GENDER RELATIONS IN RICE QUALITY DECLARED SEED (QDS) IN TANZANIA: A CASE OF KILOMBERO DISTRICT, MOROGORO, TANZANIA

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EXTENDED ABSTRACT

Gender relations are essential in determining interactions between men and women in rice Quality Declared Seed (QDS) production. The importance of QDS for increased agricultural productivity cannot be over emphasized. The study's overall objective was to assess gender relation and rice QDS in Kilombero District, Morogoro, Tanzania. Overall objective was to determine linkages between gender relations and rice QDS in Kilombero District. Specifically, the study assessed gendered access and control over rice QDS resources among rice producers, examine attitude of men and women towards rice QDS, evaluate gender roles of men and women in rice QDS, and analyse factors influencing decision-making power in rice QDS in Kilombero, Morogoro, Tanzania. The study site was Kilombero because it is one of the districts on which Tanzania mainly depends for supply of rice. A cross sectional research design was used during data collection. Quantitative data were collected through administering a questionnaire to 218 respondents engaged in rice production. Similarly, qualitative data were collected through focus group discussions and key informant interviews to complement and allow triangulation of the data. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) while qualitative data were analysed using content analysis. In assessing gendered access and control over rice QDS resources among rice producers, it was found that access to rice QDS resources was very low among farmers in the area, even though women (45%) were found to have more access to some resources such as credit than men (13%) did. On the other hand, men were found to have more access to inputs (22%) and training on agriculture (29%) than women. Women in the study area had access to land too but lacked control over it. Cultural barriers strongly affected and influenced control of resources including land to women. It is concluded that women get fewer benefits in rice QDS due to poor access to and control of productive resources. There is a need to remove all

cultural barriers by creating awareness for both men and women using gender sensitive programmes in collaboration with relevant government policy.

In evaluating attitude of farmers towards rice QDS, it was found that the majority of farmers had positive perception on the effectiveness of rice QDS. Therefore, it is concluded that there is a viable opportunity to enhance farmers' produce by using rice QDS in the study area through appropriate information dissemination and provision of support and training needed by the farmers to maximize their produce and use of rice QDS. To achieve increased production in rice QDS, the government and other non-governmental actors should create mechanisms to improve access to rice QDS. The mentioned actors should, among other things, offer credit to the producer to increase rice QDS.

In assessing gender role of men and women towards rice QDS, it was found that women engaged in many roles in rice QDS production rather men. Men were predominantly engaged in land preparation, fertilizer application, pest management, packing, labelling, grading and storage while other farming activities were carried out by women. Therefore, it can be concluded that unequal gender roles exist between men and women in the study area. It is recommended that gender sensitivity and awareness programme should be insisted at the family level to ensure that gender roles in rice QDS become fair.

In evaluating factors influencing decision-making power in rice QDS, the results showed that decision making power among women in the community was very low. In one way or another, this made decline in rice QDS. The study therefore concludes that there is an opportunity to more farmers to produce and use rice QDS in the study area through proper information dissemination and provision of support and training needed by the

farmers to change women and men’s perception towards decision making power in the family level so as to participate of rice QDS. It is recommended that development practitioners should sensitize community on women's awareness of their rights in decision making and minimize conservative gender-biased understanding of religion and ignorance of socio-cultural principles regarding women. This will increase rice QDS. Areas for further research based on the study findings, some further investigations are hereby proposed as a consequence of the study’s coverage. Based on the study findings, some further investigations are hereby proposed as a consequence of the study’s coverage. Effect of land tenure system and QDS production.

Keywords: Attitude, recycled seed, quality declared seed, improved seed, gender, land access, control, resources.

DECLARATION

I, **NORA ELISAMIA LYIMO,** do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is a result of my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted for a degree award in any other institution.

_____ _____

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The above declaration is confirmed by;

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Dr. Rasel Madaha **Date**

(Main Supervisor)

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Prof. Anna Sikira **Date**

(Co-Supervisor)

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DEDICATION

To God; without your guidance and love this work would not have been possible, and this humble contribution would have never become a reality. It is dedicated to you GOD.

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LIST OF ABBREVIATIONS AND ACRONYMS

DAICO	District Agriculture, Irrigation and Cooperatives Officer
FAO	Food and Agriculture Organization
FGDs	Focus Group Discussions
GAD	Gender and Development
HAF	Harvard Analytical Framework
KI	Key Informants
LGAs	Local Government Authorities
NRDS	National Rice Development Strategy
PABRA	Pan-Africa Bean Research Alliance
QDS	Quality Declared Seed
SPSS	Statistical Package for Social Sciences
TOAM	Tanzania Organic Agriculture Movement
TOSCI	Tanzania Official Seed Certification Institute
UNDP	United Nations Development Program
URT	United Republic of Tanzania
WEO	Ward Executive Officer

CHAPTER ONE

1.0 **Introduction**

1.1 **Background Information**

Gender relations are essential in determining interactions between men and women in agricultural production. Madaha (2018) holds that gender relations refer to complex, culturally and historically specific social systems that organize and regulate interactions between women and men as well as their relative social values. According to Morgan *et al*. (2017), gender refers to socially or culturally established roles of women and men in a community or society. Because gender is a social construct, the roles of women and men may differ from one place or one culture to another and may change over time. For the purpose of this study, gender refers to socially constructed relationships and responsibilities between men and women involved in rice QDS. Gender inequality between men and women is well known in many parts of the world, especially in developing countries (Seleman, 2017). This is reported to be the cause of power imbalance between men and women (Jeckoniah, 2018). Women suffer from different types of powerlessness in social and economic spheres of life (Madaha, 2018).

In Africa, gender discrepancy is more pronounced in rural areas than in urban areas, and women are the main victims (FAO, 2011). Women in Tanzania, like in other developing countries, are underprivileged socially and economically (Jeckoniah, 2013; Madaha, 2018). The government of Tanzania is determined to improve agricultural production and attain gender equality within the agricultural sector. The national Agricultural Policy of Tanzania treats gender as an important crosscutting issue that should be addressed in order to improve agricultural production (URT, 2013).

Improving agricultural productivity involves increasing farmers' access to inputs including quality rice seeds. Ravinder *et al*. (2007) regard improved seeds as "a powerful agent of change," with the potential of making a difference in the lives of the poor and marginalized farmer including women. In addition, having access to good quality seeds could ensure higher productivity up to 40% increase (Abebe and Alemu, 2017). Mligo and Msuya (2015) informed that the supply of quality seeds for many years through formal seed system has not been satisfactory. The majority (90%) of smallholder farmers including marginalized women continue to use recycled seeds (TOAM, 2015). This reveals that seeds produced by formal seed companies are not only expensive and unaffordable by marginalised farmers but they are also not enough to satisfy the requirements (Mlingo and Msuya, 2015). In Tanzania, there are two types of seed systems: (i) the formal system, which is market oriented and developed by the public and/ or private sectors and (ii) community production system, which is mainly based on seed self-provisioning exchanges and gifts among neighbours and the informal system. Production and sale of certified seeds by the formal sector (both public and private) has not been satisfactory to meet national seed demand estimated at 212 274 metric tonne per year (NBS, 2014).

QDS programme in Tanzania was introduced by FAO in the early 2000s to make it possible for production and utilization of quality seeds by rural farmers who were not reached by the formal seed companies in remote areas. QDS refers to a form of quality assurance that was created to reduce the burden of rigorous conventional seed certification, while retaining the basic characteristics of external quality assurance, and thereby increasing access to quality seed for smallholder farmers. QDS are quality seeds produced by small-scale farmers who are trained by Tanzania Official Seed Certification

Institute (TOSCI) under supervision of Seed Inspectors working for Local Government Authorities (LGAs).

QDS is produced by a registered trained small scale farmer or a group of small-scale farmers producing seed for their own use or for sale to the neighbouring farmers within the ward /District where QDS is produced. A QDS producer should have an alternative source of income before starting up the seed production, to avoid economical hardship if there are unanticipated problems, for example, drought,insect pest infestation. The main goal of the programme was to improve availability of improved seeds and hence, increase the use of QDS among smallholder farmers for increased agricultural productivity.

The Tanzanian government is also determined to develop agricultural production and attain gender equality in seed production. The National Agricultural Policy of Tanzania treats gender as an important crosscutting issue to improve agricultural production (URT, 2013). The government states that Tanzanian women constitute the majority of agricultural labour force 90% producing about 70% of the country's food requirements (URT, 2015). Nonetheless, women face a number of challenges related to gender inequality, hence difficult to attain sustainable agricultural productivity (Madaha, 2012). Women continue to face a number of challenges in the sector including inadequate skills and knowledge. They rarely own land, have lower education due to discriminatory access, and their access to productive sources as well as decision-making tends to occur through the mediation of men (Seleman, 2017). Women face decision-making constraints due to cultural, traditional and sociological factors. Their work in the agricultural sector is largely ignored, even though they make up three-quarters of the agriculture work force (FAO, 2015). Other challenges are inappropriate technologies and inappropriate socio-cultural practices and beliefs (URT, 2013). Due to these facts, progress in the agricultural

sector is hindered. This implies that gender meanstraming in the agricultural sector, is of great importance if real progress has to be attained. Therefore, this study examined gender relations in rice QDS to highlight areas for boosting rice QDS among rice smallholder farmers in Kilombero District.

1.2 **Problem Statement**

Women constitute the majority of the labour force in rice production and related activities including planting, irrigating, weeding, harvesting, threshing, winnowing, and sorting. Although men get engaged in such activities, they spend fewer hours than women (Lusuva, 2015). Men are the ones who usually sell the crop products and make decisions on how income is to be spent in the household (Madaha, 2018). Though in some fewer families, men may involve women in some discussions, still men make the final decisions (Lusuva, 2015). As a result, women's access to and control over resources is limited. Further, women lack the power to make decisions related to agricultural productivity including the use of the rice QDS in rice productivity. According to Khahima (2015), there is a relationship between gender relations and increase in agricultural production. This corresponds to the finding of a study by Jeckoniah (2018), which insisted on the need of understanding gender relations in agricultural development activities and how agricultural activities can be increased. Kasente (2012) also observed that gender roles and relations are a key in improving women's lives through agricultural production. The above-mentioned studies concentrated on the relationship between gender and increased agricultural productivity, but none of them considered gender relations in rice QDS especially in Kilombero.

Thus, this study, taking a case of Kilombero District, focused on understanding gender relations in rice QDS to highlight areas for boosting rice QDS among smallholder farmers

bearing in mind that there has been sharp decline of rice QDS in the country (TOAM, 2015).

1.3 **Justification of the Study**

The study is in line with various national and international policies and programmes that focus on different aspects of agriculture. The findings from the study are in line with Sustainable Development Goal (SDG number 2). This goal emphasizes on ending hunger, achieve food security, improve nutrition and promote sustainable agriculture (FAO, 2015). The findings also contribute to SDG Goal number 5 that aims at achieving gender equality and empower all women and girls. This study is further in concordance with the objectives of Tanzania's Agricultural Sector Development Programme (ASDP II), a national key document, which emphasizes on increasing agricultural productivity, profitability and farm incomes (URT, 2016). The study is also in line with National Rice Development Strategy (NRDS), which focuses on food security and achieving self-sufficiency in staple food production (URT, 2013).

The findings have a great potential to help increase awareness of the entire system of rice QDS in Kilombero District and in Tanzania at large. Moreover, the findings are important to agricultural planners, policy makers and implementers towards improving smallholder farmers including women farmer's lives through increased access to quality seeds and equality in decision-making and resources control for the betterment of all family members. Furthermore, the study contributes to the body of knowledge as secondary data (reference) for future studies in agriculture.

1.4 **Research Objectives**

1.4.1 **Overall objective**

The overall objective of the study was to determine linkages between gender relations and rice QDS productivity in Kilombero District.

1.4.2 **Specific objectives**

The specific objectives of the study were to:

(i) Assess gendered access and control over rice QDS resources among rice producers,

(ii) Examine attitude of farmers towards rice QDS,

(iii) Evaluate gender role of men and women towards rice QDS, and

(iv) Analyse factors influencing decision-making power in rice QDS in Kilombero, Morogoro, Tanzania.

1.4.3 **Research questions**

Specifically, the study aimed at addressing the following research questions:

(i) To what extent do men and women have access and control over resources among farmers in rice QDS?

(ii) What is the attitude of farmers towards rice QDS?

(iii) What are the gender roles in rice QDS among smallholder farmers?

(iv) Which factors and how do they influence decision-making power among QDS rice producers?

1.5 **Literature Review**

1.5.1 **Definitions of key concepts**

1.5.1.1 **Gender**

Gender is defined as socially constructed roles and status of women, men and youth (Morgan *et al*., 2017); it is a set of culturally accepted specific characteristics defining the social behaviour of women and men, and the relationship between them.

1.5.1.2 **Gender relations**

Gender relations refer to the complex cultural and historical specific social systems that organize and regulate interactions between women and men, as well as their relative social values. They simultaneously encompass ideas, practices, representations, and identities that pertain to gender (Cook, 2007). Men and women interact and relate with each other on the basis of these normative role requirements. The structure of these kinds of interactions can also be called gender relations or gender arrangements (Cook, 2007). For the purpose of this study, gender relations influence how communities, households and institutions are organized, decisions are made and resources are used (Moser, 1993).

1.5.1.3 **Gender equality**

Gender equality is achieved when different behaviour, aspirations and needs of women and men are considered, valued and favoured equally. It does not mean that women and men have to become the same, but that their rights, responsibilities and opportunities will not depend on whether they are born male or female (Njuki *et al.,* 2011).

1.5.1.4 **Quality declared seed**

Quality declared seed (QDS) refers to a form of quality assurance that was created to reduce the burden of rigorous conventional seed certification process, while retaining the

basic characteristics of external quality assurance, and thereby increasing access to quality seed for smallholder farmers (TOAM, 2015).

1.5.1.5 **Quality seed**

Quality seed is defined as varietal pure with a high germination percentage, free from disease and disease organisms, and with a proper moisture content and weight. Quality seed ensures good germination, rapid emergence, and vigorous growth (Hasanuzzaman, 2015).

1.5.1.6 **Quality Declared Seed (QDS) seed system**

Seed systems are a vehicle through which farmers get good quality seed of new crop varieties they want and need (PABRA, 2017).

1.6 **Empirical Studies**

1.6.1 **Gender relations in agricultural production**

According to Khahima (2015) and Kasente (2012) whose study used a cross-sectional research design, there is a relationship between gender relations and increase in agricultural production. They both insisted on the need of understanding gender relations in agricultural development activities and how the activities can be increased. Rahman (2008) pointed out that gender relations make a significant contribution to food production and processing and that men exercise more control over decisions and productive resources from the farms. Rahman further maintained that full participation of women is required so as to increase agricultural productivity. Therefore, gender relations should be improved at the household level since the improvement will lead to increase in agricultural productivity. Although these studies focused on gender relations in agricultural production, they have not focused on rice QDS.

1.6.2 **Gender constraints on access to and control over resources in agriculture**

It is well recognized that ownership of assets improves the lives of men and women who own and control them (Roy *et al.,* 2015). Generally, assets are fundamental to smallholder farmers' livelihoods. Thus, there is a growing interest in understanding how assets help these farmers expand production and successfully engage in agricultural production in the developing world (Johnson *et al.,* 2016). In most developing countries, both male and female farmers do not have equal access to resources. Women's access is even more limited due to cultural, traditional and sociological factors (Thabit, 2014). Although previous studies have focused on access and control over resources in rice production, they have not focused on rice QDS.

1.6.3 **Attitude of smallholder farmers towards rice production**

Attitude is a state of mind or a tendency to act in a particular way due to both an individual's understanding and temperament (Pickens, 2005). Attitudes enable us to describe how we see situations, as well as define and act towards a situation or object. Attitudes include feelings, thoughts, and actions. Attitudes may simply be an enduring evaluation of a person or object (Fakhi, 2015).

There are different explanations for apparent negative response of improved rice seed by farmers; these include negative attitudes towards improved seed, inadequate knowledge and lack of information on the importance of using improved seeds (Suhan *et al*., 2008). Knowledge influences acceptance; farmers who have adequate knowledge of a technology are likely to accept it (Abebaw and Belay, 2001). Farmers' attitudes determine acceptance\ rejection of improved technologies. Attitudes are evaluative responses towards a technology and are formed as farmers gain information about it. Although some

previous studies have focused on attitude towards rice production, they have not focused on farmers' attitude towards rice QDS.

1.6.4 **Gender roles in agricultural production**

In Sub-Saharan Africa, women, men and youth are responsible for selling cash crop products along with some help from other household members. However, women do not get control over the income (Godfrey, 2010; Okali, 2014). This is mainly because the rural households and marketing institutions work within a wider framework of patriarchal systems that are tilted in favour of men's control of major household resources. Sometimes women play a role in suggesting and decision-making in the household but men make the final decision (Njiku, 2011). Although these studies are interesting, they have not focused on gender roles in rice QDS.

1.6.5 **Factors influencing decision-making power in rice production**

Traditionally, women have limited roles in decision-making processes and laws, which are important for poverty reduction, food security and environmental sustainability (FAO, 1990). The causes of women's exclusion from decision-making are closely linked to their additional reproductive roles and their household workload, which account for an important share of their time. Though women play a major role in food decisions in many cultures, it is increasingly recognized that research needs to target both women and men with utilization message, given the roles that men often play in influencing women's decision-making (Tsikata and Yaro, 2014). Women are less empowered compared to men in many aspects such as education attainment, income, control over own income, bargaining power in selling and labour, participation in decision making bodies, access to production inputs and employment opportunities (Jeckoniah *et al.,* 2012; Thabiti, 2014). Although previous studies have focused on factors influencing decision-making power in

rice production, they have not focused on factors that influence the decision power towards rice QDS.

1.7 **Theoretical Framework**

The study on which this thesis is based was guided by the Gender and Development (GAD) theory. GAD is a feminist international development theory, which was developed from the work of socialist feminist and civil societies, particularly those residing and interested in developing countries (Moser, 1993; Parpart *et al.,* 2000 cited in Madaha, 2017). As an analytical framework, gender analysis encompasses information on men and women in terms of their roles, responsibilities, access to and control over resources, and opportunities, as well as hidden power structures that govern the relationships between them. Gender relations in most societies tend to influence access of men and women to critical resources necessary for their development. However, the elements are also important since gender relations in rice QDS consider gender as an important aspect that can hinder development (UNDP, 2010). Therefore, for the rice QDS to be achieved among smallholder farmers, it is very important to integrate gender at all levels. As such, GAD, as a strand of socialist feminist, is in a position to better help examine the existing gender inequalities and opportunities in the distribution of resources, responsibilities and power across rice QDS in Kilombero District.

1.8 **Conceptual Framework**

The conceptual framework of the study (Figure 1.1) was modified from the Gender and Development (GAD) theory. The version of the conceptual framework used is a strand and tool of socialist feminist known as Gender and Development (GAD) which represents gender and responsibility, access to resources, control over resources, gender roles, decision-making and technology as important elements to increase development. The independent variables of the study are gender relations in rice QDS, which include gender

roles, access to and control of resources, decision-making, attitude towards rice QDS and factors influencing decision making in rice QDS. It is believed that the variables have a direct influence on the dependent variable, which is rice QDS productivity levels (kg/ha).

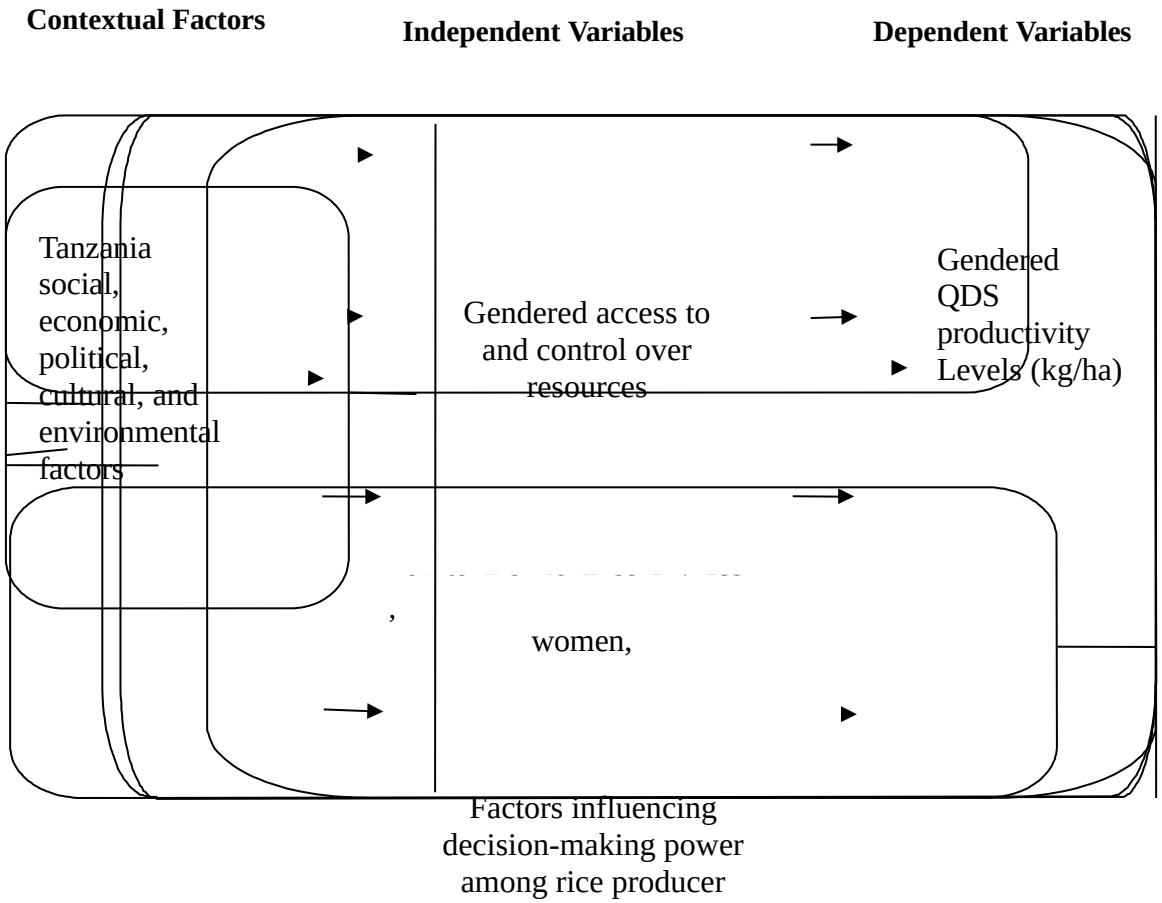

Figure 1.1: Conceptual framework of gender implications on QDS productivity.

1.9 **Methodology**

1.9.1 **Description of the study area**

The study was conducted in Kilombero District, which is one of the seven Districts of Morogoro Region in Tanzania (Figure 1.2). The district is located between 9°and 7° latitudes South of the equator and between 35° and 37° longitudes East of the Greenwich. The district lies on an altitude of 58 to 2537 metres above sea level (KDC, 2019). The justification for selecting Kilombero District was that, it is one of the districts that the

country mainly depends on for the supply of rice (Mligo and Msuya, 2015). The district generally experiences high temperatures (26º to 32ºC) and has a bimodal rainfall pattern

where by the short rains begin towards the end of November and end in January or February, while the long rains usually start in March and end in May or June. The rainfall ranges between 1200 to 1600 mm. The district's soil type is characterized by alluvial, lowlands covered mostly by heavy clays as a result of periodical/permanent flooding. According to Tanzania's 2012 Population and Housing Census, Kilombero District had a total of 407 880 people who included 202 789 male and 205 091 females. The main occupation of the people in Kilombero District is agriculture. About 80% of the population are engaged in agricultural production, mainly at the subsistence level.

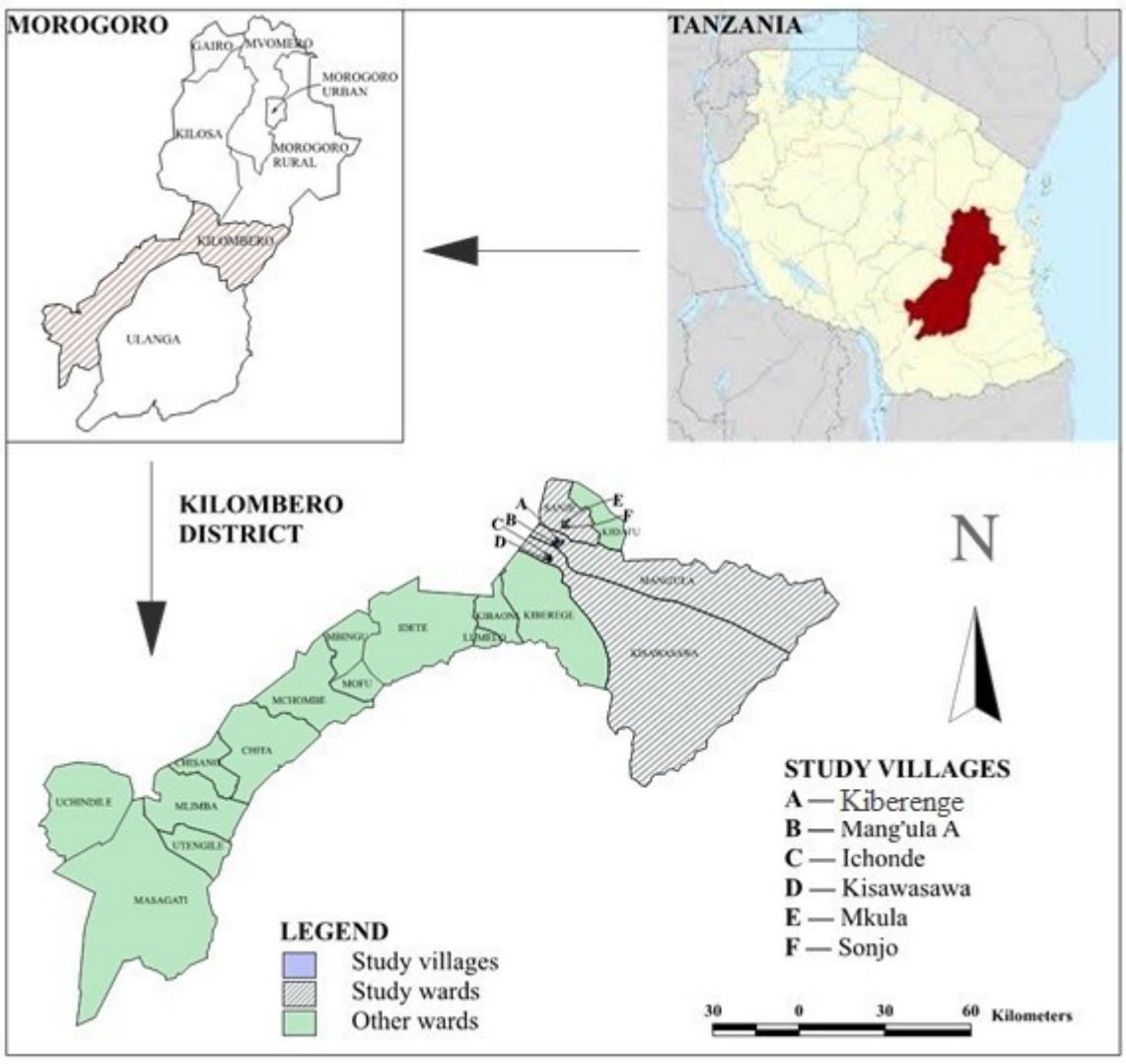

Figure 1.2: Map of study area in Morogoro Region

1.9.2 **Research design**

The study employed a cross-sectional research design whereby data were collected at a single point at a time from a sample selected to represent some large population (Kothari, 2004). The design is suitable for description purposes as well as determination of relationships between and among variables. `

1.9.3 **Population, sampling procedure and sample size**

The population for this study consisted of all rice farmers in Kisawasawa, Mang'ula and Mkula Wards in Kilombero District Council. The study adopted a multi-stage sampling technique as suggested by Verstraete and Meirvenne (2008). First, the district was purposively selected based on the reasons stated above. Secondly, purposive sampling technique was used to draw a sample of three wards from the list of 35 wards in Kilombero District, based on the production potential of rice in the district. Thirdly, two villages were randomly selected from each ward. The list of wards was obtained from the District Planning Office while the lists of villages in each ward were obtained from Ward Government Offices (Table 1.1).

The sample size was determined by using Yamane's (1967) formula as follows;

$1+ N (e)$ $1+14537 (0.05)$ 37.3425

n is the sample size,

N is the estimated number of farmers' in the 6 selected villages, and

e is sampling error at the 95% confidence interval, which is 0.05.

To ensure that the number of sampled smallholder farmers in a particular village was proportional to the total number of farmers the village, proportionate random sampling was applied using the following formula (Hansen *et al.*, 1953):

$$a = \frac{q}{Q \times b}$$

Where: a = sample size for each village, q = total number of sampled farmers for the 6 villages, Q = targeted farmers for the 6 villages and b = targeted farmers in each village. The sampling frame included farmers engaged in rice production in six villages. Random sampling procedure was used to select a representative sample of QDS rice producers. It was intended initially to conduct an interview with 389 respondents as from the formula above. Unfortunately, because the response rate was low, the study ended up collecting data from 218 farmers.

Table 1.1: Number of sampled farmers in each study village (NBS, 2014)

Wards	**Village**	**Total number of farmers (*N*)**	**Sampled farmers (*n*)**	**% of total**	**Respondents (n) attendend**
Kisawasawa	Kisawasawa	2437	2437/14 537 x 389 = 65	16	35
	Ichonde	2322	2322/14 537 x 389 = 62	16	26
Mang'ula	Mang'ula A	2983	2983/14 537 x 389 = 107	26	42
	Kibereng e	3992	3992/14 537 x 389 =109	28	64
Mkula	Mkula	1601	1601/ 1 537 x 389=43	11	33
	Sonjo	1202	1202/ 14 537 x 389=32	8	18
Total		**14 537**	**389**		**218**

Besides the above number of respondents, fifteen key informants were selected for in-depth interviews. They included: One District Agriculture, Irrigation and Cooperatives Officer (DAICO); two Subject Matter Specialists (SMS); one Director of Kilombero

Agricultural Training and Research Institute (KATRIN); one representative from Nafaka Project; four Extension Officers; two ward Executive Officers (WEO) two village leaders and two rice processors.

1.9.4 **Data collection methods and tools**

Both primary quantitative and qualitative data were collected. A questionnaire was employed to collect quantitative data from rice farmers. The unit of analysis was an individual farmer. The questionnaire was designed to have closed- and open-ended questions to solicit information from respondents. A checklist of questions was designed to collect primary data from key informants (KI) and FGDs. Data collection from FGDs and KIs was done by jotting down participants arguments in notebooks and by recording the same using a voice recorder with the permission of the participants. The informed consent of participants was sought verbally.

A Likert scale was employed to examine the attitude of farmers towards rice QDS. Frequencies and percentages were used to gauge the general attitude of farmers towards QDS rice whereby 15 statements (with positive and negative connotation) were formulated for measuring attitude of farmers. To achieve this, a 5-point Likert type scale was used. The 5 scores were assigned values as follows: strongly agree which was assigned the value of 5, Agree which was assigned the value of 4, Undecided which was assigned the value of 3, disagree which was assigned the value of 2 and strongly disagree which was assigned the value of 1. In case of negative attitudinal statements, reverse score was assigned to each response. Then responses were grouped into three categories: strongly disagree and disagree into disagree; strongly agree and agree into agree while neutral (3) were left to stand-alone.

1.10 **Analysis of Quantitative Data**

Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) computer software version 20. The collected data were coded and entered into computer (SPSS), and data cleaning was done. Based on the specific objectives of the study, the quantitative data that were collected were analysed as explained in Table 1.2.

1.11 **Analysis of Qualitative Data**

The qualitative data were analysed using content analysis. The researcher prepared and organised the collected information before embarking on actual analysis process. This process helped to systematically condense the data set into manageable and analysable categories of issues based on the study objectives (Bazeley, 2013).

Table 1.2: Data analysis by the specific objectives

S/N	Objective number	Data collected	Data collection methods	Data analysis techniques
1	To examine gendered access and control over resources among smallholder farmers in rice QDS	Data on who has access to and control over which resources	• Semi-structured interviews (FGDs and KIIs). and • Harvard access and control framework	Descriptive statistical analysis.
2.	To evaluate attitude of men, women and youth towards rice QDS	Farmers' attitude towards rice QDS	• Semi-structured interviews (FGDs and KIIs)	• Five-point Likert scale, • Descriptive analysis • Content analysis
3	To assess gender roles in QDS among smallholder farmers	Disaggregated gender data on women's and men's and youth's roles	• Semi-structured interviews (FGDs and KIIs), • Documentary review, and • Harvard analytical framework	• Descriptive statistical analysis.
4.	To analyse factors influencing decision making power rice QDS	Factors influencing decision making power over QDS	• Semi-structured interviews (FGDs and KI interviews) • Decision making index	• Descriptive statistical analysis, • Multiple linear regression model

Objective number one: Aimed at soliciting information on gendered access and control over resources among smallholder farmers in rice QDS. Harvard Analytical Framework (HAF) was used. The framework guided collection of information related to gender access and control over resources in rice QDS. Also, access and ownership of assets by men and women and their contribution to family income and expenses were analysed. Respondents were asked to indicate which of the listed resources they were able to access and control. Also, assets were listed, and men and women were asked to comment on their access and

ownership. The assets included land, bicycle, television, radio, sewing machine, house, gold, local cattle, dairy cattle, poultry and goats. In addition, frequency and percentages were used to analyse access and control over resources among smallholder farmers in rice QDS.

For objective number two: A Likert scale was employed to evaluate the attitude of men and women towards rice QDS. Frequencies and percentages were used to gauge the general attitude of farmers. 15 statements (with positive and negative connotation) were formulated for measuring attitude of farmers. To achieve this, a 5-point Likert type scale was used. The 5 scores were assigned strongly agree, while scores 4, 3, 2 and 1 were assigned agree, neutral, disagree and strongly disagree respectively. In case of attitudinal statements which had negative connotations, reverse score was assigned to each response by swapping responses 1 and 5, and swapping responses 2 and 4. Then responses were grouped into three categories: strongly disagree and disagree into disagree; strongly agree and agree into agree while neutral (3) were left to stand-alone.

Objective number three: Aimed at soliciting information on gender roles in rice QDS. Harvard Analytical Framework (HAF) was used. The framework guided the collection of information related to gender role activity profile. Respondents were asked to indicate which of the listed activities they were engaged in during rice QDS. This was assessed descriptively whereby frequencies and percentages were computed.

Objective number four a: To assess decision-making power of men and women involved in rice QDS. Items were identified, men and women were asked to identify who were making decisions concerning land size to cultivate, types of crops to be grown, decision on what to produce, where to sell and how much to spend, purchasing inputs,

selling agricultural products, amount to sell and selling price, utilization of income from sales, purchasing food, purchasing assets and luxury items, and joining SACCOS. The first one was family decision making on rice QDS and resources distribution.

The second one was women's freedom of movement whereby men and women were asked to score who was making decision on the following movements; attending training, participating in training trip, and going to the market. When the decision was taken jointly by husband/male and wife/female or when the decision was taken by female alone or male alone.

Objective number four b: Quantitative data were statistically analysed using Statistical Package for Social Sciences (SPSS) computer software. The entered data into SPSS were run to perform descriptive statistics (i.e. frequency tables, mean and standard deviation); Multiple linear regressions were used to determine influence of gender relations factors on rice Quality Declared Seed (QDS). The multiple linear regression equation that was used was specified as follows:

$Y = b_0 + b_1X_1 + ... b_{12}x_{12}$

Y = QDS rice productivity (kg/acre),

β_1 to β_{12} = coefficients of the independent variables,

X_1 to X_{12} = independent variables entered in the multiple linear regression model,

The independent variables were measured as follows:

1. Age of the farmer: number of years since birth;
2. Sex: being male or female (1 = Female, 0 = Male);
3. Education level: 0 = No formal education, 1 = Primary education, 2 = Secondary 3. College education, 4 = Graduate and above;
4. Marital status: 1 = Married, 0 = Single);

5. Household size: Number of people living in a household and eating from the same pot;
6. Farm size and area used to grow rice QDS: Acres;
7. Off farm income: Tanzanian Shillings (TZS);
8. Access to credit: whether the respondents had received financial support for QDS production in the form of credit from formal or informal institutions. (1=Yes, 0=No);
9. Access to agro dealers: whether respondents had access to agro dealers (1=Have access, 0=Not);
10. Access to improved seed: 1 = Have access, 0 = Not;
11. Access to fertilizer: 1 = Have access, 0 = Not);
12. Access to pesticides: 1 = Have access, 0 = Not);
13. Access to QDS production training: 1 = Have access, 0 = Not;
14. Membership to agricultural organization: whether respondents were members or non-members of different agricultural organizations (1 = member, 0 = Not a member);
15. Distance to market place: Km from respondents' residence to the nearby market place;
16. Distance from rice QDS farm to the neighbourhoods' farms: metres;
17. Storage facilities: 1 = Have, 0 = Not; and
18. QDS quality: Germination percentage 1 = above 80%, 2 = below 80%.

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CHAPTER TWO

2.0 **Gendered Access and Control over Quality Declared Seeds (QDS) Resources among Rice Producers in Kilombero District, Morogoro, Tanzania**

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Abstract

Quality Declared Seed for increased agricultural productivity is pertinent to farmers. This paper assesses gendered access to and control over QDS resources among rice producers. A cross-sectional research design was used, whereby a questionnaire was administered to 218 rice farmers in Kilombero District. Focus group discussions and key informant interviews were conducted to complement and allow triangulation of the data. Descriptive statistics were analysed using SPSS, while qualitative data were analysed using content analysis. SPSS computer software was used to compute descriptive statistics. The results showed that women have more access to some resources such as credit as opposed to men. However, it was revealed that men control most of the resources including those in women's accessibility. Women (45%) were found to have more access to credit than men (13%) did. On the other hand, men were found to have more access to inputs (22%) and agriculture training (29%) than women. Women in the study area had access to land too but lacked control over it. Cultural barriers strongly affected and influenced ownership of resources including land, for rice QDS among women farmers. It is concluded that women get fewer benefits in rice QDS due to poor access to and control of productive resources. There is a need to remove all cultural barriers by creating awareness for both men and women using gender sensitive programmes.

Keywords: Gender, land access, control resources, quality declared seeds.

2.1 **Introduction**

The Tanzanian government is determined to improve agricultural productivity as a source of raw materials for industries and attain sustainable development. The National Agricultural Policy of 2013 treats gender as an important cross-cutting issue to improve agricultural production (Mnimbo, 2018). Gender refers to socially constructed relations

and responsibilities between women and men (Madaha, 2012, 2018). Tanzanian women constitute the majority (over 90.4%) of agricultural labour force producing about 70% of the country's food requirements (FAO, 2015). However, most farming and livestock keeping activities have been socially assigned to women. Consequently, women face many challenges including lack of credit, improved seeds, pesticides and fertilizers. Women are further constrained by limited educational background, poor networks and mobility restrictions. The capacity of women farmers to employ improved technology and investment depends on their access to and control over productive resources. An important element for improving agricultural productivity is to increase farmer access to improved technologies. Even though, if incomes of women increase, they may have more access to resources. In turn, they can invest in their children's education, health care and nutrition (Sikira and Kashaigili, 2016). Both men and women contribute significantly to agricultural production; yet, women's access to and control over these agricultural productive resources are limited (Thabit, 2014). The term access to resources means that both women and men are able to use and benefit from specific resources (material, financial, human, social and political). Control over resources means that both men and women have access to a resource and also can make decisions on the use of those resources. For example, control over land means that women can access land (use it), own land (can be the legal title-holders) and make decisions about whether to sell or rent the land. Important resources for rice QDS are; enough land to allow four meter isolation distance surrounding the farm to avoid cross polination, availability of water through out the season, this is because the QDS(saro) variety is delicate do not need water stress, labour intensive, need to sow seed in the nursery and there after transplanting to the main field followed by weeding two to three times in the season, Fertilizers are needed before planting and before flowering, Pesticides are needed to the entire season in case of an insect pest out break, and seed used is Quality Declared Seeds QDS (Pre basic, Basic,

Certified I). This is different from normal rice production where by land for isolations are not needed, availability of water are needed but not as much as for rice QDS, not labour intensive, not need nursery or transplanting activities(if you like), farmers are normally use broadcating method,weeding can be done once or twice,fertilizers and pesticide can be used or not, seed used can be improved or local.

An important productive input, among others, includes Quality Declared Seeds (QDS). QDS refers to seeds subjected to a form of quality assurance that was created to reduce the burden of the rigorous conventional seed certification process, while retaining the basic characteristics of external quality assurance. This was meant to increase access to quality seed for smallholder farmers. Smallholder farmers refer to people who provide labour, management and own/control the small landholding they farm (Loserian and Jeckoniah, 2018). QDS are produced by small-scale farmers who are trained by Tanzania Official Seed Certification Institute (TOSCI) (TOSCI, 2018) under supervision of Seed Inspectors working for Local Government Authorities (LGAs) (TOAM, 2015). This kind of production needs a lot of administrative procedures whereby the farmer has to be registered at TOSCI. However, studies focusing on gendered access to and control over QDS resources especially within the Tanzanian context are rare. The existing studies have focused on access to and control over land by Barume, (2014), Loserian and Jeckoniah, (2018), and gendered access and control over land and water resources by Sikira and Kashaigili, (2016). Other recent studies focused on agricultural productivity (Doss, 2018), rice yield (Kulyakwave1, and Shiwei1, Yu1, 2019), adoption of recommended rice varieties (Mligo and Msuya, 2015), and agricultural land use planning (Massawe *et al.*, 2020). However, none of the studies has focused on gendered access to and control over QDS resources. Gender difference arising from socially constructed relations between

men and women, affects the distribution of agricultural resources and causes many disparities in development outcomes (Mnimbo, 2018).

Further, women face several challenges, most importantly cultural barrier restrictions in accessing land compared to men. Women control land that is often of poorer quality within secure tenure (Sikira and Kashaigili, 2016). This was also reported by Mehra and Rojas (2008) that women were able to access only one per cent of credit in the agricultural sector as a result of lack as collateral. Equally, in cases where rice QDS equipment suitable for rice QDS are available, the majority of women are either unaware or do not have enough funds to purchase them. They therefore continue to use old methods such as use of hand hoes, which decrease their speed of work and productivity (World Bank, 2012).

Other challenges which face women farmers are that often their work in the agricultural sector is largely ignored (FAO, 2015) and application of inappropriate technologies and discriminating socio-cultural practices and beliefs (URT, 2013). Due to these facts, progress in the agricultural sector is hindered. Scholars like Massawe *et al.* (2020), Jeckoniah (2019), Sikira and Kashaigili (2016), and Thabit (2014) have studied gender access to and control over agricultural resources and gender analysis in rice production. However, the studies were predominantly quantitative. Besides, little has been documented on gendered access to and control over resources among rice QDS farmers in Kilombero District. Thus, the study on which this paper is based assessed gendered access to and control over rice QDS resources among rice producers so as to highlight areas for boosting QDS production among smallholder farmers in Kilombero District.

2.2 **Theoretical Framework**

Socialist feminism informs this article. The theory recognizes oppression of women within multiple identities such as race, sexuality, ethnicity, gender, and nationality. That is, socialist feminism recognizes that gender oppression is context specific. In this regard, socialist feminism synthesizes women's oppression by capitalism and patriarchy. It calls for inclusive movements by the oppressed women such as working-class women and rural peasants in collaboration with interested men to transform power relations in favour of a more just society. The GAD strategy is a strand of socialist feminist theory that has become a buzz word in the Global South including Tanzania (Moser, 1993; Parpart *et al*., 2000; Kabeer, 2003; Brenner, 2014; Madaha, 2018). Informed by socialist feminism, this paper explores gender roles, responsibilities, access to and control over resources, and opportunities, as well as hidden power structures that govern the relationships between them. Gender relations in most societies tend to influence access of men and women to critical resources necessary for their development. However, the elements are also important since gender relations in QDS rice production consider gender as an important aspect that can hinder development (UNDP, 2010). Therefore, for QDS rice production to be achieved among smallholder farmers, it is very important to integrate gender at all levels. As such, GAD, as a strand of socialist feminist theory, is in a position to examine the existing gender inequalities, and opportunities in the distribution of resources, responsibilities and power across QDS rice production in Kilombero District. According to World Bank (2012), gender inequality is the difference between men and women in terms of opportunities or unequal treatment or perceived differences based solely on issues of sex.

2.3 **Methodology**

The study on which this paper is based was conducted in Kisawasawa, Mang'ula and Nkula Wards in Kilombero District, Tanzania. The rationale for choosing Kilombero District was: (i) Presence of farmers registered for rice QDS (TOSCI, 2018) and (ii) The district being one of major rice production and supply districts in Tanzania (Mligo and Msuya, 2015). The population for this study consisted of all rice farmers (also referred to as rice producers) of Kisawasawa, Mang'ula and Nkula Wards in Kilombero District Council. The study employed cross-sectional research design whereby data were collected at a single point of time.

The unit of analysis was an individual farmer producing and utilizing QDS.These involve farmers who at same point in their life participated in QDS production, individual or in a group. A representative sample was drawn from all rice farmers who were producing and utilizing rice QDS. The sample size was determined by using Yamane (1967)'s formula. Simple random sampling procedure was used to select a representative sample of rice producers. A sample of 389 smallholder rice farmers was randomly chosen. To ensure that the number of sampled smallholder farmers in a particular village was proportional to its total number of farmers, proportionate stratified random sampling was applied. However, a sample of 218 was available during the survey for interview.

Both primary and secondary data were collected for the study. Primary data were mainly collected by using quantitative and qualitative methods. A semi-structured interview guide was employed to collect qualitative and some descriptive data. A structured questionnaire comprising closed, and open-ended questions was designed to solicit information from respondents. Harvard Analytical Framework (HAF) was used to guide collection of information related to gendered access and control over resources in rice QDS.

Data entry and cleaning were done after data collection. Quantitative data were analysed using Statistical Product and Service Solutions (SPSS) version 20. Specifically, SPSS was used to generate descriptive statistics including percentages. Qualitative data were analysed using content analysis. All of the data were presented in line with the study objectives.

2.4 **Results and Discussion**

The results in Table 2.1 show that the maximum age of the respondents was 61 years while the minimum age was 18 years. A good proportion (68.8%) of the respondents fell within the age groups 25-34, 35-44 and 45-54 years, meaning that the majority of the respondents were within the economically active age category. One of the explanations of the findings is that the majority of rice producers were young people. The results also show that more than half (51.4%) of the respondents were male as opposed to 48.6% female. This suggests slightly dominance of male in the QDS rice farm sector.

Concerning educational level, the majority (95%) of the respondents were literate with qualifications ranging from primary education to college/tertiary level, while only 5.0% of the respondent had no formal education. Education level is useful to measure the ability of a person to utilize the available information to increase production, also to influence major decisions being taken in household and farm management (Thabit, 2014)

Table 2.1: Social-demographic characteristics

Variable	Frequency	Percent
Age of respondents		
18-24	21	9.6
25-34	44	20.2
35-44	61	28.0
45-54	45	20.6
55-60	34	15.6
61 and above	13	6.0
Sex of respondents		
Male	112	51.4
Female	106	48.6
Education level of respondent		
No formal education	11	5.0
Primary education	170	78.0
Secondary education	34	15.6
College education	2	0.9
Graduate and above	1	0.5
Marital status		
Married	157	72.0
Single	32	14.7
Divorced	2	0.9
Widow/Widower	12	5.5
Separated	10	4.6
Cohabit	5	2.3

A literate society is better in understanding and competent in performing different activities including rice QDS production. Thus, education level is one of the basic measures which can be used to decide the status of the society. Low level of education explains powerlessness in social and economic spheres of life. Lack of power is reflected in less control over income, bargaining power in selling own produce and labour (Jeckoniah *et al.*, 2012).

Less education makes it difficult for women to gain access to and use some of the other resources, such as land, improved seed, credit and fertilizers (Madaha, 2012, 2018). Less

education also prevents women from adopting new technologies as readily as men do (Fakih, 2015; Kulyakwave1 *et al*., 2019). Equally, women have inadequate skills and knowledge due to discriminatory access to productive sources (Ellis, 2000). These findings are also supported by Kulyakwave1 *et al*. (2019), who pointed out that adequate education could help farmers in technology acceptance and accessing extension services.

Furthermore, the survey results indicated that the majority (72%) of the respondents were married, while less than one-third (28%) were divorced, single, widows/widowers, separated/divorced and cohabiting. One explanation of the study is suggesting that the society is matrimonially stable. A study by Kulyakwave1 *et al*. (2019) revealed that marital status of farmers has significant influence on rice yields. The findings also imply that married couples are more experienced and are capable of sharing knowledge and capital to influence yield. These findings are consistent with some past quantitative findings reported by some scholars (Ogunmefun, 2015; Mwatawala, 2016; Ngailo *et al*., 2016; Mango, 2018; Otekhile, 2019). The results also support a thesis by Kulyakwave1 *et al*. (2019) who noted that higher number of household size could contribute more to the households' welfare if all are engaged in rice QDS.

2.5 **Gendered Farm Ownership**

Slightly more than one third (34.9%) of the households surveyed rented land, while 31.2% had bought their farmlands and 19.7% had inherited the farmlands. Another segment indicates that 14.2% borrowed land from their families. Families owning land have wider chances to practise crops diversifications, and could lease land to other families. In return, the received money helps to cover some farm operations such as weeding, fertilizer and improved seed purchases and also irrigation.

The distribution of the farm sizes showed that 26.2% had farm sizes in the range between 0-0.8 ha, while 48.6%, 15.6% and 6.4% had farm sizes ranging from 0.8-1.6 ha, 1.6 - 2.4 ha, and 2.4- 4.4 ha, respectively. Only 3.2% of the respondents had farm size within the range of 4.5 ha and above. The findings indicate further that farmers own farm size less than 4.5 ha. Farm size in this case is the total area of the cultivated land measured in units like acre. According to Sikira and Kashaigili (2016), there is a positive relationship between farm size and increase in food production. The view has been reflected in this study. The larger the farm size, the higher the expected level of food production. It is also expected that farmers with larger farmland would produce rice QDS since QDS requires enough land for isolation. That is, women can only engage in QDS production if they own a relatively large plot of land.

The findings reveal some key challenges in the ownership of farms. For instance, 33.5% of the respondents grew rice on farms owned by their parents. The majority of the parents (i.e. 82%) were men. Further, 25.5% of the respondents grew rice on farms owned by husbands. Given the patriarchal culture in the district, women can easily lose access to such farms. Sadly, only 7.8% of the respondents grew rice on farms owned by wives. Farms which were jointly owned by husbands and wives were only 2.3%. This is a very small proportion. The disturbing results indicated that 30.9% of the respondents cultivated farms owned by non-family members. This finding implies that such peasants are vulnerable because they can end up losing such access. Again, women are disproportionately affected because 76% of such farms were owned by men. Overall, the results imply that men have dominance over women in farm ownership. This means, there is a need for women to be assisted in ownership of farm. Farm ownership can serve as collateral for accessing credit. The findings are in line with a similar study by Sikira and Kashaigili (2016) who pointed out that lack of control of land endangers women's ability

to improve their livelihoods. However, the study did not focus on QDS; instead it focused on gendered access and control over land and water resources in the Southern Agricultural Growth Corridor. Overall, the constraints to land ownership also affect rice QDS farmers as they cannot use their land to access loan from financial institutions. A unique finding of the study is that access to rice QDS is not sufficient in absence of farm ownership. Further, for rice QDS production to be efficient and effective, there is a need to address gender inequalities among rice producing communities.

2.6 **Gendered Access to and Control Over QDS Resources**

The term access refers to a situation in which a person can use a resource such as land for growing crops without having control over it (Dancer and Sulle, 2015). On the other hand, control allows a person to make decisions on profitable ways of using such resources. Table 2.2 indicates that women had more access to land (22.0%) than men (16.1%). Further, although access to credit was very low among farmers in the area, women (45%) had more access to credit than men (13%) did. On the other hand, men had more access to inputs (22%) and agricultural training (29%) than women did (17.9% and 16.9%).

Table 2.2: Access to QDS productive resources

Variables	Gender							
	Men		Women		Men & Women		None	
	No.	%	No.	%	No.	%	No.	%
Access to land	35	16.1	48	22.0	111	50.9	24	11.0
Access to inputs (i.e. QDS)	49	22.5	39	17.9	83	38.1	47	21.6
Access to credit	13	6.0	45	20.6	75	34.4	62	28.4
Access to agricultural training	64	29.4	37	17.0	67	30.7	51	23.4
Access to extension services	65	29.8	36	16.5	77	35.3	40	18.3
Access to technology	58	26.6	31	14.2	65	29.8	64	29.4
Access to hand hoe	40	18.3	48	22.0	108	49.5	22	10.1
Access to Ox plough	43	19.7	27	12.4	81	37.2	67	30.7
Access to backpack sprayer	69	31.7	38	17.4	77	35.3	34	15.6
Access to bicycle	38	17.4	36	16.5	106	48.6	38	17.4
Access to motorcycle	56	25.7	31	14.2	71	32.6	60	27.5
Access to vehicle	45	20.6	27	12.4	64	29.4	82	37.6
Access to tractor	67	30.7	36	16.5	80	36.7	35	16.1
Access to bank account	34	15.6	23	10.6	70	32.1	91	41.7

Key: n= 218

The point most fundamental is that input access is important in rice QDS because it ensures increased production. The finding implies that women with less access to inputs can experience reduced productivity per acre as compared to men with access.

These finding shows that agricultural productivity is affected if women have less access to farm inputs. The finding is consistent with Doss (2018), whose study had a similar conclusion. According to Umuhoza (2012), the capacity of an individual to engage in

QDS rice production normally depends on access to productive resources. Findings from FGD showed that women require enabling environment to make sure that they have access and control over resources in order to increase production and utilization of QDS. The findings contradict those by Akter *et al*. (2016) who found that in some South-East Asian countries, there is no evidence of a gender gap in terms of access to and ownership of resources.

In terms of access to credit, women enjoyed better access to credit (20.6%) than men (6.0%). Concerning control of credit, men had more control (26.6%) than women (12.8%). The findings are consistent with a study by Seleman (2017) whereby it was found that many Government initiatives attempt to increase access to credit but they ignore gender empowerment. A useful initiative would be one which allows women to own collateral.

In terms of bank accounts, men also dominate in access (15.6%) and in control (23.4%) over bank accounts. Key informant interviews revealed that women in the society are not given much opportunity to control finances within their family. One of the key informants summarized the views captured in other key informant interview by saying:

> *"I do not ask my husband about money for agriculture. I know that he will not provide me with such money. In the beginning of the farming season, I normally go and borrow money from our community bank known as Village Community Bank (VICOBA) for land preparation, harrowing, planting, weeding and harvest. Also, I buy inputs such as improved seeds, fertilizers, herbicides and pesticide etc.". (A female key informant, QDS producer at Nkula village, Kilombero District, Morogoro, 23/10/2019.*

The findings are consistent with those reported from FGDs. The findings from FGDs indicated that women hardly make decisions on finances within their households. Some women who attempted to inquire on financial resources from their partners became victims of Gender Based Violence. One explanation of the finding is that women lack control over financial resources in such patriarchal households. Instead, they rely on external informal sources such as VICOBA to meet some of their financial needs. They do so to avoid quarrelling with their partners. The findings compare well with other scholars (Thabit, 2014; Fakih, 2015). Fakih (2015) reports that, women depend on their own means to get things done during the agricultural production season. Thabit (2014) is of the opinion that women have more difficulties than men in gaining access to resources such as land, credit and productivity enhancing inputs such as QDS and extension services. An important explanation of the findings is that QDS production experiences challenges that affect overall agricultural production. That is, for QDS challenges to be addressed, the government and other development agencies need to employ a holistic approach that addresses all challenges in the agricultural sector.

In the same vein, the patriarchal culture allows men (Table 2.3) more control over land (41.0%) than the women (18.8%). Consensus made across all FGDS tallied with the findings. The findings support those by Quisumbing and Pandolfelli (2010) who found that men are given preference over women in controlling land. However, the study by Quisumbing and Pandolfelli (2010) was conducted in a different context. A unique contribution of this study is the identification of a number of reasons that block women from inheriting land in Kilombero context. First, there is a belief that land owned by a woman may be transferred to another man, if a husband dies. Second, a wife who divorces her husband may transfer her land to another man who marries her. The findings imply that interested women have less chances of producing QDS rice because of gender based

discrimination. Women need to own an additional farm for producing QDS. That is, QDS rice needs to be produced within an isolation distance of 4 metre away from the surrounding farms. This is done so as to avoid cross-pollination.

Table 2.3: Control over productive resources

Variables	Gender							
	Men		Women		Men & Women		None	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Control of land	89	40.8	41	18.8	67	30.7	21	9.6
Control of inputs	77	35.3	35	16.1	70	32.1	36	16.5
Control of credit	58	26.6	28	12.8	41	18.8	91	41.7
Control of agricultural training	72	33.0	35	16.1	48	22.0	63	28.9
Control of extension services	64	29.4	33	15.1	58	26.6	63	28.9
Control of technology	56	25.7	28	12.8	53	24.3	81	37.2
Control of hand hoe	68	31.2	49	22.5	89	40.8	12	5.5
Control of Ox plough	46	21.1	16	7.3	15	6.9	141	64.7
Control of backpack sprayer	78	35.8	23	10.6	47	21.6	70	32.1
Control of bicycle	82	37.6	28	12.8	61	28.0	47	21.6
Control of motorcycle	54	24.8	15	6.9	23	10.6	126	57.8
Control of vehicle	37	17.0	13	6.0	21	9.6	147	67.4
Control of tractor	40	18.3	15	6.9	19	8.7	144	66.1
Control of bank account	51	23.4	19	8.7	34	15.6	114	52.3

Key: n=218

Similarly, the findings with key informant interviews reveal that women in the society are not given opportunity to control land within their family; one female key informant summarizes the views of other key informants as quoted below:

> *"I cannot produce QDS rice. QDS production requires a large land area. It is extremely difficult for women to own such land. Besides, I cannot take land from my neighbours to grow QDS* (A female Key informant, at Kisawasawa Village, Kilombero District, Morogoro 20/10/2019).

All FGDs arrived at a similar consensus. It was detailed during the FGDs on how some women experience socially imposed barriers to produce QDS rice because of lack of land. One explanation of the findings is that, land is an important asset for human's survival. It is a major source of income and livelihoods for most rural people as it is for urban dwellers. The finding resonates well with past research conducted elsewhere (Barume, 2014; Loserian and Jeckoniah, 2018). Given its importance, access to and availability of land resources is critical to ensure real and long-lasting improvements in social, economic and political well-being. The ownership and utilization of land as a productive resource for QDS rice production and as an important asset, directly define wellbeing among the farmers in the community. Table 2.3 reveals that men have more control over inputs (35%) than women (16.1%). At the same time women are the chief producers in agriculture production.

2.7 **Access to and Control over Agricultural Training, Extension Services and Technology**

Agricultural training, extension services, and technology can play a crucial role in boosting production, and utilization of QDS. Nevertheless, gender mainstreaming has to be incorporated to ensure fair access to such resources by both sexes. Overall, the findings of the study indicate that a higher percent of men (29.4%) had access to agricultural training compared to women (17.0%). A similar trend was observed for access to extension services as well as access to and control over technology (Table 2). Some related studies have shown a similar trend (Quisumbing *et al*., 2014; Simiyu and Foeken, 2014; Lamontagne-Godwin *et al.,* 2017; Mudege *et al.,* 2017). Mudege *et al.* (2017) is of the opinion that women are often times at a disadvantage position with regard to accessing agricultural training, extension services, and modern technology.

Agricultural extensions services are meant to assist farmers adopt enhanced practices leading to increasing production and ensuing well-being. It has been generally accepted that extension services are more available to men than women farmers. However, in Kilombero, NGOs (e.g. USAID-Feed the Future) and Government Institutions such as TOSCI, which help farmers with the knowledge and extension services are of the opinion that women should be included in such interventions to allow them access aid such as seed for QDS training and extension service.

FAO (2011) observed that service providers tend to approach men more often than women because of the general misperception that women do not farm. It is evident that women do not have the power to decide at the house hold level; men have to decide on their behalf. That is why men have the power to decide to attend trainings on behalf of women. In addition, there are some expectations that there would be a “trickle down” effect from men as heads of household to the rest of the household members. Information from key informants and FGDs also reported that men normally represent their wives in accessing agricultural training, extension services and modern technology. These results reveal that women are often at a disadvantage position with regard to accessing agricultural training, extension services and modern technology. Women are the main contributors to agriculture production leading to increased food security and income in the community. If women do not have access to agricultural training, extension services and modern technology, agricultural productivity is likely to decrease.

In case of bank accounts, men also dominate in access (15.6%) and in control (23.4%) over bank accounts (Table 2.2 and Table 2.3). During interviews, one of the key informants remarked that women in the society are not given much opportunity to control

assets within the society and their family because of religion. This is shown in the quote of one of the key informants below:

> *"In our religion (Muslim), women must be behind men and not in front of men in everything" (A male key informant at Kiberege Village, Kilombero District, Morogoro 4/10/2019).*

Overall, the study revealed that socially constructed roles, stereotypes in production and utilization of QDS favour men to the disadvantage of women. The findings imply that gender mainstreaming is an essential ingredient for successful interventions in rice QDS utilization and production.

2.8 **Conclusions and Recommendations**

The study has revealed that women get less benefits in QDS rice production due to poor access to and control over productive resources, which are largely brought about by cultural barriers that exist in many societies. To achieve increased production in rice QDS, there is a need to get rid of cultural barriers, to integrate gender at all levels and create awareness for both men and women. Introduction of gender sensitive programmes will allow not only equality in use, but also sustainable utilization of rice QDS resources. An important contribution of the study is that QDS cannot be isolated from the rest of the challenges facing the agricultural sector. That is, there is a need for a holistic approach that addresses challenges in the agricultural sector including gender-based oppression. Isolated efforts are unlikely to be fruitful. Further, the findings reported in this paper support the GAD theory. That is, socially constructed roles indeed affect not only women but the entire community. There is a need for Local Goverment Authority to ensure gender equality to facilitate production and utilization of rice QDS.

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CHAPTER THREE

3.0 **Attitude of rice farmers towards Rice Quality Declared Seed (QDS) in Kilombero District, Morogoro Tanzania**

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Abstract

This paper examined attitude of rice farmers towards rice QDS production in Kilombero District as a study area. A cross-sectional research design was used during data collection. Quantitative data were collected through administering a questionnaire to 218 respondents engaged in rice production. Moreover, qualitative data were also collected through focus group discussions and key informant interviews to complement quantitative data and allow triangulation of the data. Descriptive statistics were analysed using SPSS, while qualitative data were analysed using content analysis. Attitude was measured through use of 15 statements regarding attitude of respondents towards rice QDS following a five-point Likert scale. The results showed that the majority of farmers had positive attitude towards rice QDS production because rice QDS gives more yield than local seed varieties. High technology cost in using rice QDS was found to be one of the barriers to many farmers to produce and use rice QDS. The study therefore concludes that there is a viable opportunity to enhance farmers' to produce and use of rice QDS in the study area through appropriate information dissemination and provision of support and training needed by the farmers to maximize their produce and use of rice QDS. To achieve increased production in QDS rice, the government and other non-governmental actors should create mechanisms of providing subsidy to improve access to rice QDS. The mentioned actors should, among other things, offer credit to producers to increase rice QDS production.

Keywords: Attitude, recycled seed, quality declared seed, improved seed men and women farmers.

3.1 **Introduction**

Attitude refers to a tendency of an individual exposed through varying degrees of favourable or unfavourable judgments (Sivaraj *et al*., 2017). Attitudes enable an

individual to describe how he/she sees a situation, as well as define how he/she acts towards the situation or object. Attitude includes feelings, thoughts, and actions. Attitude may simply be an enduring evaluation of a person or object (Fakhi, 2015). It is advisable to apply attitudinal approach when researching on attitude of men and women towards rice Quality Declared Seed (QDS) in order to avoid asymmetric information to occur and to improve rice production. That means, attitude is an important aspect that can be used to understand and predict people's hidden reaction to an object or change.

The QDS programme in Tanzania was introduced for the first time by FAO in the early 2000s to make it possible for production and utilization of quality seeds by rural farmers who were not reached by formal seed companies (TOAM, 2015). QDS refers to a form of quality assurance system that was formulated to reduce the burden of rigorous conventional seed certification processes, while retaining the basic characteristics of external quality assurance, and thereby increasing access to quality seed for smallholder farmers. Quality seed is defined as varietal pure with a high germination percentage, free from pest and disease organisms, and with a proper moisture content and weight (Granqvist, 2006). Quality declared seed (QDS) systems are a vehicle through which farmers get good quality seeds of the new crop varieties they want and need (Pan-Africa Bean Research Alliance -PABRA, 2017). In addition, having access to good quality seeds could ensure higher productivity up to 40% increase (Abebe and Alemu, 2017).

Mligo and Msuya (2015) informed that the supply of quality seeds for many years through formal seed system has not been satisfactory. The majority (90%) of smallholder farmers continue to use recycled seeds (Sekiya *et al*., 2020). This reveals that seeds produced by formal seed companies are not adequate and do not satisfy the requirements. They are also so expensive that small-scale farmers cannot afford to buy them. Similarly, production

and sale of certified seeds by the formal sector (both public and private) has not satisfactorily met the national seed demand, which is estimated at 212 274 MT per year (NBS, 2014). QDS have been introduced to address the challenge.

QDS, therefore, offers an opportunity to Tanzanian smallholder farmers to produce quality seeds which are easily available at affordable price to other farmers. Production of QDS is a good way to minimize existing gap and to improve the seed trade and food production in Tanzania (FAO, 2010). An analysis of the quantity of seeds planted in the 2016/2017 season reveals that the contribution of QDS to overall seed basket in Tanzania is very low (Makingi and Urasa, 2017; TOSCI, 2018).

Efforts have been made by different institutions to ensure seed systems are developed in order to improve acceptance of quality seed varieties by smallholder farmers. The efforts include the Ministry of Agriculture through the Agricultural Sector Development Programme (ASDP II), a national key document, which emphasizes on increasing agricultural productivity, profitability and farm incomes (URT, 2016). Researchers like Massawe *et al.* (2020), Sekiya *et al.* (2020) and Monela (2014) have studied the use of improved rice seeds by smallholder farmers in rice producing areas. Improved seeds increase yield five times compared to recycled seeds. However, little has been documented on the attitude of rice farmers towards rice QDS. This paper answers the question that what is the attitude of men and women towards rice QDS.

The findings in this paper are in line with various national and international policies and programmes that focus on different aspects of agriculture. The paper also is in line with Sustainable Development Goal Number Two (SDG Number 2). This goal emphasizes on ending hunger, achieve food security, improve nutrition and promote sustainable

agriculture (FAO, 2015). Further, the findings contribute to SDG Goal Number 5 that aims at achieving gender equality and empower women. The study on which this paper is based is in concordance with the objectives of Agricultural Sector Development Programme (ASDP II), a national key document, which emphasizes on increasing agricultural productivity, profitability and farm incomes (URT, 2016). Moreover, the paper is also in line with National Rice Development Strategy (NRDS), which focuses on food security and achieving self-sufficiency in staple food production (URT, 2013). Knowing attitude of men and women towards QDS production would enhance QDS development. This paper, therefore, examined rice farmers' attitude towards QDS in Kilombero District, Morogoro, Tanzania. The research findings contribute to the Third Five Year Development Plan (FYDP III) by empowering QDS smallholder farmers to apply knowledge in new or different ways compared to current practices. This paper also bridges the aforementioned gap and informs interventions which may be put in place being tailored to the needs of smallholder farmers with a view of improving involvement of men and women in QDS growth. The paper also highlights areas for boosting QDS among smallholder farmers in Kilombero District.

Further, awareness of farmers on the entire system of QDS rice production in Kilombero District will be enhanced. Moreover, the findings are important to agricultural planners, policy makers and implementers towards improving smallholder farmers' lives through increased access to quality seeds in decision-making and resource control for the betterment of all family members. Furthermore, the study contributes to the general body of knowledge as secondary data (reference) for future studies in agriculture.

The theory of reasoned action was applied to this paper. The theory was proposed by Ajzen and Fishbein (1980) on the assumption that human beings are usually quite rational and make systematic use of the information available to make decisions before they

decide to take any action. The theory states that an attitude is a function of beliefs. Therefore, a person who believes that he/she can perform a given action has a positive attitude towards the action. Meanwhile, a person who does not believe that he/she can perform something is likely to end up having a negative attitude towards the action. The theory is useful because it lays a strong ground for farmers to develop attitude towards rice QDS.

3.2 **Methodology**

The study on which this paper is based was conducted in Kisawasawa, Mang'ula and Nkula Wards in Kilombero District, Tanzania (Figure 3.1). The rationale for choosing Kilombero District was: (i) Presence of farmers registered for QDS rice production (TOSCI, 2018) and (ii) The district being one of major rice production and supply districts in Tanzania (Mligo and Msuya, 2015). The population for this study consisted of all rice farmers (also referred to as rice producers) of Kisawasawa, Mang'ula and Nkula Wards in Kilombero District Council with some access to QDS. The study employed cross-sectional research design whereby data were collected at a single point of time.

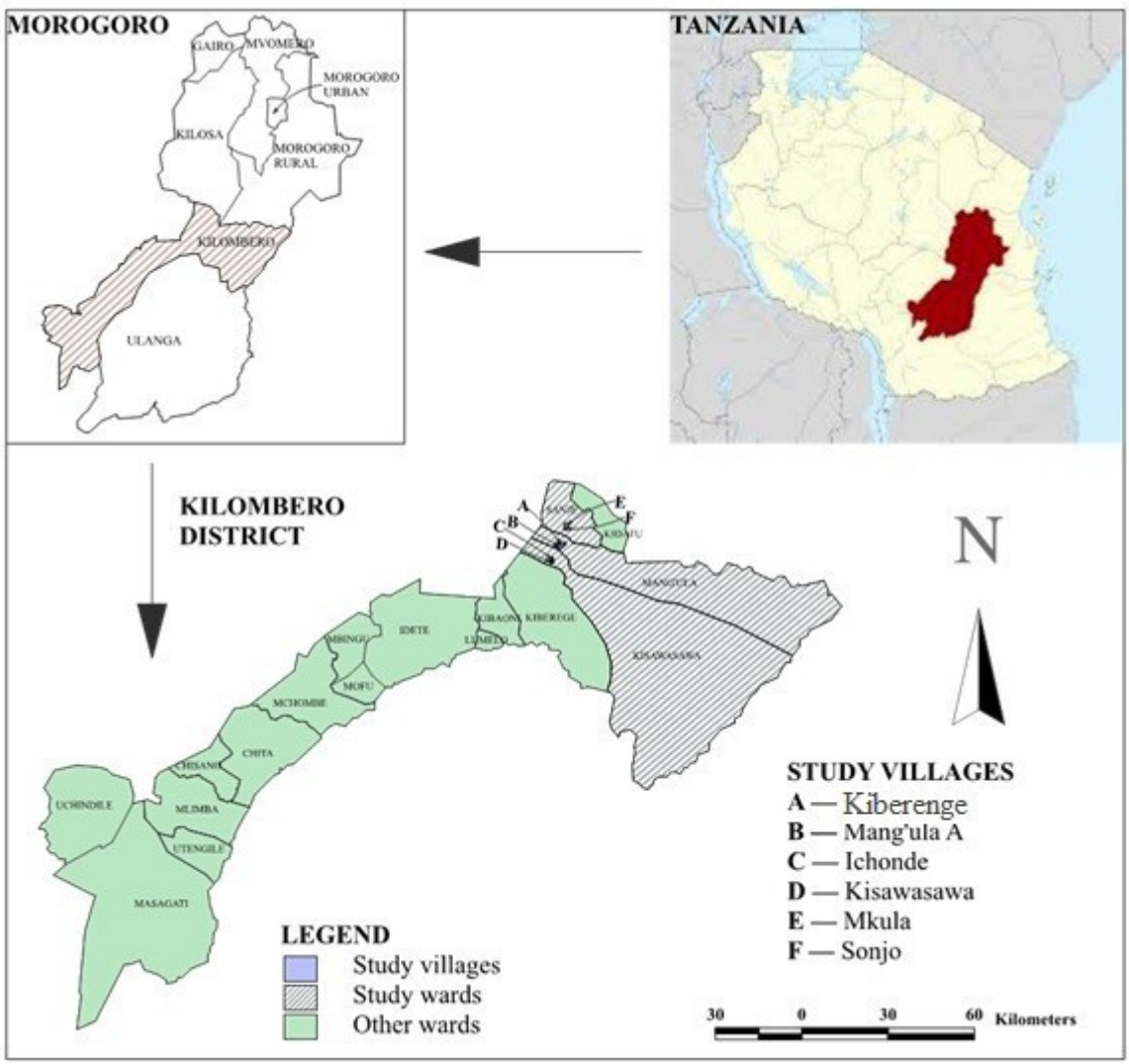

Figure 3.1: Map of study area in Morogoro region

The unit of analysis was an individual farmer producing and utilizing QDS. .These involve farmers who at same point in their life participated in QDS production, individual or in a group. A representative sample was drawn from all rice farmers who were producing and utilizing QDS. The sample size was determined by using Yamane (1967)'s formula. Simple random sampling procedure was used to select a representative sample of rice producers. A sample of 389 smallholder rice farmers was randomly chosen. To ensure that the number of sampled smallholder farmers in a particular village was proportional to its total number of farmers, proportionate stratified random sampling was applied. However, a sample of 218 was available during the survey for interview.

Both primary and secondary data were collected for the study. Primary data were mainly collected by using quantitative and qualitative methods. A semi-structured interview guide was employed to collect qualitative and some descriptive data. A structured questionnaire comprising closed, and open-ended questions was designed to solicit information from respondents.

Data entry and cleaning were done after data collection. Quantitative data were analysed using Statistical Product and Service Solutions (SPSS) version 20. Specifically, SPSS was used to generate descriptive statistics including percentages. Qualitative data were analysed using content analysis. All of the data were presented in line with the study objectives.

A Likert scale was employed to assess the attitude of men and women towards QDS. Frequencies and percentages were used to gauge the general attitude of farmers towards QDS rice whereby 15 statements (with positive and negative connotation) were formulated for measuring attitude of men and women. To achieve this, a 5-point Likert type scale was used. The 5 scores were assigned values as follows: strongly agree which was assigned the value of 5, Agree which was assigned the value of 4, Undecided which was assigned the value of 3, disagree which was assigned the value of 2 and strongly disagree which was assigned the value of 1. Frequencies and percentages were used to gauge the general attitude of farmers. In case of negative attitudinal statements, reverse score was assigned to each response. Then responses were grouped into three categories: strongly disagree and disagree into disagree; strongly agree and agree into agree while neutral (3) were left to stand-alone.

3.3 **Results and Discussion**

Socio-demographic characteristics of the respondents

The results in Table 3.1 show that the maximum age of the respondents was 61 years while the minimum age was 18 years. A good proportion (68.8%) of the respondents fell within the age group 25-54 years, meaning that the majority of the respondents were within the economically active age group to fully engage in agricultural activities. Similar results were reported by Ngailo *et al*. (2016) and Fakir (2017) whose studies focused on rice farming in the Southern highlands of Tanzania. They found out that 25- 54 years is active age to fully engage in agricultural activities. Mutanyagwa *et al*. (2018) maintain that farmers in their productive age dominate smallholder maize production in Tanzania. The results also showed more than half (51.4%) of the respondents were male farmers. This shows that the proportion of male was slightly higher than that of women in the QDS rice sub-sector.

Concerning education level, the majority (95%) of the respondents were found to have some literacy with qualifications ranging from primary education to college/tertiary level, while only 5.0% of the respondents had no formal education. Education level is used to measure the ability of a person to utilize the available information to increase production. It also influences major decisions being taken in the household and farm management (Thabit, 2014).

Table 3.1: Socio-demographic characteristics

Characteristics	Frequency	Percent
Age of respondents		
18-24	21	9.6
25-34	44	20.2
35-44	61	28.0
45-54	45	20.6
55-60	34	15.6
61 and above	13	6.0
Sex of respondents		
Male	112	51.4
Female	106	48.6
Education level of respondent		
No formal education	11	5.0
Primary education	170	78.0
Secondary education	34	15.6
College education	2	0.9
Graduate and above	1	0.5
Marital status		
Married	157	72.0
Single	32	14.7
Divorced	2	0.9
Widow/Widower	12	5.5
Separated	10	4.6
Cohabit	5	2.3

A literate society is better in understanding and competent in performing different activities including QDS rice production. Thus, education level is one of the basic measures which can be used to decide the status of the society. The study's observations generally conform to findings by Jeckoniah (2018) that farmers who are better educated are generally more open to innovative ideas and new technologies that promote technical change.

Low education makes it difficult for marginalized rice producing farmers to gain access to and use some of the other resources, such as land, improved seeds, credit and fertilizers

(Madaha, 2012, 2018). Less education also prevents marginalized rice producing farmers from adopting new technologies as readily as men do (Fakih, 2015; Kulyakwave1 *et al*., 2019). Equally, marginalized rice farmers have inadequate skills and knowledge, due to discriminatory access to productive sources (Madaha, 2018). These findings are also supported by Kulyakwave1 *et al*. (2019), who pointed out that adequate education could help farmers in technology acceptance and accessing extension services.

According to scholars (Ngailo *et al*., 2016; Mango, 2018; Kulyakwavel *et al*., 2019; Otekhile, 2019), marital status of farmers has significant influence on rice yield. In this study, the majority (72%) of the respondents were married, while 28% were divorced, single, widowed (widows and widowers), separated/divorced and cohabiting. These results suggest that the society is matrimonially stable. The findings also imply in the study area, which experiences stable marriages rice yield is expected to be high.

3.4 **Attitudes of Rice Farmers towards Rice QDS**

Attitude of farmers towards rice QDS was measured by using a Likert scale. The scale has been found to be an effective technique for measuring attitudes (Likert, 1932). The study used a 5-points Likert scale (1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree and 5 = strongly disagree). Responses from 15 statements which were used in the Likert scale were combined to create a measurement of an Attitudinal Scale (AS). AS is a single variable used to represent cumulative attitude (Likert, 1932).

Statements favourable to the construct were positively worded while unfavourable statements were negatively connotated. Then numerical values for the response options were reversed for the statements that had negative connotation when calculating the overall score. The higher values indicated positive attitude disposition of favourable

attitude towards rice QDS, implying that the respondents were supporting adoption and use of rice QDS while low values indicated negative attitude (i.e., unfavourable response) rice QDS.

The attitude of farmers towards rice QDS was evaluated by using various statements which are presented in Table 3.2. Although there are several traits that farmers look for when making decision on the selection of quality seeds such as, yield, taste and storability, the study noted that 88.4% respondents thought that yields are important when one decides to engage in rice QDS because it gives high yield. From the findings, it was agreed further that rice QDS produce 7-8 tonnes per ha, which is four times more than local seed varieties (Katrin, 2013). Thus, for farmers to increase their productivity and get profit, they should opt to grow rice QDS. Rice QDS give aroma and taste half way compared to local variety. A high yielding variety promises high return to farmers with regard to what they had invested in the production process (Obaa *et al*., 2005). The reasoned action theory supports the decision on either to continue or discontinue using a particular seed variety. This implies that when a farmer believes in success of a particular variety, he/she will have positive attitudinal behaviour to continue using that variety. These findings were further substantiated by evidence from one of the key informant interviewees as narrated in the following quote:

> *"...We know QDS have higher yields than recycled seeds, but one has to work a lot in the field than with recycled seeds. For example, during planting QDS rice one has to prepare a nursery and sow seeds. This is followed by transplanting of seedlings in the main field. But this is not the case for recycled seeds, where one broadcasts seeds and off, he/she goes."* (A key informant at Nkula Village, Kilombero District, Morogoro 4 November, 2019)

Table 3.2: Statement of attitudes of farmers towards QDS rice production

Statement	Agree n (%)	Neutral n (%)	Disagree n (%)
I choose QDS because it gives high yield	192(88.4)	22(19.1)	4(1.8)
Local variety have aroma, taste and strong grain quality than QDS	146(67)	15 (6.9)	57(26.2)
QDS mature early than Local variety	153(70.2)	4 (1.8)	61(28)
Price is not a limiting factor for me to use QDS	165(75.7)	9 (4.1)	44(20.2)
Information about QDS is readily available in our village	171(78.4)	34(15.6)	13(5.9)
QDS are available in agro-input stockiest shop in our village	162(74.3)	9 (4.1)	47(21.5)
Smallholder farmers adopt QDS because of their value markets	179(82.4)	6 (2.8)	32(14.7)
QDS reach smallholder farmers in time	167(76.6)	13 (6.0)	38(17.4)
QDS present too complex task to implement in the farm	125(57.4)	11 (5.0)	82(37.6)
QDS present inferior in terms of yield than local variety	185(84.8)	9 (4.1)	24(11)
QDS need higher technologies compared to local seed varieties	148(67.9)	30 (13.8)	40(18.3)
QDS produce are more marketable than Local varieties	64(29.3)	11 (5.0)	143(66.5)
I do not have the knowledge needed to use a QDS	145(66.5)	5 (2.3)	68(31.2)
Credit will enable me to buy QDS	187(85.4)	1 (0.5)	30(13.8)
It is expensive to use the QDS	146(67)	12 (5.5)	60(27.5)

Positive attitude of the respondents towards rice QDS was also reflected on maturity of the seed. Majority (70.2%) of respondents were of the opinion that; “rice QDS mature early than local seed varieties”. Early maturing seed varieties reduce numbers of days in the field; hence, reduce expenses and increase income to small scale farmers. This implies that, rice QDS variety is embedded with early maturing attributes that reduce numbers of

days in the field. According to Tshikala *et al.* (2015), farmers' decision to maximize their production in a season is influenced by the results realized or obtained earlier.

It was also established, as shown in Table 3.2, price is not a limiting factor when choosing to grow rice QDS. This is confirmed by more than three-quarters (75.7 %) of the respondents who agreed with the statement. Further, majority (84.5%) of farmers agreed that access to credit would enable them to buy rice QDS. This means that rice QDS is important to the life of farmers in Kilombero District. However, the available evidence indicates that the overall participation of farmers in rice QDS production is very low. Farmers reported that they were not able to get credit to buy rice QDS even though they knew that improved seed has a trait of producing more than local seed varieties. Again, this shows positive attitude towards rice QDS production as elaborated in the theory of reasoned action. In respect to the theory of reasoned action (TRA), farmers make assumptions on deciding to increase or decrease the rice production by observing increase in production of each season.

It was also noted that farmers prefer seed varieties with good taste, aroma and grain quality but also the output of the produce. Table 3.3, indicate that out of all the respondents, more than half (67%) of the respondents agreed to the statement that taste, aroma and grain quality are more important when choosing rice QDS. It was further revealed that because of rice QDS different taste and aroma, many of the farmers who grow rice QDS are forced to have a separate plot for growing local rice variety. Farmers argue that local rice varieties have taste and aroma which are stronger and more acceptable to them than the taste and aroma of the improved variety. For instance, it was remarked by a woman farmer, during key informant interviews, that local rice varieties strengthen their marital relations. This was beefed up with the following quote:

> *"...Tule na bwana, which literare mean (Eat with husband) variety strengthens husband and wife relations because of its good taste and aroma...."* (A female participant, QDS producer at Nkula Village, Kilombero District, Morogoro 7/10/2019).

The variety *Tule na bwana* "wives eat together with their husband", is believed to improve and one the reasons of stable marital relations in the study area because of its delicious taste and sexy aroma. However, the truth remains the same that improved rice variety produces more yield than local rice varieties. High producing rice varieties ensure food security in the country. The study is in line with Kadigi *et al*. (2020) who uphold that improved rice variety promotes food security and eradication of poverty, thus urge for and encouraging the use improved rice variety in the country for better yield.

Furthermore, it was learnt from the interview that apart from aroma and taste, farmers prefer local rice varieties because their grains do not break easily and they are not expensive. It was reported that the grains of local rice varieties are harder than those of QDS when processing. It was also noted that even rice processors prefer local rice varieties because the grain is hard and not easily broken. This stand was strongly supported by one of the key informants as he said:

> *"...I prefer local rice varieties because their grains are harder. They do not break easily when processing. The unbroken rice is preferred by business people as they fetch higher price in the market compared to QDS produce..."*, (A male rice processor, at Mang'ula A Village, Kilombero District, Morogoro, 22/10/2019).

Similarly, cost related with rice QDS was identified to affect farmers' attitude as most (67%) of the farmers admitted that it is expensive to use the rice QDS.

Although this quote seems to support local rice varieties over rice QDS, still the harvest from rice QDS gives higher output than harvests from local rice varieties. For example, one acre of rice QDS produces 20 to 30 bags each of 100 kg while one acre of local rice variety produces 3 to 5 bags. The difference based on equal treatments of crop husbandry. Therefore, those who grow rice QDS get higher income compared to those who grow local rice varieties. This stand was beefed up by the following quote:

> "*... Although local variety rice fetches higher price than rice QDS but for one acre of rice QDS I can harvest more than local variety and get increased income 4 to 5 times after selling the produce...*", (rice QDS farmer at Ichonde village, Kilombero District, Morogoro, 7/10/2019).

The study further noted that the attitude is also impelled with technological skills needed for handling and using rice QDS. It was established that improved rice variety needs improved technology than local rice variety. This lowers farmers attitude toward rice QDS as the majority (66.5%) of the respondents admitted that the rice QDS variety needs modern technologies in production and yet farmer claimed not to have the knowledge needed to use rice QDS. FGD participants also revealed where it was reported that planting seeds of local rice variety is easy; it needs broadcasting. The broadcasting method allows farmer to throw seeds in the farm randomly. This is not for rice QDS where by planting needs nursery preparation and sowing seeds first, then transplanting in rows or planting seeds in rows. Rice QDS require timely ploughing, sowing, planting, transplanting, weeding, harvesting and storage; otherwise, loss of produce will be half of the output. This observation is supported by Tshikala *et al.* (2015) who reported that farmers who are satisfied with higher yields got much technological information from extension workers and rice QDS reach them in time. Similarly, Tura *et al.* (2010) hold that access to extension services by farmers increases the extent of production in terms of

yield. Although Nchembi (2017) disagrees with these findings, during the focus group discussion participants confirmed that access to extension services contributes new agricultural practices and technology to their production.

It was moreover established in this study that although consumers prefer local rice varieties because of their taste, aroma and grain quality, consumers are forced to buy rice QDS as it is the only variety available in large quantities in the market. This availability is the result of rice QDS ability to produce higher quantity from one acre which is 20 to 30 bags each of 100 kg as opposed to local rice varieties that produce 4 bags to 5 bags each of 100 kg per acre.

Another attitudinal statement was on the high rate of use of improved rice seeds among smallholder farmers attributed to availability of agro-input dealers in farmers' areas. It was noted that the majority (74.3%) of the respondents are informed about improved varieties as they get information and seeds from agro-input dealers. Similarly, the study found that about three- quarters (78.4%) of the respondents were aware and informed about rice QDS being readily available in their villages. The percentage of women in the study area who received information on availability of the rice QDS was slightly lower than that of men. This implied that women were less considered to receive first-hand information about agricultural inputs, while they are the main producers of the crop (Madaha, 2018).

The study solicited further if information about rice QDS reaches smallholder farmers in time. It was noted that the majority (76.6 %) get information about the improved verities on time. Thus, it obvious that availability of rice QDS rice and their information in the

study area is not a problem and rice QDS are available in time, but the number of farmers growing rice QDS is still low (Table 3.2).

3.5 **Conclusions and Recommendations**

Based on the study findings, the following conclusions are made. Farmers had positive attitude towards QDS with the main reason that QDS rice gives more yield and matures early as compared to local rice varieties. This reduces the numbers of days and burden of attendending crop in the field for a long time. The study noted further that respondents consider QDS rice production as an expensive undertaking as it needs improved technology and time during planting to harvesting period.

The study recommends that QDS stakeholders including Kilombero District Council, private sector and development partners' to intervene by assisting farmers get access to financial assistance. The intervention will increase farmers' access to credit thus increase production of rice using QDS. Local government authorities should take deliberate measures to assist, encourage and educate farmers on QDS production. This will boost the number of QDS producers, users as well as their farm sizes. QDS rice could be the best option that could maximize farmers' production, profit and income if farmers are encouraged to produce QDS rice in a business manner. Therefore, farmers have to be assisted, educated and encouraged to engage in QDS rice production so as to increase their income and yield. Similarly, the government should look into the possibilities of subsidizing agricultural inputs including improved seed such as a QDS, and fertilizers for increased outcome.

A unique finding of the study is that, farmers' positive attitude towards QDS is not sufficient in absence of enough capital. Thus, for QDS production to be efficient and effective; there is a need to make sure that rice producing communities have enough capital.

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CHAPTER FOUR

4.0 Gender Roles of Men and Women in Rice Quality Declared Seed (QDS) in Kilombero District, Morogoro Tanzania

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Abstract

Gender roles and responsibilities in rice QDS have an impact on agricultural functioning. Gender inequalities resulting from unequal division of role can prevent the efficiency of the sector. Using Kilombero District as a study area, this paper assessed gendered roles of rice farmers in the production and utilization of rice QDS. A cross-sectional research design was used during data collection. Quantitative data were collected through administering a questionnaire to 218 respondents. Moreover, qualitative data were collected through Focus Group Discussions and key informant interviews to complement quantitative data and allow triangulation of the data. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) while qualitative data were analysed using content analysis. It was found that women play a major role in rice QDS. Men are predominantly engaged in land preparation, fertilizer application, pest management, packing, labelling, grading and storage while other farming activities were carried out by women. It is concluded that unequal gender roles exist between men and women in the study area. The study urges for introduction of gender sensitivity and awareness programmes at the family level to ensure that gender roles in rice QDS become fair.

Keywords: gender, role, quality declared seed, improved rice, productivity.

4.1 **Background**

Gender roles and responsibilities in rice QDS have an impact on agricultural productivity, but gender inequalities can prevent its efficiency. The Quality Declared Seed (QDS) programme in Tanzania was introduced by FAO in the early 2000s to make it possible for production and utilization of quality seeds by rural farmers in remote areas who were not reached by the formal seed companies. QDS refers to a form of quality assurance that was created to reduce the burden of rigorous conventional seed certification, while retaining the basic characteristics of external quality assurance, and thereby increasing access to quality seed for smallholder farmers. The main goal of the programme was to improve availability of improved seeds, and hence increase the use of QDS among smallholder farmers for increased agricultural productivity. QDS are quality seeds produced by small-scale farmers who are trained by Tanzania Official Seed Certification Institute (TOSCI) (2018) under supervision of Seed Inspectors working for Local Government Authorities (LGAs).

The knowledge and responsibilities embodied in various activities of rice QDS are often gender-specific, and this aspect has to be taken into account during production. Men and women control different assets and have different decision-making roles and responsibilities, generally resulting in an unequal situation that is disadvantageous to women (Ngaga, 2019). According to Ngaga (2019), agricultural production strategies have to take into account these inequalities in needs, capacities and access to knowledge, resources and livelihoods to ensure that women are fully included in making decisions, and they control assets in agricultural interventions.

Gender roles influence the division of labour because labour is valued differently depending on who does it. Seleman (2017) found that, as a result of women’s low status

in the community, the activities performed by women in agriculture are less appreciated than men's and in turn their low status is continued through the low value placed on their activities. Different roles, works and values of labour create differential access to decision-making, services and benefits. Certain kinds of work have been stereotyped as being 'male "or "female", because of the socialization process on the division of labour which stipulates different roles for men and women (Deere, 2005; Madaha, 2018).

Gender refers to socially constructed roles and status of men and women, and is a set of culturally specific characteristics defining the social behaviour of men and women and the relationships between them (Madaha, 2018). Gender roles assigned to men and women have an impact on their respective access to resources and the power to decide over the benefits of using those resources. Different roles are perfomed by women in rice QDS farm management includes; sowing seed in the nursery, transplanting to the main field followed by weeding two to three times in the season, fertilizers application, harvest to storage. This roles are different from normal rice production where by, sowing seed not need nursery preparation or transplanting activities, farmers are normally use broadcating method,weeding can be done once,fertilizers and pesticide can be applied or not followed by harvesting and storage. These roles are performed by women but their burder is not heavy compared to rice QDS production. Gender has an impact on women and men's differentiated roles and participation in agriculture and their respective control over decisions that affect the management of the chain as well as the use of benefits generated by the activity. Thus, this paper was carried out specifically to examine gender roles in rice QDS.

Efforts have been made by different governmental and non-governmental institutions to ensure development of systems in order to improve use of quality seed varieties used by

smallholder farmers. For example, the Ministry of Agriculture and other programmes such as Programme for Africa's Seeds Systems (PASS) and *Kilimo Kwanza* (Agriculture First) were actively involved in participatory extension of improved rice technologies. Scholars like Massawe *et al.* (2020), Monela (2014) and Sekiya *et al.* (2020) studied the use of improved rice seeds by smallholder farmers in rice producing areas and found that improved seeds increase yield five times compared to recycled seeds. However, little has been documented on the gender roles of men and women towards rice QDS. Knowledge on gender roles of men and women towards rice QDS would enhance rice QDS development. This paper, therefore, evaluate gender roles of men and women towards rice QDS production in Kilombero District, Morogoro, Tanzania. The research findings will contribute to the third Five-Year Development Plan (FYDP III) by empowering rice QDS smallholder farmers to apply knowledge and become rice QDS producers. This paper also bridges the aforementioned gap and comes up with interventions that will be tailored to the needs of smallholder farmers with a view of improving involvement of men and women in QDS development. It also highlights areas for boosting rice QDS among smallholder farmers in Kilombero District.

The paper is in line with various national and international policies and programmes that focus on different aspects of agricultural improvement. The paper also is in line with Sustainable Development (SDG) Goal Number 2. This goal emphasizes on ending hunger, achieve food security, improve nutrition and promote sustainable agriculture (FAO, 2015). The findings contribute to SDG Goal Number 5 that aims at achieving gender equality and empower women and girls. Further, this paper is in concordance with the objectives of the Second Agricultural Sector Development Programme (ASDP II), a national key document, which emphasizes on increasing agricultural productivity, profitability and farm incomes (URT, 2016). Further, the paper is in line with the National

Rice Development Strategy (NRDS), which focuses on food security and achieving self-sufficiency in staple food production (URT, 2013).

Moreover, awareness and enhancement of farmers in the entire system of rice QDS in Kilombero District is the main focus of the study. The findings are important to agriculture planners, policy makers and implementers towards improving smallholder farmers' lives through increased access to quality seeds and equality in decision-making and resource control for the betterment of all family members. Furthermore, the study contributes to the general body of knowledge as secondary data (reference) for future studies in agriculture.

4.2 **Theoretical Framework**

This paper is guided by the Social Relations Framework developed by Kabeer (2003) and then expands on the framework to analyse existing gender inequalities and opportunities in the distribution of resources, responsibilities, and power across rice QDS farmers in Kilombero District. The major focus of this framework is on the social relations between women and men and their relationships to resources and activities for the purpose of increasing human-wellbeing. Human well-being is seen as concerning survival, security, and autonomy, where autonomy means the ability to participate fully in decisions that shape one's choices and one's life chances, at both personal and collective level (Madaha, 2018).

Different aspects of social relations shared by institutions and the relationships between socio-economic factors and gendered participation were analysed basing on the framework to understand how gender inequalities influence rules (how things get done), resources (what is used and what is produced), people (who is in and who is out),

activities (what is done) and power (who decides and whose interests are served) embedded in rice QDS.

4.3 **Methodology**

The study on which this paper is based was conducted in Kisawasawa, Mang'ula and Nkula Wards in Kilombero District, Tanzania (Figure 4.1). The rationale for choosing Kilombero District was: (i) Presence of farmers registered for rice QDS production (TOSCI, 2018) and (ii) The district being one of major rice production and supply districts in Tanzania (Mligo and Msuya, 2015). The population for this study consisted of all rice farmers (also referred to as rice producers) of Kisawasawa, Mang'ula and Nkula Wards in Kilombero District Council with some access to rice QDS. The study employed cross-sectional research design whereby data were collected at a single point of time.

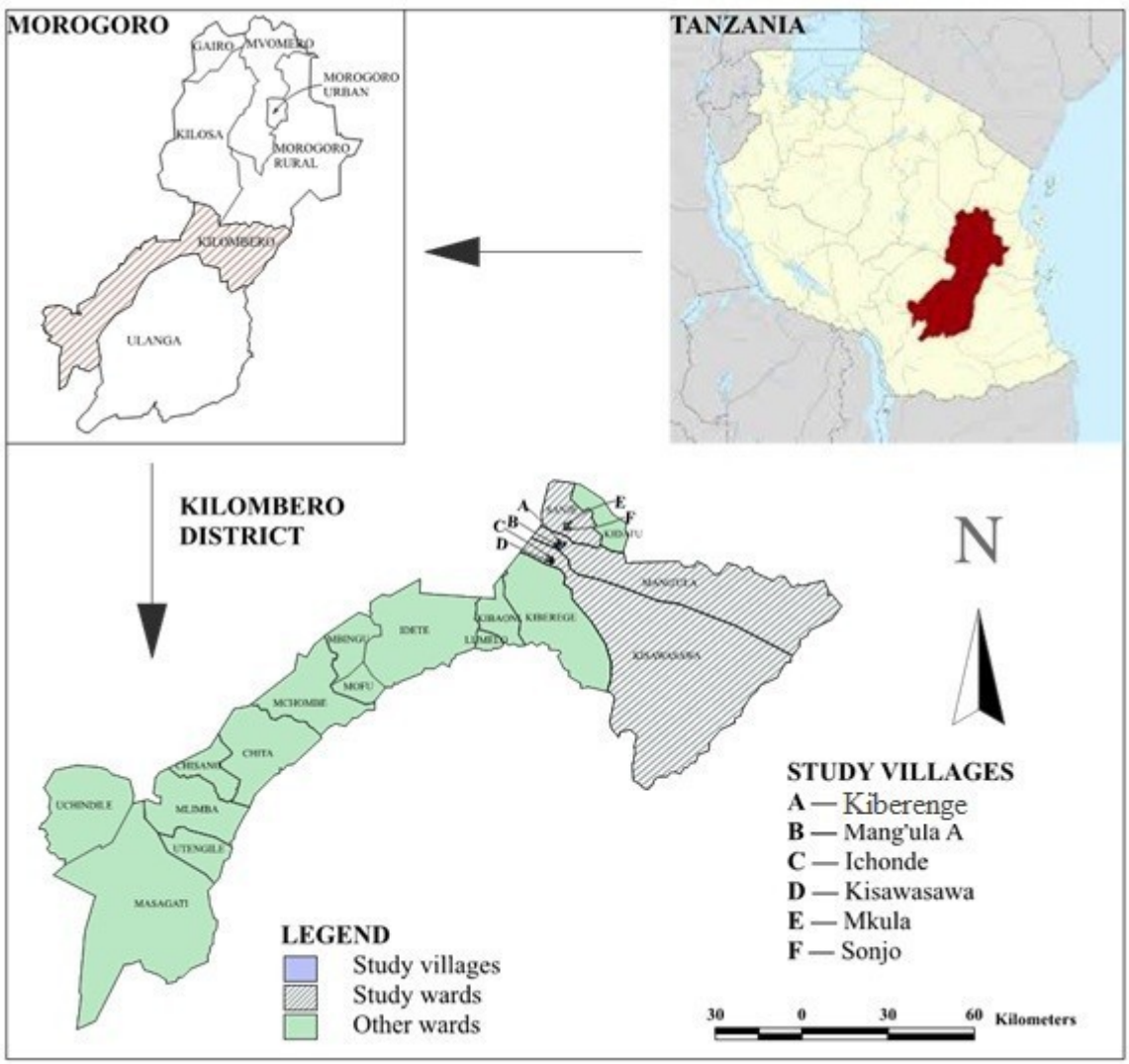

Figure 4.1: **Map of study the area in Morogoro Region**

The unit of analysis was an individual farmer producing and utilizing rice QDS. These involve farmers who at same point in their life participated in QDS production, individual or in a group. A representative sample was drawn from all rice farmers who were producing or utilizing rice QDS. The sample size was determined by using Yamane (1967)'s formula. Simple random sampling procedure was used to select a representative sample of rice producers. A sample of 389 smallholder rice farmers was randomly chosen. To ensure that the number of sampled smallholder farmers in a particular village was proportional to its total number of farmers, proportionate stratified random sampling was applied. However, a sample of 218 was available during the survey for interview.

Both primary and secondary data were collected for the study. Primary data were mainly collected by using quantitative and qualitative methods. A semi-structured interview guide was employed to collect qualitative and some descriptive data. A structured questionnaire comprising closed, and open-ended questions was designed to solicit information from respondents. Harvard Analytical Framework (HAF) was used to guide collection of information related to gender role of women and men in rice QDS rice production.

Data entry and cleaning were done after data collection. Quantitative data were analysed using Statistical Product and Service Solutions (SPSS) version 20. Specifically, SPSS was used to generate descriptive statistics including percentages. Qualitative data were analysed using content analysis. All of the data were presented in line with the study objectives.

4.4 **Results and Discussion**

Although the study focused on gender roles of men and women in quality declared seed among rice farmers in Kilombero District, some demographic variables were also useful in explaining the gender dynamics among the rice producers. As illustrated in Table 4.1, the results show that the maximum age of the respondents was 61 years while the minimum age was 18 years. The majority (68.8%) of the respondents fell within the age group of 25 to 54 years. The findings imply that the majority of rice producers are young people and are within the economically active age category. Similar results were shared by Ngailo *et al*. (2016) and Fakir (2017) whose studies focused on rice farming in the Southern highlands of Tanzania. Also, Mutanyagwa *et al*. (2018) in their study found that farmers in their productive age dominate smallholder crop production in Tanzania. The study was composed of 51.4% male of the respondents and 48.6% were female. This suggests dominance of men in the rice QDS farm sector.

The majority (95%) of the respondents were found to be literate with qualifications ranging from primary education to college/tertiary level, while only 5.0% of the respondents had no formal education. Education level is used to measure the ability of a person to utilize the available information to increase production. Education also influences decisions being taken in the household and farm management more specifically on unequal gender roles (Kulyakwave1 *et al*., 2019).

Table 4.1: Social-demographic characteristics

Variable	Frequency	Percent
Age of respondents		
18-24	21	9.6
25-34	44	20.2
35-44	61	28.0
45-54	45	20.6
55-60	34	15.6
61 and above	13	6.0
Sex of respondents		
Male	112	51.4
Female	106	48.6
Education level of respondent		
No formal education	11	5.0
Primary education	170	78.0
Secondary education	34	15.6
College education	2	0.9
Graduate and above	1	0.5
Marital status		
Married	157	72.0
Single	32	14.7
Divorced	2	0.9
Widow/Widower	12	5.5
Separated	10	4.6
Cohabiting	5	2.3

A literate society is better in understanding and is competent in performing different activities including rice QDS. Thus, education level is one of the basic measures which

can be used to decide the status of the society. Low level of education explains inability in social and economic spheres of life. Lack of ability is reflected in less control over income, bargaining power in selling own produce and labour (Jeckoniah *et al.*, 2012).

Although most (95%) of the respondents seem to be literate and that they can read and write, the results indicated that women do not attend regular training to update them with the changing world. For rice QDS development to be successful, among other factors, women should be exposed to regular trainings as men's do. These findings are also supported by Kulyakwave1 *et al*. (2019), who pointed out that adequate education could help farmers in technology acceptance and accessing extension services.

According to Kulyakwave1 *et al*. (2019), marital status of farmers has significant influence on rice yield. In this study, the majority (72%) of the respondents were married, while 28% were divorced, single, widowed (widows and widowers), separated/divorced and cohabiting. These results suggest that the society is matrimonially stable. The findings also imply that married couples are more experienced and are capable of sharing knowledge and capital to influence yield. These findings are consistent with some past quantitative findings reported by some scholars (Ngailo *et al*., 2016; Mango, 2018; Otekhile, 2019). However, the article supports a thesis by Kulyakwave1 *et al*. (2019) who noted that higher number of household members could contribute more to the households' welfare if all are engaged to QDS rice production.

4.5 **Gendered Farm Ownership**

Slightly more than one-third (34.9%) of the respondents used rented land, while (31.2%) had bought land for their farm activities and very few (19.7%) had inherited. Few (14.2%) borrowed land from their family members. The respondents owning land had wider

chances to practise crops diversifications, and could lease land to other famers. In return, money obtained from selling crops help to cover some farm operations such as costs for weeding, fertilizer and improved seed purchases and also irrigation. The majority of women farmers did not own land but rented the land they used for cultivation. This is because the communities they lived in were male dominated and the culture did not allow women to inherit land while others did not have money to buy land. Women farmers were not allowed to be given land by the family because of the patriarchal system in the study area which favours men and marginalises women.

According to Minde (2015), who studed gender role in chagga ethinic group, study found that there was no equality by 90% on ownership and control of resources. The inequality was highly skewed to land ownership. Women had only full access to land and other resources but not ownership of any. Also, Mukasa and Adele (2016), in their study on gender equality in agriculture in sub-Saharan Africa, found that the most dominant land tenure system was still customary or communal, which generally considers women as not worthy of acquiring or inheriting land property rights. Without access to land, which is one of the most important input factors for performing agricultural activities, women are thus confined to be labourers, and to lack sufficient power to either influence production decisions within the household or control the allocation of agricultural income. However the study was conducted in different context.

All FGDs arrived at a similar compromise. The statement and the FGDs elaborate how some women experience socially imposed barriers to produce rice QDS because of lack of land. One explanation of the findings is that land is an important asset for human's survival. It is a major source of income and livelihoods for most rural people as it is for urban dwellers. The finding resonates well with a past research conducted elsewhere

(Loserian and Jeckoniah, 2018). Given the importance of land, access to and availability of land resources are critical to ensure real and long-lasting improvements in social, economic and political well-being. The ownership and utilization of land as a productive resource for rice QDS and as an important asset directly defines wellbeing among the farmers in the community.

Sikira and Kashaigili (2016), argue that there is a positive relationship between farm size and increase in food production. Thus, it is expected that farmers with larger farmlands would cultivate rice QDS since rice QDS require enough land for isolation. Different from the expectation, it was found that only few (3.2%) respondents had farms with sizes within the range of 4.5 ha acres and above. This implies that the majority (96.8) of farmers have small proportion of farm size (less than 4.5 ha) that would support rice QDS. Farm size in this case is the total area of the cultivated land measured in acre.

In addition the study revealed that lack of enough land has been a stumbling block for women in the male and female headed household in engaging in rice QDS. For instance, it was found that 33.5% of the respondents produced rice on farms owned by their parents and only 2.3% of the respondents had farms which are jointly owned by husbands and wives. The results showed further that 30.9 % of the respondents produced rice on farms owned by non-family members where more than three-quarters (76%) of such farms were owned by men. Overall, the results imply that men dominate women in farm ownership. Farm ownership can serve as collateral for accessing credit. The findings are in line with findings of a study by Sikira and Kashaigili (2016) who pointed out that lack of control over land endangers women’s ability to improve their livelihood. However, Sikira and Kashaigili did not focus on QDS instead; they focused on gendered access and control over land and water resources in the Southern Agricultural Growth Corridor. Overall, the

constraints to land ownership also affect QDS rice farmers as women cannot use their land to access loan from financial institutions. A unique finding of this study is that participation of women in the production of rice QDS will be achieved through land ownership. Also, the study details that for efficient and effective rice QDS production, there is a need to address gender inequalities among rice producing communities.

4.6 **Gender Roles in Pre-planting and Planting Operations**

Gender roles in pre-planting and planting operations as presented in Table 4.2 indicate that more men (24.8%) were involved in land preparation compared to women (20.2%). Men and women (55%) were also jointly involved in land preparation. This confirms earlier findings by Leavens and Anderson (2011) that men and women farmers jointly grow food and cash crops in Tanzania.

Table 4.2: Pre-planting and planting operations

Gender	Land preparation		Nursery preparation		Sowing seeds	
	n	%	n	%	n	%
Men	54	24.8	38	17.5	27	12.4
Women	34	20.2	35	16	62	28.5
Men and Women	120	55	74	34	113	51.9

The findings indicate further that gender roles in nursery preparations were mainly carried out jointly (34%). Results about the seed sowing operation show that more women (28.5%) were involved in this activity compared to men (12.4%). Seed sowing is also jointly done by men and women (51.9%). These findings concur with findings of a study by Leavens and Anderson (2011). These results are also in concordance with empirical information such as Rutsaert and Akter (2017) who found that in South-East Asia, men take a lead role in pre-planting operations while women are primarily involved in seed sowing operations.

4.7 **Gender Roles in Post-planting**

As shown in Table 4.3, women participate more in transplanting seedlings (19.2%) against (12%) of men. More women (25.2%) also participate in weeding than men (9.7 %).

Table 4.3: Post-planting operations

Gender	Transplanting seedlings		Weeding		Fertilizer application		Pest management		Bird scaring	
	n	%	n	%	n	%	n	%	n	%
Men	26	12	21	9.7	51	23.4	89	40.9	14	6.5
Women	42	19.2	55	25.2	36	16.5	32	14.7	46	21.1
Men and Women	74	34	141	64.7	107	49.1	73	33.5	96	44
None	76	34.9	1	0.5	24	11.0	24	11.0	62	28.4

Fertilizer application and pest management involved higher per cents of men (23.4% and 40.9% respectively) while bird scaring involves higher participation of women (21.1%). In the study area pest management involves using of pesticides which are sometimes applied using a knapsack sprayer. Knap sack sprayers need to be filled with pesticides mixed with 20 litres of water, carried on the back for spraying the entire farm. The activity sometimes takes one or two days. In line with the findings, Coker *et al.* (2017) equally found predominance of women in transplanting and weeding operations of rice production in Ghana. Similarly, earlier an analysis by Akyoo *et al.* (2019) showed that women in Tanzania do more farm weeding operations than men.

4.8 **Gender Roles during Harvesting Period and Post-Harvest Operations**

Gender roles associated with harvest and post-harvest operations are analysed and presented in Table 4.4. The harvesting operation majorly involves joint efforts of men and women (65.1%) as against an individual effort of men (15.6 %) and women (18.8%).

Table 4.4: Gender roles during harvesting period and post-harvest operations

Gender	Harvesting		Winnowing		Storage	
	n	%	n	%	n	%
Men	34	15.6	14	6.5	55	25.2
Women	41	18.8	125	57.3	40	18.3
Men and Women	142	65.1	62	35.4	117	53.6
None	1	0.5	2	0.9	6	2.8

From the findings as presented in Table 4.4, the majority (57.3%) of women participated in winnowing. On the other hand, both men and women (53.6%) participated in storage activities. The findings are contrary to findings of a study by Coker *et al*. (2017) who contend that the harvesting operation records an almost equal degree of participation by men and women and is consistent with findings from Ghana. These results are in line with findings by Akter *et al.* (2016) who found that women are particularly more active in post-harvest operations including winnowing crop products and storage.

4.9 **Gender Roles in Packing, Labelling and Grading, and Marketing Operations**

Table 4.5 shows packing operation as well as labelling and grading operations mostly carried out by men as represented by 38.9% and 32.1% respectively. Packing is normally considered as a men's activity because of their more physical strength than women. Sometimes men participate in packaging of agricultural produce because packaging is closer to marketing, and closer to obtaining money. However, the marketing activity was done by 23.9% of women. This is consistent with findings by Leavens and Anderson (2011) which documented that women take the lead in crop marketing in Tanzania.

Table 4.5: Packing, Labelling and Grading, and Marketing Operations

Gender	Packing		Labelling and Grading		Marketing	
	n	%	n	%	n	%
Men	85	38.9	70	32.1	41	18.9
Women	35	16.1	32	14.7	52	23.9
Men and Women	66	30.3	66	30.3	100	45.6

None	32	14.7	50	22.9	25	11.5

4.10 **Conclusions and Recommendations**

The conclusions and recommendations drawn from this paper aim at upgrading the rice QDS and mainly focus on women because they are the ones left behind. The results, as discussed in this paper, revealed that unequal gender roles exist between men and women in the study area. This means, women farmers in the society play more and heavier roles in rice farming than men. The paper therefore concludes that there are viable opportunities to enable women farmers come out from heavy workload through educating society on how they can reduce women workload and also get support from men in order to maximize their use of rice QDS.

The paper recommends that Local Government Authority, Community Development Officers and gender experts should promote gender sensitivity and awareness programme at the family level so as to ensure that gender roles in rice QDS rice are equitably played by men and women. It is especially important for men to accept the gender mainstreaming concept and actively practise such ideas in their households and communities.

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CHAPTER FIVE

5.0 Factors Influencing Decision-Making Power in Quality Declared Seed (QDS) Production in Kilombero, Morogoro, Tanzania

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Abstract

This paper assesses factors influencing decision-making power in rice QDS in Kilombero District, Morogoro, Tanzania. A cross-sectional research design was used during data collection. Quantitative data were collected through administering a questionnaire to 218 respondents engaged in rice production. Similarly, qualitative data were collected through focus group discussions and key informant interviews to complement quantitative data and allow triangulation of data. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) while qualitative data were analysed using content analysis. The results show that decision making power among women in the community is very low, making decline in rice QDS in one way or another. The study therefore concludes that, there is an opportunity for more farmers to produce and use rice QDS in the study area. This will be possible through proper information dissemination and provision of support and training needed by the farmers to change women and men's perception towards decision making power at the family level. It is recommended that development practitioners should sensitize communities on women's awareness on their rights in decision making and minimize conservative gender-biases, understanding of religion and ignorance of socio-cultural principles regarding women. This will increase rice QDS production.

Keywords: gender, gender relations**,** recycled seed, quality declared seed, improved seed.

5.1 **Introduction**

In Africa, gender discrepancy is more pronounced in rural areas than in urban areas, and women are the main victims (Seleman, 2017). Women in Tanzania, like in other developing countries, are underprivileged socially and economically (Jeckoniah, 2013; Madaha, 2018). The government of Tanzania is determined to improve agricultural production and attain gender equality in the agricultural sector. The national Agricultural Policy of Tanzania treats gender as an important cross-cutting issue that should be addressed in order to improve agricultural production (URT 2013).

Traditionally, women have limited roles in decision-making processes and laws, which are important for poverty reduction, food security and environmental sustainability (Seleman, 2017). The causes of women's exclusion from decision-making are closely linked to their additional reproductive roles and their household workload, which account for an important share of their time. Though women play a major role in food decisions in many cultures, it is increasingly recognized that studies need to target both women and men with massages on roles that men often play in influencing women's decision-making (Tsikata and Yaro, 2014). Women are less empowered compared to men in many aspects such as education attainment, income, control over own income, bargaining power in selling and labour, participation in decision making bodies, access to production inputs, land and employment opportunities (Jeckoniah, 2019).

Improving agricultural productivity involves increasing farmers' access to inputs such as quality rice seeds. Ravinder *et al.* (2007) regard improved seeds as "a powerful agent of change," with the potential of making a difference in the lives of the poor and marginalized farmers like women. Abebe and Alemu (2017) up hold that access to good quality seeds could ensure higher productivity up to 40% increase. However, Mligo and

Msuya (2015) observe that the supply of quality seeds for many years through formal seed system has not been satisfactory. The majority (90%) of smallholder farmers including marginalized farmers continue to use recycled seeds (TOAM, 2015). This reveals that seeds produced by formal seed companies are not only expensive and unaffordable by marginalised farmers but also they are not enough to satisfy the requirements, Similarly, production and sale of certified seeds by the formal sector (both public and private) has not been satisfactory to meet national seed demand, estimated at 212 274 MT per year (NBS, 2014). In Tanzania, there are two types of seed systems: (i) the formal system which is market oriented and developed by the public and/or private sectors and (ii) community production system, an informal system, which is mainly based on seed self-provisioning exchanges and gifts among neighbours.

The Quality Declared Seed (QDS) programme in Tanzania was introduced by FAO in early 2000s to make it possible for production and utilization of quality seeds by rural farmers in remote areas who were not reached by the formal seed companies. Quality declared seed (QDS) refers to a form of quality assurance that was created to reduce the burden of rigorous conventional seed certification process, while retaining the basic characteristics of external quality assurance, and thereby increasing access to quality seed for smallholder farmers. The main goal of the programme was to improve availability of improved seeds, and hence increase the use of QDS among smallholder farmers for increased agricultural productivity. QDS are quality seeds produced by small-scale farmers who are trained by Tanzania Official Seed Certification Institute (TOSCI) (2018) under supervision of Seed Inspectors working for Local Government Authorities (LGAs).

The Tanzanian government is also determined to develop agricultural production and attain gender equality in production. The national Agricultural Policy of Tanzania treats

gender as an important cross-cutting issue to improve agricultural production (Mnimbo, 2017). The government states that Tanzanian women constitute the majority of agricultural labour force 90% producing about 70% of the country's food requirements (URT, 2015). Nonetheless, women face a number of challenges related to gender inequality, hence difficulty to attain sustainable agricultural productivity (Madaha, 2012). Women continue to face a number of challenges in the sector including inadequate skills and knowledge. They rarely own land, get education due to discriminatory access, and their access to productive sources as well as decision-making tends to occur through the mediation of men (Ellis, 2000; Seleman, 2017). Women face decision-making constraints due to cultural, traditional and sociological factors. Their work in the agricultural sector is largely ignored, even though they make up about three-quarters of the agricultural work force (FAO, 2015). Other challenges are inappropriate technologies and inappropriate socio-cultural practices and beliefs (URT, 2013). Due to these facts, progress in the agricultural sector is hindered severely. Thus, gender relations need to be fully integrated into the agricultural sector, if real progress has to be attained. This paper, therefore, assesses factors which influence decision making power in rice QDS to highlight areas for boosting rice QDS among smallholder farmers in Kilombero District.

Women constitute most of the labour force in rice production and related activities that include planting, irrigating, weeding, harvesting, threshing, winnowing, and sorting. Although men get engaged in such activities, they spend fewer hours than women (Lusuva, 2015). Men are the ones who usually sell the crop products and make decisions on how income is to be spent in the household (Madaha, 2018). Although in some fewer family's men may involve women in some discussions, still men make the final decision (Lusuva, 2015). Furthermore, women lack the power to make decisions related to agricultural productivity including use of the QDS in rice productivity. Studies have been

done on the factors influencing decision making power, however, to the best of our knowledge there are no studies that have considered factors influencing decision making power in rice QDS. Thus, the study on which this paper is based, taking a case of Kilombero District, focused on assessing factors influencing decision making power in rice QDS in order to highlight areas for boosting rice QDS among smallholder farmers, bearing in mind that there has been sharp decline of rice QDS in the country (TOAM, 2015).

The paper is in line with various national and international policies and programmes that focus on different aspects of agriculture. The findings from the paper are in line with Sustainable Development Goal (SDG number 2). This goal emphasizes on ending hunger, achieve food security, improve nutrition and promote sustainable agriculture (FAO, 2015). The findings also contribute to SDG Goal number 5 that aims at achieving gender equality and empower all women and girls. This paper is further in concordance with the objectives of Tanzania's second Agricultural Sector Development Programme (ASDP II), a national key document, which emphasizes on increasing agricultural productivity, profitability and farm incomes (URT, 2016). The paper is again in line with the National Rice Development Strategy (NRDS), which focuses on food security and achieving self-sufficient staple food production (URT, 2013).

The findings have a great potential to help increase awareness of the entire system of rice QDS in Kilombero District and in Tanzania at large. Moreover, the findings are important to the agriculture planners, policy makers and implementers towards improving smallholder farmers' lives through increased access to quality seeds and equality in decision-making and resource control for the betterment of all family members. Furthermore, the study contributes to the general body of knowledge as secondary data

(reference) for future studies in agriculture. The paper aimed at assessing factors influencing decision-making power in rice QDS among farmers in Kilombero.

5.2 **Theoretical Framework**

The paper was guided by Socialist feminism theory. The theory recognizes oppression of women within multiple identities such as race, sexuality, ethnicity, gender, and nationality. That is, socialist feminism recognizes that gender oppression is context specific. In this regard, socialist feminism synthesizes women's oppression by capitalism and patriarchy. It calls for inclusive movements by the oppressed women such as working-class women and rural peasants in collaboration with interested men to transform power relations in favour of a more just society.

The Gender and Development (GAD) strategy is a strand of socialist feminist theory that has become a buzz word in the Global South including Tanzania (Moser, 1993; Parpart *et al.,* 2000, Kabeer 2003; Brenner, 2014; Madaha, 2018). Informed by socialist feminism, this paper explored factors influencing decision making power among different genders. As such, GAD, as a strand of socialist feminist theory, is in a position to examine the existing gender inequalities, and opportunities in decision making powers, responsibilities and power across rice QDS in Kilombero District.

5.3 **Methodology**

The study on which this paper is based was conducted in Kisawasawa, Mang'ula and Nkula Wards in Kilombero District, Tanzania (Figure 5.1). The rationale for choosing Kilombero District was: (i) Presence of farmers registered for QDS rice production (TOSCI, 2018) and (ii) The district being one of major rice production and supply districts in Tanzania (Mligo and Msuya, 2015). The population for this study consisted of

all rice farmers (also referred to as rice producers) of Kisawasawa, Mang'ula and Nkula Wards in Kilombero District Council with some access to QDS. The study employed cross-sectional research design whereby data were collected at a single point of time.

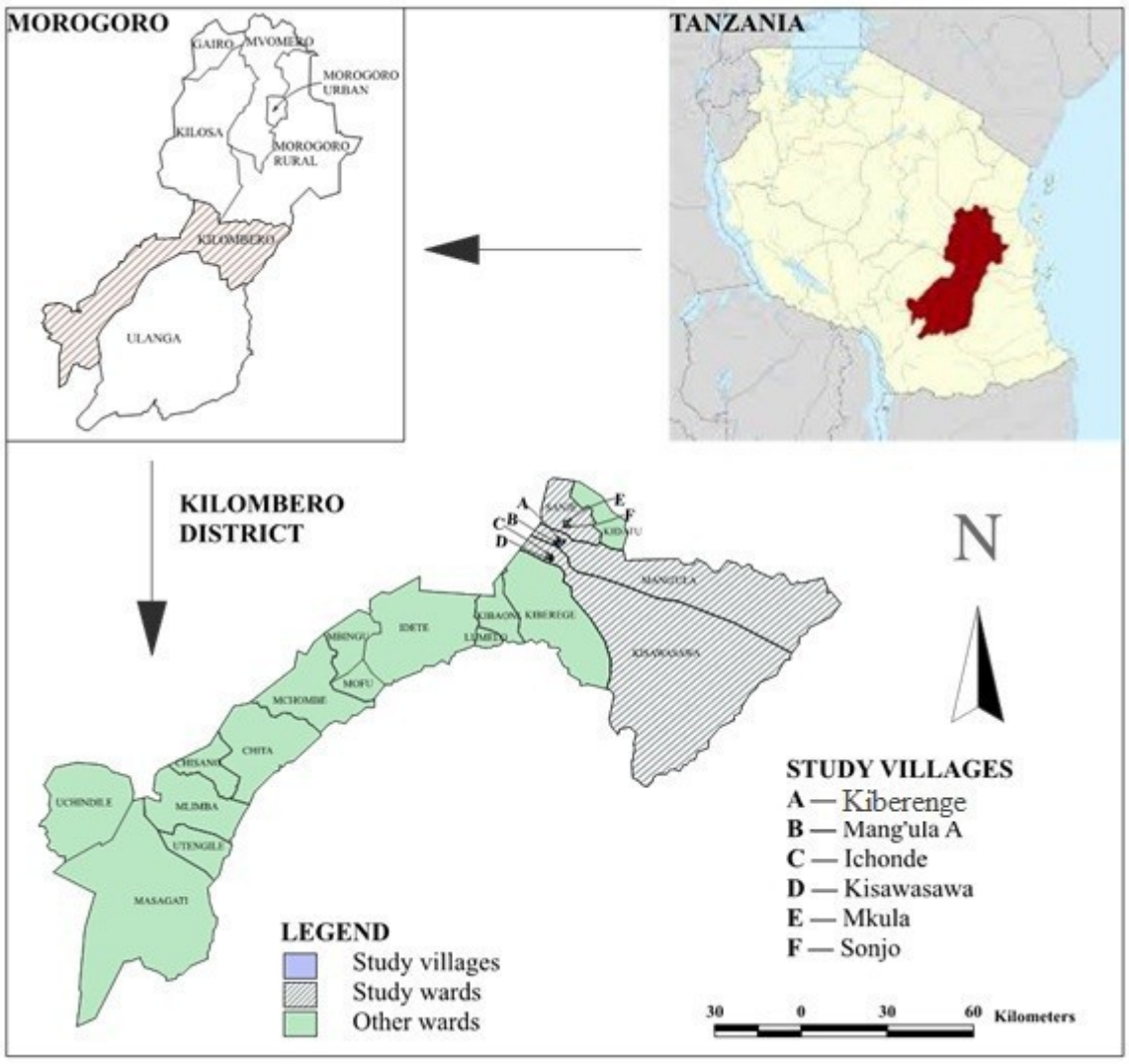

Figure 5.1: Map of study area in Morogoro region

The unit of analysis was an individual farmer producing and utilizing QDS. These involve farmers who at same point in their life participated in QDS production, individual or in a group. A representative sample was drawn from all rice farmers who were producing or utilizing QDS. The sample size was determined by using Yamane (1967)'s formula.

Simple random sampling procedure was used to select a representative sample of rice

producers. A sample of 389 smallholder rice farmers was randomly chosen. To ensure that the number of sampled smallholder farmers in a particular village was proportional to its total number of farmers, proportionate stratified random sampling was applied. However, a sample of 218 was available during the survey for interview.

Both primary and secondary data were collected for the study. Primary data were mainly collected by using quantitative and qualitative methods. A semi-structured interview guide was employed to collect qualitative and some descriptive data. A structured questionnaire comprising closed, and open-ended questions was designed to solicit information from respondents.

Data entry and cleaning were done after data collection. Quantitative data were analysed using Statistical Product and Service Solutions (SPSS) version 20. Specifically, SPSS was used to generate descriptive statistics including percentages. Qualitative data were analysed using content analysis. All of the data were presented in line with the study objectives.

5.4 **Results and Discussion**

The results in Table 5.1 show that the maximum age of the respondents was 61 years while the minimum age was 18 years. A good proportion of total respondents (68.8%) fell within the age groups of 25 to 34 (20.2%), 35 to 44 (28%) and 45 to 54 (20.6%) years, meaning that the majority of the respondents were matured enough to be involved in any household decision.

Concerning educational level, the majority (95 %) of the respondents were literate with qualifications ranging from primary education to college/tertiary level, while only 5% of the respondents had no formal education. Education level is used to measure the ability of

a person to utilize available information to increase production, also to influence major decisions being taken in the family and in farm management (Thabit, 2014).

Table 5.1: Social-demographic characteristics

Variable	Frequency	Percent
Age of respondents		
18-24	21	9.6
25-34	44	20.2
35-44	61	28.0
45-54	45	20.6
55-60	34	15.6
61 and above	13	6.0
Sex of respondents		
Male	112	51.4
Female	106	48.6
Education level of respondent		
No formal education	11	5.0
Primary education	170	78.0
Secondary education	34	15.6
College education	2	0.9
Graduate and above	1	0.5
Marital status		
Married	157	72.0
Single	32	14.7
Divorced	2	0.9
Widow/Widower	12	5.5
Separated	10	4.6
Cohabit	5	2.3

A literate society is better at understanding and competent in performing different activities including rice QDS. Literacy increase participation in decision making and give

authority to the participants to stand firm to the decisions they take. Thus, education level is one of the basic measures which can be used to decide the status of the society. Low level of education explains inability in decision making in social and economic spheres of life. Lack of ability is associated with less control over own income, low bargaining power in selling own produce and labour (Jeckoniah *et al.*, 2012).

Less education makes it difficult for women to make decision in rice QDS in the family (Madaha, 2012, 2018). Less education also prevents women from making decision on adopting new technologies as readily as men do (Fakih, 2015; Kulyakwave1 *et al*., 2019). These findings are also supported by Kulyakwave1 *et al*. (2019), who pointed out that adequate education could help farmers to make decision in technology acceptance and accessing extension services.

Furthermore, the survey results indicated that the majority (72%) of the respondents were married, while less than one-third (28%) were divorced, single, widows/widowers, separated/divorced and cohabiting. One explanation of this for the study is that the society is matrimonially stable. A study by Kulyakwave1 *et al*. (2019) has revealed that marital status of farmers has significant influence on rice yields. According to Mnimbo (2018) married people decided jointly to use modern technology such as improved seed, lead to increased income and yield as opposed to unmarried/divorced. According to Bullock et al., (2017) confers with the study's finding that decision-making within married couples has to do with bargaining, and this bargaining depends on the contributions of the parties and that a woman's ability to bargain in the family is usually augmented by the increase in her income, which leads to greater equity in the dispensation of household resources. In the FGDs, women in Kilombero argued that, women's decision-making power increases when they earn more than men or just as much as men do.

5.5 **Decision-Making Power in QDS among Rice Farmers**

5.5.1 **Decision-making on general issues and where to get rice QDS**

The results of the survey analysis presented in Table 5.2 show that in the study area almost half (42.6%) in general decision making well as in making decisions regarding where to get QDS (43.5%) is jointly done by both husband and wife.

Table 5.2: Decision makers on general issues and where to get rice QDS

Gender	General decisions		Where to get QDS	
	n	%	n	%
Husband	71	32.6	75	34.4
Wife	53	24.3	46	21.1
Husband and wife	93	42.6	95	43.5
Parent	1	0.5	2	0.9

However, there is still high percentage of decisions made by husbands only since it was identifying that 32.6% of the general decisions and 34.4% of the decisions regarding where to get QDS) in the study area are done by husbands. These results concur with findings by Ajewole *et al.* (2015) that men dominate in decision making regarding productive resources. During an FGD, it was revealed that women in the study area are not given much opportunity to decide on issues within the society and their family, although, they are allowed to participate in farmers' groups. This is shown in the quote below:

> *.. in our religion (Muslim), women are not allowed to participation on decision related to general society/ community this is men roles, a woman must be behind men: … of course women in our community are allowed to join farmers' group and they are allowed to decide issues in their group but not family matter;*
>
> (A male participant at Nkula village, Ifakara District, Morogoro 4/11/2019)

5.5.2 **Decision making on cropping and sales of produce**

The results presented in Table 5.3 show that decisions on which crops to grow, how much of staple food crops to grow, including how much to keep for consumption, and for sale, as well as who sells the produce in the market, are mainly taken by men in the study area.

Table 5.3: Decision makers on cropping and sales of produce

Gender	Which crop to grow		How much of staple to grow		How much to keep for consumption, and for sale		Who sells the produce in the market	
	n	%	n	%	n	%	n	%
Men	82	66	67	30.7	53	24.3	75	34.6
Women	28	45	49	22.5	50	22.9	52	24.0
Men and women	58	10.5	101	46	115	48.2	86	39.6
None	1	0.5	1	0.5	-	-	4	1.8

The results in Table 5.3 are in line with previous empirical findings by Leavens and Anderson (2011) that, in Tanzania, decision about how much land to allocate to each crop enterprise is usually made by men. However, the results also indicate that in some households these decisions are also jointly taken by men and women.

5.5.3 Decision making on attendance of training, management of family farm, and expenditure

The results of the survey analysis presented in Table 5.4 indicate that decisions on who attends training, who manages the family farm, as well as on spending partner's income are mainly taken by men (41.7%, 25.2%, and 33.0% respectively). Moreover, men also dominated in decision making regarding smaller purchases (31.2%) and more expensive purchases (34.9%). Women are the main produces of agricultural crops in the country; if they lack decision making power on attending training which will enable them to get knowledge on how to produce crops, management of family farm, expenditure etc. then agricultural productivity is likely to decline. According to Kahamba and Sife (2014), decision making power is important because it influences other dimensions such as asset ownership, resources control, self-worth and recognition.

Table 5.4: Decision making on attendance of training, management of family farm, and expenditure

Gender	Who attends trainings		Who manage family farm		Spending of partner's income		Smaller purchases		More expensive purchases	
	n	%	n	%	n	%	n	%	n	%
Men	91	41.7	55	25.2	72	33.0	68	31.2	76	34.9
Women	58	26.6	49	22.5	38	17.4	56	25.7	55	25.2
Men and Women	69	31.7	114	52	108	49.2	94	43.1	87	39.9

5.6 **Factors Influencing Decision-Making Power in rice QDS among Rice farmers**

The multiple linear regression results presented in Table 5.5 illustrate several factors that influence rice QDS farmers.

Table 5.5: Factors influencing decision-making power among rice QDS.

Variable	B Coefficient	S. E	p-value
Age of respondent	0.1	0.1	0.1**
Sex of respondent	0.2	0.1	0.1*
Marital status of respondent	0.1	0.1	0.01**
Education level of respondent	0.1	0.0	0.01**
Household size	0.3	0.1	0.1**
The size of QDS farm	0.1	0.0	0.01**
Access to credit	0.1	0.2	0.6
Access to agro dealer	0.3	0.2	0.2
Access to extension service	0.2	0.1	0.0**
Fertilizer	0.2	0.1	0.2
Pesticides	-0.0	0.1	1.0
Training on QDS production	0.1	0.0	0.0**
Member in any agricultural organization	0.4	0.2	0.0
Distance from home to the market (km)	-0.1	0.1	0.3
Distance from home to the storage facility (km)	-0.2	0.1	0.1*
Storage facilities	-0.1	0.2	0.6
Income from off-farm activities	0.1	0.1	0.3

* means
** means

The multiple linear regression results in Table 5.5 show a positive relationship between age and quantity of rice produced by rice QDS farmers, and was found to be statistically significant ($p < 0.05$). The positive coefficient suggests that age had a positive influence

on the productivity of the rice QDS farmers. It as well implies that, *ceteris paribus*, the yield of rice increased by a factor of 0.10 as farmer's age increased by one year. Hence, rice QDS yield could be higher among older farmers in their productive age. The findings are similar to those found by other scholars such as Jeckoniah (2019) who found that age of the farmer was a significant predictor for their participation in agriculture in Kilombero Valley, Tanzania. Contrary to these findings, Urassa (2015) found that age of the farmer had no significant effect on maize yield in Rukwa Region in the southern highlands of Tanzania.

Sex and marital status of the respondents positively and significantly ($\rho \leq 0.01$) influenced QDS rice production (kg/acre) of the farmers. Furthermore, education ($p = 0.055$), household size ($p = 0.251$) and size of the QDS farm ($p = 0.070$) had positive and significant influence on QDS rice production. The positive coefficient of education implies that holding all other factors constant, there was a likelihood that if the level of education of the rice QDS farmers increased by one more year of formal education, their QDS rice production could increase by about 5% in output. This suggests that literacy level positively influenced farmers' productivity. Similar findings and implications are found in previous empirical works such as Awotide *et al.* (2012) and Ngailo *et al.* (2016) who found that higher literacy level leads to increased rice production in Tanzania. Similar to the results for the size of the rice QDS farm (0.070), Ayedun and Adeniyi (2019) found that area of land cultivated in hectares significantly influences rice farm output in Nigeria.

Moreover, it is evident from Table 5.5 that access to credit had positive but insignificant relationship with rice QDS. The insignificant coefficient of access to credit implies that QDS rice farmers not having access to credit could not produce more area under rice

QDS. This could be explained by the fact that cash is needed to invest on complementary and productivity enhancing technologies such as land ploughing and irrigation where necessary. For example, to plough one acre of land in the study area, costs of about TZS 50 000 were incurred, and harrowing costs were about TZS 50 000, while seeds cost about TZS 50 000 for 20kg/acre, and sowing seed as well as transplanting costs were TZS 80 000. Also, weeding and herbicide costs were about TZS 160 000 twice to thrice per season. Pesticides application per acre costs were TZS 40 000, harvesting costs about TZS 100 000 per acre, winnowing costs were TZS 50 000 per acre, and transportation costs were TZS 100 000 per acre. The average cost of rice producing on one acre in the study area was about TZS 700 000. This means that farmers needed credit for producing rice, but credit was not available. Therefore, credit was not playing a significant role in their production. This finding substantiates an empirical finding by Kinuthia (2018) which shows that credit has no significant effect on agricultural productivity in Tanzania because farmers lack access to credit. Also, Arslan *et al.* (2016) found no significant evidence of influence of access to credit on maize productivity in Tanzania. The positive and significant influence of access to extension service on rice QDS suggests that farmers who had access to extension services could perform better in rice QDS than farmers who had no access to extension services (Lyimo, 2020).

Contrary to expected findings, Table 5.6 shows that off-farm income had no significant influence on the output of rice QDS farmers. Although the coefficient was positive, it was not significant, suggesting that farmers spent off-farm income on other activities such as smoothing consumption rather than on improving rice QDS. This result is in line with Amare and Shiferaw (2017) who found that agricultural productivity under smallholder agriculture declines as non-farm income increases.

5.7 **Conclusions and Recommendations**

5.7.1 **Conclusions**

The findings in this study indicate that decision making power among women in the community is very low. In one way or another, this makes decline of rice QDS. It is obvious that decision making at the family level gives women power of self-confidence, self-worth and self-recognition. According to Kahamba and Sife (2014), women decision power increases as they are able to contribute to the family. Credit institutions should empower women with credit to help them undertake agriculture activities to provide them with income. This will improve ability to own and get control over resources, assets and finally increases their decision-making power.

5.7.2 **Recommendations**

Since agriculture is the main women's economic activity in rural areas, agricultural development programmes should be given priority as a process of empowering women. This will enable women to play their roles and participate effectively in decision making and achieving higher agricultural productivity. It is therefore necessary for government and development partners to increase gender mainstreaming education in the community in order to provide more participation opportunities for women in decision making so as to improve women’s socio-economic status. Gender sensitive training should first be considered by LGAs planners because it can help to combat other challenges in mainstreaming gender. Empowering the communities with decision making at village level is essential. Since low level of gender equality was observed in rural areas, policy makers and LGAs should employ gender sensitizing bodies such as media, newspapers, NGOs, CBOs and gender activists to provide gender mainstreaming measures targeting both women and men in Kilombero District.

In order to change women’s and men’s awareness towards decision making power in participation in development aspects, it is recommended that development practitioners should sensitize the society/community, by mainstreaming gender in the community. This will increase women's awareness on their rights and minimize conservative gender-biases, understanding of religion and ignorance of socio-cultural principles regarding women. Therefore, power of decision making and control over resources, benefits allocation and roles in QDS rice production are expected to be influenced by gender.

CHAPTER SIX

6.0 Summary of Findings, Conclusions and Recommendations

The study on which this thesis is based addressed four main issues regarding rice quality declared seed (QDS), including gendered access and control over rice QDS resources among rice producers, attitude of farmers towards rice QDS, gender roles of men and women in QDS rice production, and factors influencing decision-making power in rice QDS in Kilombero, Morogoro, Tanzania. In this chapter, the main findings of the study are summarised, conclusions in terms of lessons learnt from the findings are given, and recommendations to improve rice QDS in view of gender relations, derived from the conclusions, are given. Moreover, theoretical implications of the study findings, contribution of the study, policy implications and areas for further research are given.

6.1 Summary of Findings and Conclusions

6.1.1 Gendered access to and control over QDS resources among rice producers

The study assessed the gendered access to and control over rice QDS resources among rice producers. The results showed that access to resources such as credit was very low among farmers in the area even though women (45%) were found to have more access to credit than men (13%) did. On the other hand, men were found to have more access to inputs (22%) and agricultural training (29%) than women. Women in the study area had access to land too but lacked control over it. Cultural barriers strongly affected and influenced ownership of women farmers' resources including land for rice quality declared seed production. It is concluded that women get less benefits in rice QDS due to poor access to and control of productive resources. Factors such as lack of land ownership hinder effective participation in rice QDS. It is recommended that the pathways for addressing gender-based constraints should be based on three major aspects; the division

of labour, household decision-making and access to and control of productive resources. This will enable not only a better positioning of women in the rice QDS and but also active participation of men hence, increased yields and achievement of food security.

6.1.2 **Attitude of rice farmers towards rice QDS**

The study examined attitude of farmers towards QDS rice in Kilombero District, as a study area. The results showed that the majority of farmers had positive attitude towards rice QDS because rice QDS gives more yield than local seed varieties. High technology cost in using QDS was found to be one of the barriers to many farmers to use rice QDS. Therefore, it is concluded that there is a viable opportunity to enhance farmers' produce by using rice QDS in the study area through appropriate information dissemination and provision of support and training needed by the farmers to maximize their produce and use of rice QDS.

6.1.3 **Gender roles of men and women in rice QDS**

Gender roles and responsibilities in rice QDS have an impact on agricultural production. That is inequalities can prevent the efficiency of the production. Using Kilombero District as a study area, the study assessed gendered roles of rice farmers in production and utilization of rice QDS. It was found that women play a major role in rice QDS. Men are predominantly engaged in land preparation, fertilizer application, pest management, packaging, labelling, grading and storage while other farming activities were carried out by women. Therefore, it can be concluded that unequal gender roles exist between men and women in rice QDS in the study area.

6.1.4 **Factors influencing decision-making power in rice QDS**

The study analysed factors influencing decision-making power in rice QDS in Kilombero District, Morogoro, Tanzania. The results showed that decision making power among women in the community was very low. In one way or another, this makes rice QDS decline. Therefore, it is concluded that there is an opportunity to more farmers to produce and use rice QDS in the study area through proper information dissemination and provision of support and training needed by the farmers to change women's and men's perception about decision making power at the family level up to the community level so as to be involved in rice QDS.

6.2 **Recommendations**

Based on the study's findings and conclusions it is recommended that:

6.2.1 **Gendered access to and control over rice QDS resources among rice producers**

There is a need to work on reducing all cultural barriers by creating awareness in mainstreaming gender for both men and women and using gender sensitive programmes. The Local Government Authorities (LGA) and communities (particularly the male farmer heads) need to re-consider the gender aspect when it comes to access and ownership of assets/resources as these affect involvements in rice QDS especially for women. Based on the study findings, there is a need for policy interventions at different administrative levels from the central to the local government to ensure men, and women have access to and they own resources to enable them participate and benefit equitably from rice QDS. Doing the above will enable farmers to sustainably improve their well-being. It also recommended that there should be policy interventions on land ownership and review of relevant land policies to ensure women have adequate access to and control over land which is of paramount importance in rice QDS.

6.2.2 **Attitude of rice farmers towards rice QDS**

To achieve increased rice QDS, the government and other non-governmental actors should create mechanisms of providing subsidy to improve access to rice QDS.

National Agricultural Input Voucher Scheme (NAIVS) was introduced to deliver inputs to small scale farmer. These inputs include rice QDS, rice QDS could bring an out standing change in yield in rice production. There is a need of the government to introduce back subsidy scheme under NAIVS. The mentioned actors should, among other things, offer credit to the producers to increase rice QDS.

6.2.3 **Gender roles of men and women in rice QDS**

Gender sensitivity and awareness programmes should be insisted on and conducted at the family level to ensure that gender roles in rice QDS become fair and popular.

At the family level, men need to recognize how women are burdened by the household activities; hence, there is a need to create a conducive environment for women to be more involved in QDS rice. At the community level, the local leaders (The village government / LGA) should encourage farmers on uptake of new technologies and innovations introduced by projects and extension staff such as using herbicides instead of the hand hoe in weeding, and using winnowing machines in order to allow more involvement of men in activities that were traditionally performed by women. Doing this will relieve women of their current heavy work burden. A policy need therefore to be gender aware if it is to address/ reduce gender inequalities. LGAs planners should make sure that the implementation of existing gender mainstreaming programme ensured according to government priorities and frameworks.

6.2.4 **Factors influencing decision-making power in QDS rice production**

Development practitioners should sensitize community on women's awareness of their rights in decision making and minimizing conservative gender-biased, understanding of

religion and ignorance of socio-cultural principles regarding women. This will increase rice QDS. Women need to actively contribute more in family level decision making.

Since, the overall gender relation in equality level was found to be low in decision making to women, hence more gender mainstreaming strategies have to be implemented at the LGA level so as to spearhead rice QDS development, then it is also recommended that men should be used by policy makers as agents for change towards gender equality in women decision making power as they occupy many decision making positions in LGAs, family and community as compared to women.

6.3 **Contribution of the Study**

6.3.1 **Contribution to literature**

An important contribution of the study is that rice QDS cannot be isolated from the rest of the challenges facing the agricultural sector. That is, there is a need for a holistic approach that addresses challenges in the agricultural sector including gender-based oppression. Isolated efforts are unlikely to be fruitful. Further, the findings from this study support the Gender and Development (GAD) theory. That is, socially constructed roles indeed affect not women alone but the entire community. There is a need to ensure gender equality to facilitate production and utilization of rice QDS.

6.3.2 **A unique contribution**

A unique contribution of this study is the identification of a number of reasons that block women from inheriting land in Kilombero context. First, there is a belief that land owned by a woman may be transferred to another man, if a husband dies. Second, a wife who divorces her husband may transfer her land to another man who marries her. The findings imply that interested women have less chances of producing QDS rice because of gender based discrimination. Women need to own an additional farm for producing QDS.

6.4 **Theoretical Implications of the Study Findings**

The findings have theoretical implications which are particularly relevant in explaining the gender dynamics in rice QDS in the areas with socio-cultural and agro-climatic conditions similar to those of the study area. According to the Gender and Development (GAD) theory, as an analytical framework, gender relations encompass information on men and women in terms of their roles, responsibilities, decision making power, access to and control over resources, and opportunities, as well as hidden power structures that govern the relationships between them. Gender relations in most societies tend to influence access of males and females to critical resources necessary for their development. However, access to and control over resources are important since gender relations in rice QDS consider gender as an important aspect that can hinder development (UNDP, 2010). Therefore, for the rice QDS to be achieved among smallholder farmers, it is very important to integrate gender at all levels. This was confirmed in this study. As such, GAD, as a strand of socialist feminist, helps examine the existing gender inequalities and opportunities in the distribution of resources, responsibilities and power across rice QDS in Kilombero District. On the other hand, through GAD, gender issues will be integrated in rice QDS to increase productivity and income, and hence contributing to poverty reduction through economic growth, and wealth and employment creation.

6.5 **Policy Implications**

Agricultural development generally needs involvement of both farmers' processes and Government based interventions. For individual farmers, the processes which relate to assets access and control, technological information and strategies are adopted to achieve desirable outcome of sustaining flow of income and avoid scarcities. Government interventions involve policies and other measures which are implemented by the

government at different levels of administration and also by non-governmental organisations (NGO's). These interventions assist farmers to pursue agricultural development activities and hence attainment of economic development.

Based on the above, two sets of specific policy implications are discussed focusing on the government interventions with regard to what transpired from farmers' effective participation in rice QDS. Policy implies that there is a need to promote equitable access and control over productive assets which was found to reduce the barrier to effective participation in rice QDS. The above can be enhanced by promoting and supporting farmers bargaining power and empowering women at the village level. At the village level, this falls under the village council and the Local Government Authorities (LGA) which have a role to supervise the same at the village level. District officers may provide education on resource management, access and ownership and how households can distribute the resources equitably.

Therefore, Agriculture policies should address issue related to equitable ownership as well as participation of women in through a review of relevant policies and strategies. At a broader perspective, a cross-sectoral approach to women empowerment and rural development is recommended.

Agricultural development policy makers at all ministerial levels should not assume women have equal access and control over productive resources; hence they should not go for "one size fits all" economic growth strategies. It is therefore critical that sectoral constraints are addressed to allow a clear focus on all the necessary production assets for economic growth or poverty reduction for example; human capital (skills and literacy levels), Social capital (ideas exchange, group membership, markets for crop products

which are considered to be women-based) and financial capital/assets (income, micro-credits/loans). Policies that focus on the above attributes, if properly implemented, will generally ensure increase of women's participation in rice QDS.

6.6 **Areas for Further Research**

Based on the study findings, some further investigations are hereby proposed as a consequence of the study's coverage. Effect of land tenure system and QDS production.

5.8 **References**

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