutinizing their actual participation in scheme meetings and the scheme association. According to the respondents there are existing rules for one to be a leader in the scheme or in the Irrigators Association. These are mentioned in the Guiding Constitution for Irrigators Association, and include being above 18 years, own land in the scheme, pay water bills, good record of attending meetings and other farming contributions. As indicated in the Irrigators Constitution elections are held every two or three years to select new leaders depending on the member's agreement.

During the interviews it was found that all respondents are aware of the rules and criteria for one to become a leader in the scheme or Irrigators Association, however there is low participation of women in the leadership positions. This might be because land ownership in the scheme is one of the criteria for leadership positions and as stated above land ownership is significantly lower for women in the LMIS. Regardless, one male farmer (2018) noted, "women here are not confident enough to lead in this scheme". This sentiment was contradicted by one of the women leaders, who when asked how she manages to lead such a big group, she responded saying;

"I am strong, I am not shy or scared of men like other women, I am confident enough and know my role and responsibilities" (Women Leader, Rau River Village Interviewed on 27-7-2018).

From the data collection it is observed that all respondents agreed that there was no discrimination in the election process that women and men have equal chance to participate but most of the women do not bother to take the opportunity. However, even though the constitution needs both women and men representation in leadership, there are no mechanisms that encourage women to participate in leadership positions. It was also observed that the position of Treasurer was most often held by a woman, alluding to the notion that women are more trustworthy in handling money.

Women respondents pointed out that scheme meetings are held at least twice in every cultivation season (in a year the LMIS cultivate three times following their crop pattern which starts from January to May/June, May to September/October, September to January/February). Giving marginalized or less privileged groups a chance to participate in making important decisions boosts empowerment in societies. Important decisions are made at meetings, which are convened in Lower Moshi, and this it is crucial for all irrigators from the four villages of the project to attend. These meetings take place in Chekereni village where the Irrigators Association offices are located.

In all the interviews conducted, women pointed out that they receive meeting information from their block leaders and all of them attend meetings. Yet, at the same time, they argue that they must attend to other responsibilities at home before attending the meeting, which is schedule from 09h00-11h00 every Saturday. Respondents felt encouraged that in the meetings everyone has an equal chance to air his/her views, some are very confident to express and give their opinion and men are listening and take everything into consideration. As the women respondents live in Lower Moshi which belongs to a patriarchal system where traditionally women have no voice, this situation shows that slowly

things are changing as seen from the response of one-woman farmer who said that these days “men’s attitudes towards women in meetings has changed” (A woman leader interview on 27-7-2018 at Rau River Village).

In the interviews I observed many women hold the treasurer position at the block level, however in the Irrigators Association the number of women who are in executive positions is minimal. There was only one woman in the executive board. When respondents were asked how women’s issues were represented in the meeting, the response was that if women have any concerns they can approach the upper management without fear. When asked if there were any special concerns that women had presented to management since they became active members of the Irrigators Association, only one person mentioned a single concern. This had been the request of women to have at least one paid irrigator per block with the aim that nobody will be able to irrigate his or her own plot, this task would be done by the paid irrigator. This was proposed as a creative means to avoid water conflicts from starting in the area. Since many men farmers seemed to feel that using water was “their right”, by proposing a paid irrigator per block the women were hoping to ensure that water was used according to schedule. It is interesting to note that if employed, the paid irrigator, who would mostly work at night, would not likely be a woman, due to security concerns that might arise.

4.7 Remaining Challenges for Women Farmers in LMIS

4.7.1 Women’s Responsibilities in the Home

It was revealed in the study that women spend too much time in performing domestic chores, one respondent pointed out that women who are not participating in farming have a big burden of domestic responsibilities on their back. After the time taken to accomplish domestic chores such as cleaning, cooking, washing, and collecting firewood, either there is no time for them to go to the farm or they are too tired to go to the farm. Some women find it very difficult to manage house activities and farming, this reason was mentioned by all the respondents in every group during the interviews. Nevertheless, all the domestic activities performed by women are key for family survival.

Time constraints for women to actively participate in agriculture cut across both women with land and without land, however women with no land are more disadvantaged because their survival depends on them being able to sell their labor. Yet it was revealed that women landowners feel that they have more burdens at home and in the community, which make most of them not want to accept taking leadership positions in the scheme. Respondents noted that the triple roles played by women limit their chances to excel in leadership. Some respondents pointed out that sometimes women are eager to take leadership in the scheme, but they are disqualified due to poor attendance in scheme meetings, which is key criteria for one to be voted in. This situation was also narrated by a woman farmer (2018);

“I wanted to contest for a position in irrigators association, but I was disqualified due to my poor attendance in meeting, I gave a genuine reason that

my husband was sick, and I had no one to leave him with at the same time I had to take care of my young children". (A woman farmer interviewed on 25-7-2018).

4.7.2 Women's Lack of Access to Credit and Capital

Data collection shows that the LMIS is capital intensive and commodified, hence women farmers who are fortunate to have land sometimes do not reap the benefits due to the high cost of cultivation and other bills related to water use. However, this problem can be easily mitigated should women farmers in the LMIS had access to credit facilities. Respondents reacted that in the 1990s the Rice Farmers Association (CHAWAMPU) started a savings and credit cooperative, with the aim of facilitating farmers credit facilities. The cooperative was managed by CHAWAMPU and remained to be the main financial institution for farmer.

Farmers in Lower Moshi contributed to the cooperative through a membership fee and could buy shares at the end of every cultivating season. However, according to the respondents the cooperative started to encounter challenges, which included a large number of defaulters, misuse of funds by management and theft. This led to members withdrawing their membership from the cooperative. Thus, the cooperative failed to operate and lost trust from its members. Farmers started to find other ways to access credit individually for paddy cultivation with little to no success due to a lack of collateral. As a result, women reported that they were forced to start small income generating activities to generate money, which would support them during cultivation.

Loss of trust among farmers towards its cooperative CHAWAMPU was also pointed out by Cooperative Officer (interviewed on 3-8-2018) who stated, "CHAWAMPU is struggling to wake up, however its members do not trust it anymore". The lack of capital among women farmers to buy or rent land and cover the cost of irrigation remains a challenge among many women respondents. Consequently, women with land access cannot benefit because of the high cost of production, thus resort to renting the land to those with capacity. In Lower Moshi the cost of renting land for paddy cultivation in one season is (300,000TZS=120€), this amount was said by women to be too expensive since most of them do not have a stable income. Moreover, the women lack the criteria to access credit, which can aid in them gaining benefits from their land ownership.

4.7.3 The need for Gendered Training Schemes

Women farmers pointed out that there are training programmes for farmers which takes place in and out of the scheme, only two respondents out of seven never attended farmers training. The trainings which were based on new seeds, how to prepare paddy seeds locally, value chain, the system of rice intensification (SRI), exchange programmes to nearby regions which cultivate paddy, crop management, crop rotation, water efficiency, field trip and paddy transplanting. These respondents admitted that the trainings were very important and equipped them with useful knowledge on different topics. Moreover, the KATC also provide gender training to farmers in the scheme, their training covers topics such as nutrition, HIV/AIDS, family budget and diseases related to irrigation. Women farmers showed that there are training programmes for farmers which

“I was not comfortable to be with men in the classroom. I frequently went to toilet to hide out from the sessions because we were socialized to be humble in front of men. But after one week, I found myself happy and enjoying the training” (Female participant in gender training 2014).

Figure 5 : Farmers in the training



Source: Voice from the Community Report (2014: 4)

Women farmers appreciate what has been done by the extension officers and argue that apart from the theory part of the information which is usually provided, practical in the field training is very crucial, this is important because of level of education among many farmers is too low, therefore learning through practice is vital.

Figure 6 : Weeding demonstration



Source: Voice from the Community Report (2014: 4)

Participants in this study explained that following agricultural skills and good paddy practices, which were provided in trainings, increased yield. Popular crops in the LMIS are paddy, maize and beans; paddy recorded the highest yield in the 2017 season of 7.2 t/ha followed by maize grown upland recorded at 3.0t/ha and 4.3 t/ha for maize grown in plots, while beans recorded 1.5 t/ha. (Scheme coordinators interview on 19-07-18).

4.8 Conclusion

The research findings show that most paddy farmers are in their productive age although youths aged below 30 do not take part in farming. This is either due to many of them venturing into the motorcycle business or having moved from rural to urban areas. The fact that women have a high financial burden because of having to take care of many family members and relatives shows that the dependency ratio is high, which is a poverty indicator. Low education levels, on the other hand, translates to women lacking the ability to employ technology in irrigation schemes as it becomes challenging for them to adopt new technology and access proper agricultural information. Conclusively, women encounter challenges in their participation in irrigation activities, which include inaccessibility of agricultural inputs, insufficient capital, home burdens, land access, and unavailability of the market. The following chapter seeks to interpret these findings in relation to participation and empowerment.

Chapter 5 : Analysis and Discussion of Findings

5.1 Introduction

In this chapter, I draw out the key issues in the participation of women and how this can be challenged by structural constraints imposed by traditions and norms in a community (Gammage et al. 2016: 2). This chapter explains further why policies meant to increase the participation of women and reduce the gender gap have not been very successful in the past, especially concerning land allocation among women at LMIS. One problem is the enforcement challenges as well as unclear strategies that are in place. Nonetheless, women's participation when it has succeeded has resulted in some level of empowerment and in expansion of their freedoms. This in turn has facilitated women's improved access to and control over resources in the households and in the community in general.

5.2 Gendered Access to Resources

As observed by Bayeh (2016: 38) women in rural areas did not participate much in community development and economic activities as they face infrastructure constraints and spend more time doing household chores. Women are also relatively more constrained than men by cultural norms and beliefs in the communities which limit their access to resources and social networks. The study revealed that land in the LMIS is gendered because men had a better access to land than women. This situation was replicated in the rest of Tanzania and in many countries where a patrilineal system of land inheritance was used to pass land ownership from one generation to the next. In fact, women were particularly at the mercy of their male counterparts when it comes to accessing family land, with the rights of women being limited to using the land to feed their families but not to prosper economically.

In terms of finances, women in LMIS area were found to be taking loans mainly from informal credit institutions and they did participate in this way in small-scale income-generating activities, which are the main source of women's own incomes. Women with higher education levels are more likely to be in an improved position to generate cash incomes for the household, because of paid work and good social networks, which makes it easier for them to borrow from the formal sector. The fact that land in LMIS is gendered given men more control over this key resource than women. If women in the area could own land, then they too would have an asset that they could use to build on to improve their welfare.

5.3 Participation, Networks and Empowerment issues

This study on Gender Issues in Irrigated Agriculture revealed that the conceptualization of women participation is diverse in the in LMIS. Indeed, labour is one avenue in which women participate particularly in agricultural economies. Involvement in agriculture related activities is common in third world countries in which agriculture plays a crucial in the economy of the country (Nain and Kumar 2010a: 67). The study shows that participation of women was in the low levels in their communities as evidenced by their low numbers in positions of leadership. At LMIS, women in high levels of responsibility were only found as treasurers of the Irrigators Association at the block level. This contributed to their visibility in their contributions in agriculture considering that many of their activities were overlooked or given low attention, (Fletcher 2016: 12). Low women participation in decision making positions remains a challenge in the LMIS. This mirrors other studies in countries like Thailand where the number of women farmers in key leadership positions is very minimal. However, the situation in Tanzania is a marked improvement when compared to countries like Indonesia, where norms and rules do not allow women to mix with men, hence a study done in Yogyakarta, Indonesia shows that men are the key decision makers in the absence of women farmers (Akter et al. 2017: 275).

With regards to marginalization, participation that is undertaken in groups is often more visible. In this regard, Tolbert et al. (2016) observes that undertaking activities in groups is more empowering than when done individually because it enables collaboration between the participants. However, in the LMIS collaboration, avenues such as cooperatives and the Irrigators Association which aim to help empower women farmers, have been shrouded by corruption and mismanagement, and therefore denies women in the scheme an equitable environment in which to participate in opportunities that could lead to their empowerment.

Networks is another avenue, that could facilitate participation, as belonging to a network ensures that one develops relationships with other people, which influences the level of involvement in community projects. It is observed by Birner et al. (2009) that agricultural services are important for transferring skills and technology to farmers and are therefore important for supporting and facilitating their engagement in agricultural production and contributing to an improvement in livelihoods and wellbeing of women farmers. As such, the formation of partnerships and linkages with the providers of advisory services is important for the participation of marginalized members of a community especially women. Relatedly, women networking in the LMIS can be categorized among women with land and women without land. Women without land come together to form a group to rent land from landowners, while few women with land but no capital invite friends, relatives or neighbours to cultivate together and share the produce.

However, the participation of women in off-farm economic activities or market-based activities constrains their participation in the development of their communities (Koolwal and Van de Walle 2013: 369). In fact, Koolwal and Van de Walle (2013) observe that the ability of rural women to participate in economic activities is constrained by poor infrastructure that undervalues the time of women and relegates them to spending much more time on household

chores instead. Therefore, agency and structure are closely related, with structures in the community facilitating or constraining the agency of individuals. In this regard, participation of women may be challenged by structural constraints imposed by traditions and norms in a community that enforce rules which women are unable to overcome (Gammage et al. 2016). This may explain why the policies that are meant to increase participation of women and reduce the gender gap have not succeeded much, especially with regards to land allocation among women in the LMIS. Nevertheless, women's participation often results in empowerment and expansion of freedoms, however small, which in turn facilitates access and control of resources found in the households and community in general. This was noted during data collection when participants were asked what does land mean to them, different response came out some said it is a sense of prestige, pride, confidence, criteria for one to be in a decision-making process in the community and in the households. Importantly, the women farmers who were interviewed did not mention the use of land for collateral, this means that they either took loans at local credit/financial institutions or gained income through small income generating activities, showing the resourcefulness of women in gaining income for cultivation.

Empowerment is facilitated by acquisition of education, with women who have high or medium levels of education being in a better position to generate income for the household compared to those with lower education (Gammage et al. 2016: 27). This implies that the limited empowerment observed with the women in the LMIS can be attributed to their low levels of education.

The study also reveals that land in the LMIS is gendered due to men having generational access to land and women not. This situation is representative of the rest of Tanzania and in many other countries where a patrilineal system of land inheritance is used to pass land ownership from one generation to the next. In fact, women were particularly at the mercy of their male counterparts when it comes to accessing family land, with the rights of women being limited to using the land to feed their families but not to prosper economically. In this regard, the fact that most women farmers in the LMIS are unable to make decisions related to the land at the scheme is a demonstration of the disempowerment they experience in their communities. Unfortunately, it is evident that women farmers are disempowered because they are denied the opportunities and environment to make choices by the men who possess power in the community and society. In this regard, Kabeer (1999b: 437) indicates that the exercising of choice by an individual depends on resources, agency and achievement and that these necessary conditions are interrelated.

Therefore, land is a relevant resource because it is a factor of production that influences the economic wellbeing of a person or a community. In this case, by being able to own land, it means that women have access to a valuable resource that can be used to facilitate the achievement of economic prosperity and the exercising of choice. Notably, only 160 of the 776-landowner are women, which indicates that women in the LMIS are underrepresented in land ownership. Since land ownership is one of the criteria for being elected into leadership positions in the LMIS, very few women can rise to positions of power in the Irrigators Association at the scheme. Following Kabeer's (1999b) argument, the men in the community, who are the elites in society including chiefs and heads of households, possess authoritative power to control land as a

resource and therefore are able to keep women away from such power. Interestingly, even those women that have access to land through purchasing or renting often avoided leadership positions. Kabeer (1999b: 440) attributes this to the internalization and acceptance of the secondary role played by women in their communities and the lower value social status. In this case, women advance the trends in society by finding no injustice in the inequality that was prevalent and their discrimination by the men in society as being normal and a burden to bear dutifully.

Women with land in the LMIS are seen to have bargaining power in their communities as compared to those who do not. In this case, women gain land through renting or buying either as individuals or groups in addition to being gifted by their relatives, especially if they are single and struggling with the rearing of children. Agarwal (1997b: 7) argues that women that own land have bargaining power that the landless women do not, in addition to the bargaining power required to gain access to land in the first place. Bargaining power could be accumulated over time as one negotiates the power structures within and outside the family and community. This may explain the ability of women farmers in the LMIS to access leadership positions, which enhanced their bargaining power among their communities.

For instance, men perceive land as an object of manliness and prestige, which increases the pressure on land ownership, particularly in areas with loose legal structures (Toulmin 2009). In addition, the lack of proper land registration or being under communities and therefore with no identifiable owner, complicates its availability as a resource. In this regard, with the customary approach to land management being under pressure particularly from land-grabbers, its availability as an economic resource to the households that live in such land becomes even more challenging (Toulmin 2009: 29). In fact, Toulmin (2009: 54) notes that women farmers are disadvantaged because they are at risk of being dispossessed due to their lack of inheritance rights and power. This curtails their ability to access financing, which requires collateral, often in the form of a land title or some other tangible asset. Likewise, Agarwal (1997b) observes that women are often short-changed in their bargaining power in so far as family resources and property are concerned even through the unitary family systems appeared to consolidate the preferences of the entire family.

This leads women to depend on their family for survival, which limits their bargaining power and perpetuates gender inequality that is rampant in patriarchal communities. Indeed, in many societies, women are deprived of their explicit bargaining voice and therefore resort to contestation approaches that are implicit such as withholding conjugal right from their spouses, withdrawal farming in the family land, silence, pretending sickness repeatedly, threatening to return to their parental homes and even persistent complaining (Agarwal 1997b). This can be seen in the experience of one of the women farmers (2018):

“I used to farm in the family land of my husband, I spent most of my time, however when it comes to distribution of what we produced my husband took control irrespective of my involvement in cultivation. It was too painful for me, I said to myself if I had my own land the decision on the use of money would have been on my hands. Later I started saving from my small business of cattle rearing and selling milk, I got money for renting a plot with my friend and we

started cultivating, so I have my own plot and my husband has his own plots" (FGD Participant, 24-07-2018).

The study shows that while women are involved in the manual aspects of labour in the LMIS, the men are involved in the more mechanized labour aspects, even though mechanization is a problematic labour aspect that comes with numerous drawbacks. Indeed, the roles of men and women in rural societies are gendered with women bearing the largest burden of manual labour in farming. In this regard, Nain and Kumar (2010b) argue that the agricultural sector in third world countries such as Tanzania, is heavily dependent on manual labour provided by women and men although women provide an average of 15 hours compared to the 7 or 8 hours that men provided. In the same manner, Peterman et al. (2011) states that the division of labour along gender lines in farming as well as in the industrial production of crops is prevalent in monogamous family structures. Men tend to be more economically empowered than women and therefore have better access to technical, human and natural resources.

5.4 Conclusion

In many parts of the world, labour is divided depending on the physicality of the tasks, with women being assigned tasks such as weeding, seeds preparation, bird scaring and transplanting the fields and processing the produce after harvesting, while the men are assigned to the more physically demanding tasks such as clearing the land for cultivating, application of fertilizer and pesticide. The same division of labour in paddy cultivation among women and men is noticed in southeast Asia which also shows that women have double work at home and in the field (Akter et al. 2017). In addition, women have lower educational achievements compared to men, which hindered their ability to access and adopt farming technologies such as inorganic fertilizers, modern farming equipment's and even decision-making status (Peterman et al.2011).

Women who did not participate in income-generating activities had very little say in the way household resources were used, with power to make such decisions being vested mainly in men, both husbands and sons. The situation resembles that in other countries, where some studied (see Ashraf (2009: 1268) that found a division of labour in financial terms between women, who assumed the role of budgeting for household utilities, whilst men mainly took charge of investing for the family. However, even then, men in Lower Moshi tend to supervise and monitor the way women spend even the money women earn themselves, in a bid to exercise control over their spouses. Men's disproportionate participation in income-generating labour gave them the ability to exercise their power by deciding on the expenditure of such proceeds in the household.

Chapter 6: Conclusions and Recommendations

6.1 Summary of Key Findings and Conclusions

From this study, men have adopted automated aspects of labour with women using manual methods to carry out farming activities. Men are also empowered economically compared to women as they have access to natural, human, and technological resources. Men are also ahead of women in terms of educational achievements which hinders their ability to use farming technologies. To meet the challenges faced by women in the LMIS, the Tanzanian government should implement gender sensitive policies to address and ensure that gender inequality is addressed. Another recommendation is for women in leadership positions to act as change agents and motivate other women farmers to take part in the activities of the irrigation scheme. Lastly, women should be trained on new technologies and skills to help them adopt good farming practices, which would allow them to take part in other activities that can help them generate income.

This study shows that, empowerment opportunities, although few, are available. From the data, it can be presumed that the challenges that women encounter in their participation in irrigation activities are the lack of capital whereby they cannot afford to rent or buy land to carry out irrigation activities. Those able to access it do not benefit due to high production costs. Another challenge is the lack of agricultural inputs like tractors, pesticides, seeds, and fertilizers, which results to low yields. Women take on more responsibilities at home and find it challenging to balance farming and housing activities. Women have little or no access to land as the customary law in the Lower Moshi region still favours men. Lastly, there is also the unavailability of markets to sell their produce especially rice; thus, forcing them to look for black markets, whose profits are little and are not enough to recover cultivation costs.

To address the above issues, women leaders should empower farmers to take part in scheme affairs and ensure that women take bigger roles in making important decisions in the scheme. In addition, gender policies should be reinforced to ensure that women are given equal treatment and have equal opportunities to access land just like their male counterparts. Training initiatives should be considered to help women generate income through other means other than farming. Women should also be trained on new skills and technologies to help them adopt good farming practices.

6.2 Recommendations

The following recommendations are made to help remedy the challenges of women in the LMIS;

There should be an implementation of gender-sensitive policies. Even more so because Tanzania is a signatory of different International and Regional treaties for gender equality, yet women farmers are still marginalized in many aspects. The policies and laws are either neglected, receive minimal treatment during their implementation or no good strategies are in place on how to tackle gender disparity in agriculture, thus contributing to the perpetuation of the

discriminatory environment surrounding women. This also requires the development of networks by women at LMIS that help devise effective implementation approaches that would persuade the participation of their male counterparts and the relevant institutions that can influence the implementation process that are headed by men.

Women who are already in positions of leadership and influence at LMIS should be involved as change agents to encourage the other women farmers who have been left out in decision making to participate in the affairs at the scheme. As such, these women should be part of advisory committees and awareness teams that seek to educate and empower other women at the scheme. In the same manner, women should be encouraged to take other leadership positions apart from those of treasurer, which appears to have been preserved for women. As such, women can assume larger responsibilities in guiding issues related to farming that affect their livelihoods and economic wellbeing. This would not only increase the voice of women at the decision-making level but also facilitate the consideration of women issues at this level as well.

Training initiatives aimed at uplifting the knowledge and skill level of the women farmers at the scheme should be implemented. Such training should not only focus on good farming practices but also on the engagement in other income generating activities outside farming and the management of the revenues accrued from these activities. Such training should encourage the formation of farmers, which would help mobilize resources for the pursuance of land ownership alongside the implementation of other developmental projects that have a direct economic empowering effect on women.

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Appendices

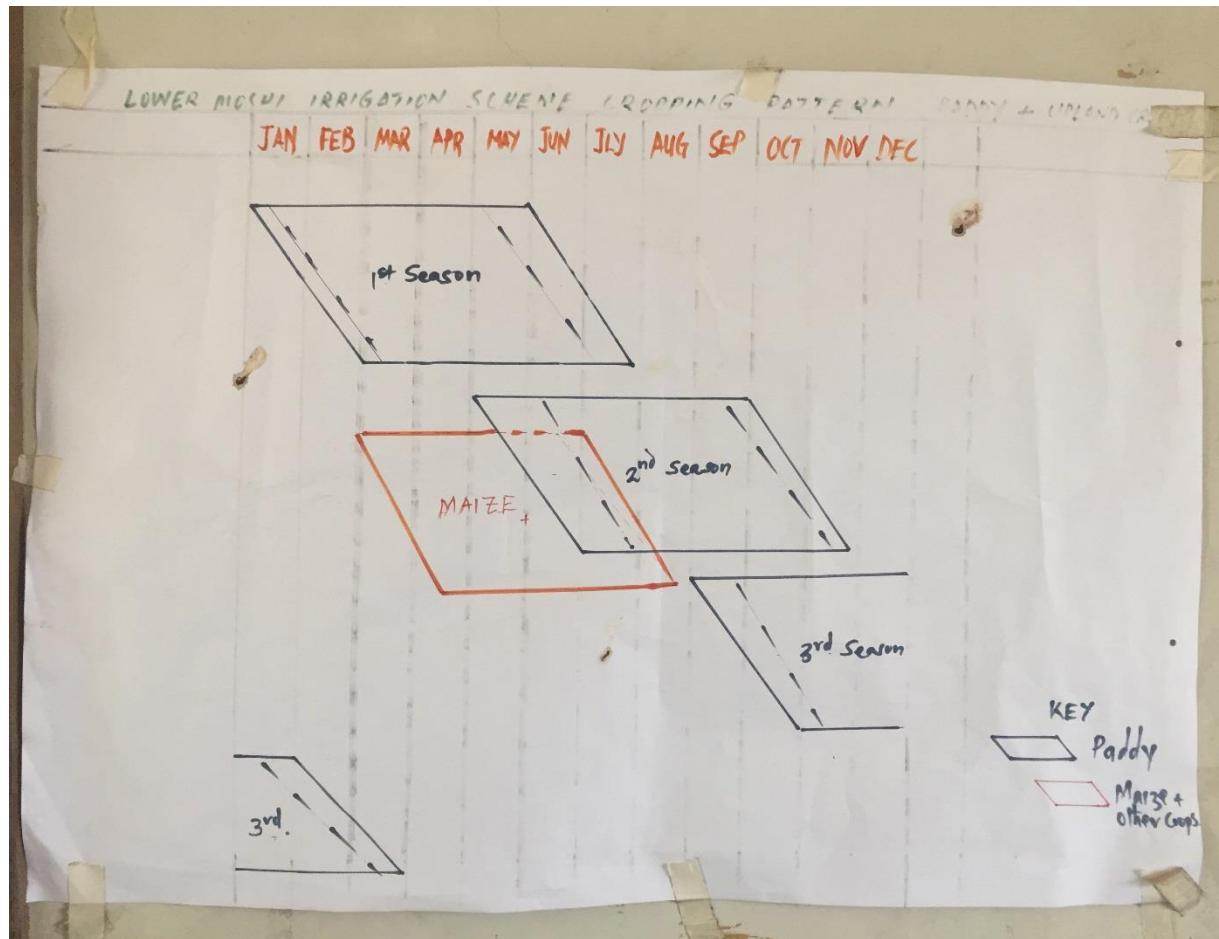
Appendix 1: Population of villages in Lower Moshi

No.	Village	No. of Households	Male	Female	Total
1	Mabogini	3750	6370	6772	7,141
2	Chekereni	442	1096	1540	2636
3	Oria	298	4660	4648	9308
4	Rau river	534	1100	1161	2261

Data obtained from village executive office in each village

Source: Field data 2018

Appendix 2: Cropping pattern of paddy at Lower Moshi scheme



Source: KATC

Appendix 3: Lower Moshi map showing paddy cultivation areas (in Green) and maize cultivation areas (in light yellow)



Source: KATC 1988

Appendix 4: Interview Guide for women farmers

My name is Cynthia Andrew Mushi, I am a master's student at the International Institute of Social Studies of the Erasmus University-Rotterdam in The Netherlands, undertaking a research as a partial fulfilment of MA programme in Human Rights, Gender and Conflict Studies: Social Justice Perspectives (SJP). I am conducting a research on women's participation in irrigated agriculture. My study focuses on three aspects which are very inter-related, access and control of land, access to agricultural technology and women's position in decision-making. In this matter all information collected in this questionnaire is anonymous and confidential. The information that you provide will be used just for academic research purposes and the results will contribute in the discussion which tend to improve women's participation in irrigation.

Your involvement and input will be highly appreciated.

1. SECTION A: PERSONAL DATA

- Age of respondents (a) 18-35years (b) 36-60 years (c) 60 and above
- Gender: Male Female.....
- Marital Status: Single... Married Divorced... Others
- Level of Education: No formal education (1). Primary level (2). Secondary level (3). Advanced level (4). Tertiary level (5)
.....
- Religion.....
- Ethnicity.....
- Family size(dependents)

2. Which village are you coming from.....

SECTION B: LAND ACCESS

3. Do you farm in the scheme?

Yes.....

No..... why.....

4. For how long have you been farming under this scheme?

5. Do you own land in this scheme? Yes..... No.....

6. If you are the owner, please indicate how you acquired the land.

1. Allocated own land

2. By inheritance

3. Through marriage

4. By Rent

5. Other Specify

7. What were the criterial for land allocation

8. What land size do you cultivate under the irrigation scheme?

(HA).....

9. What type of crops you grow and average production per season on each crop

10. Does your husband help you with your farming?

11. Does the allocation of irrigation land considers women? yes/no, How?

SECTION C: ACCESS TO SERVICES

12. Are you aware of any extension officers in your area?.....Male.....Female
13. Do you have organized training programmes for farmers?
14. If yes, have you ever attended any farmer's training programme?
If no, do you want to receive agricultural training to improve your farming skills?
15. Have you ever received the following agricultural inputs from the government?
 - (1) Seeds
 - (2) Fertilizer
 - (3) Farm tools
 - (4) Pesticides
16. Do you engage in other activities?
17. Do you have storage facilities?
18. Where do you sell your produce?
19. What is your total monthly income?

SECTION C. PARTICIPATION LEVELS IN IRRIGATION MATTERS

20. Are you a member of Irrigation farmers association?
Yes.....No.....
21. How frequently do you attend the meetings?
22. How many times a week /month do you have scheme meeting?
23. What time of the day do you have management meetings
24. What type of your participation is in the scheme?
 - a) A member of the association
 - b) Attending meetings and listening to decisions
 - c) Give out my views and able to contribute to decision making
25. What are the roles and responsibilities of farmers association?
26. Do you have any challenges when you want to attend meetings?
27. Do you have to seek permission from your husband to attend meetings?
28. What are the criteria for one to be a member of the scheme management?
29. Do women have equal chance to take part in election?
30. What are the views of this society about women?
31. Do women's contribution taken into consideration?
32. Do you think women in this community have benefited from this scheme?
33. Has your participation in the irrigation project changed your life?
Yes, how?.....
No, why?.....
34. What are the factors which prevent your participation in agricultural activities.

35. What are your recommendations for more effective participation of women in agricultural production?

The End

Appendix 5: Guiding Questions for Focus Group Discussion- Women

1. Name of the Villages
2. District.....
3. What is the history of the irrigation in Lower Moshi? When did it start?
4. How did you obtain the plots?
5. What types of crops do you cultivate?
6. How do you get the inputs for cultivation?
7. What kind of labour is used in agricultural activities?
8. How is the irrigation committee members recruited and for how long?
9. Do you hold any leadership position in village development committees or irrigation committees?
10. How is gender is considered in irrigation management. Are there women in the decision- making organ?
11. What is the proposition of men and women participating in water management decision making committees?
12. What are your opinion regarding women participation in Lower Moshi irrigation scheme, and what are the opportunities for improving women participation so that they also benefit?

Appendix 6: Interview Guide for Irrigators Association Leaders

My name is Cynthia Andrew Mushi, I am a master's student at the International Institute of Social Studies of the Erasmus University-Rotterdam in The Netherlands, undertaking a research as a partial fulfilment of MA programme in Human Rights, Gender and Conflict Studies: Social Justice Perspectives (SJP). I am conducting a research on women's participation in irrigated agriculture. My study focuses on three aspects which are very inter-related, access and control of land, access to agricultural technology and women's position in decision-making. In this matter all information collected in this questionnaire is anonymous and confidential. The information that you provide will be used just for academic research purposes and the results will contribute in the discussion which tend to improve women's participation in irrigation. It will take about 30 to 45 minutes to fill in this questionnaire.

Your involvement and input will be highly appreciated.

1. When did Lower Moshi Irrigation Association established?
2. Who are the members?
3. What are the criteria for one to be a member?
4. How often do you organize members meetings?
5. What are the roles of Lower Moshi Irrigation Association (LOMIA)?
6. Do women attend meetings?
7. What are the key issues of women which affects their participation.
8. Are women issues taken into consideration?
9. Are women fully involved in initiating, planning and implementation of the irrigation scheme? Please mention how they participate.
10. Do women allowed to hold different leadership positions in irrigation committees

yes.....no.....

11. Please mention position which are held by women in this Association.....
12. How do farmers acquire land in this scheme?
13. Do women have the right to own land in the scheme?
14. How do farmers access credit facilities in this scheme?
15. How do farmers access information about the association?
16. What relationship exists between you and the government?
17. In what way is the government helping farmers?
18. Do you think the farmers can keep the irrigation scheme running after the withdrawal of the JICA/Government support?

Appendix 7: Interview guide for Government Officials

1. How long have you been working with Lower Moshi Irrigation Scheme?
2. What is your position at Lower Moshi Irrigation Scheme?
3. What is the gender distribution of extension officers at Lower Moshi Irrigation Scheme?
4. What agricultural services do you offer to farmers?
5. How often do you organize training for farmers?
6. How do you ensure that farmers, especially women, have access to information regarding extension programmes?
7. Do female farmers fully participate in training programmes?
8. Do female farmers express their concerns? If yes, are their concerns considered in planning processes?
9. In which way is government assisting framers in Lower Moshi irrigation scheme?
10. What are the main obstacles for women participation in Lower Moshi irrigation scheme?
11. Do you think that the farmers can keep the irrigation scheme running after the withdrawal of the government or JICA as main funder?

Thank you for participation.

Appendix 8: Interview Guide for Kilimanjaro Agricultural Training Centre (KATC)

- 1.What is the evolution of the irrigation in Lower Moshi?
2. Why and when Kilimanjaro Agricultural Training Center was established?
3. What is KATC role in Lower Moshi irrigation Scheme?
4. Were there people living in the area before development of the scheme?
Yes..... No....
If yes where did, they come from?
5. Which improvements were made in Lower Moshi Irrigation Scheme?
6. What were the reasons for the improvements of the local/tradition irrigation
7. Which crops were cultivated before and after the modernization?
8. Who is responsible for the scheme management?
9. How is women participation in irrigation management?
10. How do farmers access agricultural services?
11. Where does Kilimanjaro Agricultural Training Centre and Zone Irrigation Unit share responsibilities to nurture Lower Moshi Scheme?
12. In which way is government assisting framers in Lower Moshi irrigation scheme?
13. What are the main obstacles for women participation in Lower Moshi irrigation scheme?
14. Do you think that the farmers can keep the irrigation scheme running after the withdrawal of the government or JICA as main funder?

The End

Thank you for your inputs

Appendix 9: Interview Guide for Women Leaders

- 1.** What is your position in Lower Moshi irrigation scheme?
- 2.** How did you reach that position?
- 3.** What is your role in the Lower Moshi Irrigation scheme?
How?
- 4.** How often do you conduct meetings?
- 5.** Who makes decisions regarding the time and duration of meetings
- 6.** What time of the day do you usually have meetings?
- 7.** Is there decision that you have influenced in favor of women since elected in this position in the scheme?
- 8.** How land is acquired in Lower Moshi Irrigation scheme?
- 9.** Does the allocation of irrigation land favors women? If yes/no, How?
- 10.** Do women in this community benefited from this scheme?
- 11.** What are women's challenges towards active participation in the scheme?
- 12.** Are there any issues you would like to discuss with me in respect of the operations?
of the Lower Moshi Irrigation Scheme?

The End

Thank you for your inputs

Appendix 10: Interview Guide for Men

1. Are men and women given equal opportunity to take part in the scheme activities?
2. In this community what do you understand by participation?
3. Which role is played by women in this community?
4. What roles are played by both men and women in this scheme?
5. What are your views about women in this scheme?
6. Are women allowed to speak at meetings?
7. Do men pay attention when women are speaking?
8. Do you take their contribution into consideration?
9. Do women have equal chance in the leadership of the scheme?
10. What are the main obstacles for women participation in Lower Moshi irrigation scheme?

The End

Thank you for your inputs