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INCLUSION OF WOMEN FARMERS IN CONSERVATION AGRICULTURE IN MALAWI

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ABSTRACT

Conservation agriculture (CA) is one of the land restoration activities currently being implemented in Malawi. It has been proven to have many benefits including increased soil fertility. Even so, adoption is low, especially among women who play an important role in agricultural activities in Malawi. Therefore, engaging more women is an opportunity to upscale CA. This study aims at understanding the relationship between women farmers' needs and successful adoption of conservation agriculture. It is always important to understand the needs of women in upscaling any agricultural technology. This is done with the assumption that understanding of these needs could potentially lead to upscaling of the technology or practice. Qualitative research methods were used to collect data. Focus group discussions with women farmers and key informant interviews were conducted in the Mwansambo extension planning area in central Malawi. In this area, CA activities have been promoted and practiced for over 10 years. Women are currently playing a key role in the upscaling of conservation agriculture and constitute the majority of participants. The labour burden together with limited access to inputs and land are the major challenges that women in the area face in CA adoption. Participants agreed that women were responsible for all domestic work, but key informants and women farmers had different opinions on how farm work is divided between men and women. Despite contributing much labour in farming, women have little or no power over decisions made concerning the land and selling of products after harvest. Even though women appreciate the benefits of CA for soil fertility and lessening their farm work, adoption among women is challenged by prevailing gender ideas that give all decision-making power to men as the household heads. With more gender sensitive approaches in promotion of conservation agriculture, women could play a key role in upscaling of the practice.

Key words: Conservation agriculture, gender division of work, Malawi agriculture, sustainable land management

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TABLE OF CONTENTS

1. INTRODUCTION.....	1
1.1 Background.....	1
1.2 Study Objectives.....	2
2. LITERATURE REVIEW.....	2
3. METHODS.....	4
3.1 Study Area.....	4
3.2 Data Collection.....	4
3.2.1 Focus group discussions.....	4
3.2.2 Key informant interviews.....	6
3.3 Analysis.....	6
3.3.1 Transcription and thematic analysis.....	6
4. RESULTS.....	7
4.1 Gender division of work and benefits within a farm household.....	7
4.1.1 A woman’s typical day of work.....	7
4.1.2 Gender division of farm work.....	8
4.1.3 Unequal sharing of benefits from farming.....	10
4.2 Land rights and ownership.....	12
4.3 Conservation agriculture practices and adoption.....	15
4.3.1 Understanding of the principles of Conservation Agriculture.....	15
4.3.2 Conservation agriculture adoption in Mwansambo.....	16
4.4 Conservation Agriculture benefits and challenges.....	17
4.4.1 Benefits of conservation agriculture.....	17
4.4.2 Challenges of conservation agriculture.....	18
4.5 Conservation agriculture support and upscaling efforts among women.....	21
5. DISCUSSION.....	23
5.1 Research question 1.....	23
5.2 Research question 2.....	24
5.3 Research question 3.....	25
6. CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNT.....	26
ACKNOWLEDGEMENTS.....	29
LITERATURE CITED.....	30
APPENDICES.....	30
Appendix I Focus Group Discussion Guide.....	33
Appendix II Key Informant Interviews.....	33

1. INTRODUCTION

1.1 Background

Women are among the social groups that are most vulnerable to food insecurity which has increased with climate change and destruction of natural resources such as land (FAO & CARE 2019). They are most affected by low yield which creates more pressure to source food for the household. In Malawi female farmers provide most of the labour force in all agricultural activities (Hyder & Behrman 2014). FAO (2019a), affirms that women are responsible for most of the world's agricultural activities. It is predicted that women will play a valuable role in the transformation of agriculture through climate change adaptation measures. This supports the idea that empowering women in agriculture may potentially result in a positive impact on food availability as well as on climate change mitigation (FAO 2019a). As women usually have more than one responsibility, it is important during implementation of an intervention to understand the approaches that provide an enabling environment for female farmers to participate.

Land degradation poses challenges to sustainable development and climate change mitigation and is stated as one of the largest contributors to climate change (Stockholm Environment Institute 2019). In Malawi land degradation is a major threat to farmland productivity. Conservation agriculture is one of the climate-smart technologies currently being implemented in Malawi to restore degraded farmlands. Conservation agriculture (CA) is defined as:

A farming system that promotes maintenance of a permanent soil cover, minimum soil disturbance (i.e. no tillage), and diversification of plant species. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and to improved and sustained crop production. (FAO 2019b)

CA has been scientifically proven to improve soil organic matter, thereby increasing productivity of the land. Despite its advantages, adoption is still quite low in the African region (Brown et al. 2017a). The high number of women involved in agricultural activity possess an opportunity for upscaling this intervention and consequently improve soil fertility as well as livelihoods. According to the Malawi Government (2017), restoration implemented with sensitivity to gender disparity can advance gender equality in addition to improving environmental conditions and functionality of any ecosystem. Therefore, promoting of CA should ensure that women are appropriately equipped to participate. One of the most important factors that could potentially raise the productivity of smallholder agriculture amongst women is said to be improved control over land (Djurfeldt et al. 2018).

In Malawi, the social and economic household characteristics are highly dependent on the culture of the area. The country is mostly governed by customary law and is divided by matrilineal and patrilineal lineage. The latter means that land is inherited through the man and the former means that land is inherited through the woman. According to FAO (2019c), customary law allows men to have a superior position over women and gives them power in family leadership and land holding. This results in a system of land ownership and rights that primarily favours men (Djurfeldt et al. 2018). While most of the ethnic groups in the country follow the matrilineal tenure, which means that women are more entitled to land, this does not result in women having control over the land (Djurfeldt et al. 2018). Complexities around land rights create limited conditions for women to upscale CA. Most farmers are not willing to invest conservation activities on land that could potentially be taken away from them.

Despite the challenges, empowerment of youth, women and vulnerable groups in agriculture is one of the policy priority areas of the national agricultural policy of Malawi (Malawi government 2016), and gender has been of pivotal importance in previous versions of the national agricultural policy. FAO (2011) states that “closing the gender gap in agriculture will benefit women, the agriculture and rural sectors, and society as a whole” (p. 5). This project feeds into the national agenda on gender, which focuses on eight priority areas, two of which are food and nutrition security and natural resources and the environment. This research aims to influence women’s involvement in CA in Malawi. Information collected could contribute to changes in the implementation of CA interventions, thereby contributing to Sustainable Development Goal (SDG) 15 *Life on land* and mainstream gender equity priorities in line with SDG 5 *Gender equality*. This study operationalises the term gender as the different responsibilities of men and women in the household and community.

1.2 Study Objectives

The main objective was:

- To understand the relationship between women farmer needs and successful adoption of conservation agriculture in Malawi.

The key research questions for this study were:

- How is the gender division of work and sharing of agricultural benefits in the household?
- What are the main challenges faced by women farmers that inhibit the adoption and practice of conservation agriculture?
- How can women’s participation in conservation agriculture be facilitated?

2. LITERATURE REVIEW

Women in Malawi provide 60 to 80 percent of the labour in agricultural activities (UN 2015). Despite women’s contribution to the agricultural sector, their contribution is challenged by a gender gap that has increased over time due to vulnerabilities that exist among women farmers which limit access to resources and reduce productivity (Huyer 2016). In Malawi, the gender gap in agriculture was stated in 2015 to be at \$100 million (UN Women, UNDP, UNEP, World Bank 2015) which, if addressed, could result in an increase in national income. Malawi ranks low on the global gender index and has performed well below average in championing women’s involvement and reducing the gender gap (World Economic Forum 2018). For female farmers, these current and existing gender inequalities are further intensified by the impacts of climate change, which include biodiversity loss as well as reduced availability of productive land and natural resources. This eventually threatens the well-being of not just women but whole communities (UNEP 2016).

Conservation agriculture is proven to be one of the climate smart technologies that helps to increase crop production in the face of climate change. It is stated to have multiple benefits, one of which is helping farmers cope with the reduction of rainfall by increasing soil water retention (Beuchelt & Badstue 2013). Despite the benefits only 0.3% of farmers in Africa practice CA (Brown et al. 2018), and most of them are men. Overall dis-adoption may be attributed to the amount of time it takes for CA benefits to be observed. CA results can only be seen after consistent use of the technology over time. This barrier causes farmers to dis-adopt CA before

they can realise the benefits of the technology (Ward et al. 2018). It is argued that CA is more likely to be adopted by men who are better off economically than poor smallholder farmers who are most often women (Wekesah et al. 2019). Furthermore, because women are responsible for household duties it is harder for female headed farm households to have enough labour for agriculture. In such cases women opt to reduce incoming generating activities outside their own farm (Huyer 2016). In addition to that, women are less likely to take up practice of community-based climate adaptation initiatives due to time constraints and may reject practices that increase their labour burden (Jost et al. 2016). In most cases within sub-Saharan Africa, adoption is higher in male-headed households with women perceived as a free labour source (Ward et al. 2018).

Even though the benefit of CA is perceived to be positive by women in sub-Saharan Africa, dis-adoption occurs due to intra-household gender dynamics. Commonly it is the man in the household that makes the decision to implement a practice or not, regardless of the woman's positive stance (Brown et al. 2017b). Evidence shows that decision-making power is a hindrance to female farmers in adoption of CA. In Malawi, the decision to adopt CA sometimes involves women, but in most occasions, they are excluded (Wekesah et al. 2019). Studies have also found that in addition to time constraints and lack of power over resources such as land and finances, lack of access to information and extension services can hinder women from adopting adaptive practices (Jost et al. 2015).

Priorities and actions in the SDG 5, on gender equality, are based on the premise that the role that women play within households cannot be set aside (United Nations, 2019). Instead it must be harmonized with efforts to increase female engagement. A study conducted by Mudege et al. (2017), concluded that efforts must be deliberately made to include women and must not overlook underpinning power dynamics within the household. It is important to remember, as Beuchelt and Badstue (2013) have stated, that

Global or overall effects of a technology are often positive, but the resulting benefits may be shared in different ways by different groups, for example between women and men. In the worst case, interventions may even increase gender and social disparities. (p. 718)

It requires more than eliminating constraints in equal access to resources and information to address gender inequalities in agriculture (Huyer 2016). In addition to equal access to training and agriculture information, efforts must challenge backward ideas about femininity that portray women as ignorant, passive, illiterate and a source of cheap labour (Mudege et al. 2017). While CA proves to benefit farmers, little research has been done to understand how gender relations interact with its adoption (Wekesah et al. 2019). Beuchelt and Badstue (2013) have further stated that “Although women play a key role in agriculture worldwide, cropping and farming system research and development have paid little attention to gender issues so far” (p. 713). But according to recent research CA has been shown to have the potential to positively impact gender issues at household level in favour of women by increasing their incomes and decision-making power (Wekesah et al. 2019). In order to encourage growth and adoption of a technology as well as enhance its positive impacts, approaches that are holistic and gender transformative within the farming and food system must be considered (Beuchelt & Badstue 2013).

3. METHODS

3.1 Study Area

This study was conducted in the Mwansambo extension planning area (EPA), within the Nkhokota district which is two and a half hours' drive from the capital Lilongwe (see Figure 1 below). According to the preliminary findings of the Malawi population and housing census of 2018, the area has a total population of 29,245, with the male population being 14,289, and females 14,956 (National Statistical Office of Malawi 2018). The total area of the EPA is 28,839 ha with 7,574 ha of arable land, 9,274 ha of nonarable land area and 2,432 of wetlands or peat land (Mussa et al. 2017). According to Bwanausi and Adolf (2018), the average land holding size in the area is between 0.4 to 0.6 hectares. The crops that are predominantly grown are maize and groundnuts. Maize is a staple food of the area and groundnuts are grown as a cash crop. Conservation agriculture has been practiced in Mwansambo for over 10 years now and this area was selected for the study based on the prevalence of CA. Participants were sampled from two villages, Chikango village, which is located 15 km away from the EPA's main trading centre, and Mgombe village, located only about 5 km from the trading centre (Bwanausi & Adolf 2018).

3.2 Data Collection

Data was collected using qualitative research methods. Qualitative research at its core is about capturing social or psychological aspects of the world and it deals with the meanings people have about various issues (Braune & Clarke 2014). Qualitative research was selected because this methodology gives more detail from a small sample. Data collection was carried out by four research assistants, two men and two women, who had previous experience of working in the area. The following methods were used: (i) focus group discussions and (ii) in-depth interviews. Pre-existing data on women in CA activities in the area was used for selective sampling and baseline information on the area and farmers. Demographic data was extracted from publicly available information.

3.2.1 Focus group discussions

By using the method of focus group discussions (FGDs) it was possible to collect data from multiple participants at the same time. This was assumed to be ideal due to the time and funding constraints of this study. FGDs provide a supportive and comfortable environment in which participants can talk in-depth (Braune & Clarke 2014). This method was used to give women a supportive space to communicate their thoughts and ideas. Three focus group discussions with women were conducted. Each group had between eight and 11 farmers and the groups were divided as follows:

- Group of female farmers practicing CA aged above 30
- Group of female farmers practicing CA aged below 30
- Group of female farmers not practicing CA



Figure 1: Map of Mwansambo area in Malawi. (Source: Limuwa et al. 2018).

Based on whether they practiced CA or did not practice CA, participants were selected for the three focus group discussions. Participants were also separated by age on the assumption that younger women would feel more comfortable speaking around those within a similar age range. The comfort of younger farmers in a group discussion may be affected by age based on social hierarchies, common in the area. Similarly, those practicing CA were separated from those not practicing CA. The assumption was made that women not practicing CA would be more open and forward with responses amongst those in a similar situation. Sampling also included women heading households to establish a difference between needs of women in female-headed households and male-headed households. A field extension officer working in the area was recruited to mobilise participants in FGDs and they were selected depending on their availability and willingness to participate. Participants were informed that they were free to leave the group at any time if they felt uncomfortable and that everything that was discussed would be used only for the purpose of the study. A guide was used to help the assistants facilitate the discussion (see Appendix I). Two assistants were assigned to each group, with one asking

questions and the other taking notes. The average time of the FGDs was just over an hour. All focus group discussions were recorded.

3.2.2 Key informant interviews

An interview guide was used to collect information from a small select group as key informants for the whole community. These key informants were selected based on their knowledge of the area and current interventions in agriculture. This method was selected based on the flexibility of the technique which allows for collection of significant amounts of information with in-depth details from a small sample (Braune & Clarke 2014). The following key informants were interviewed individually:

- ✓ **Traditional leaders:** One male and one female local leader from the area. Traditional leaders have an overall understanding of the local context and situation. This makes them essential informants for this study.
- ✓ **Agriculture Extension and Development Coordinator (AEDC):** The agricultural officer has an overall understanding of all agricultural activities in the area.
- ✓ **Agricultural Extension and Development Officer (AEDO):** These officers deal personally with farmers and understand potentials and challenges they face. One government officer was interviewed.
- ✓ **Environmental NGO Extension Officer:** One NGO field facilitator, from an NGO that is currently implementing CA practices in the area.
- ✓ **Lead farmer or model farmer in conservation agriculture:** One male and one female farmer were interviewed. These farmers have different types of training and are informally tasked to train or influence other farmers.

Meetings with key informants were booked with the assistance of the field facilitator or community extension worker in the area. Two research assistants were responsible for each meeting, with one interviewing and the other writing notes. It took an average of 45 minutes to complete an interview, using a semi-structured guide (see appendix II). All interviews were recorded.

In total 35 people were interviewed for the purpose of this study, 28 women farmers in focus group discussions and seven key informants.

3.3 Analysis

3.3.1 Transcription and thematic analysis

All recorded data was transcribed in the local language, Chichewa, by the researcher and research assistants. It took an average of half a day to complete a transcript. The researcher listened through all recordings and translated direct quotes used in results. All transcripts were coded and organised into themes. Complete coding was used for all data, to identify everything of interest to the objectives of the study.

A thematic analysis approach is a method of identifying themes and patterns of meaning across a data set in relation to the research objectives (Braune & Clarke, 2014). Two aspects of this analysis were considered, one was the experiential aspect which focuses on interpreting the results based on the participants standpoint. The second part was theoretical and therefore

guided by existing theory and concepts, which means that results were discussed in relation to former research and selected theoretical approaches.

4. RESULTS

In this section an interpretation of the results is demonstrated according to the responses during the interviews and focus group discussions. In these findings FGDs stands for focus group discussions, *CA 30+* stands for women 30 years of age and practicing conservation agriculture (CA), *CA below 30* means women below 30 years practicing CA and *non-CA* means women not practicing CA. Direct quotes taken from interviews are presented in italics to illustrate the actual standpoint of the respondent.

4.1 Gender division of work and benefits within a farm household

4.1.1 A woman's typical day of work

At the beginning of the focus group discussions the women were asked to give a short account of their typical workday. There was no major difference in responses from the three focus groups of women farmers, who all emphasised the many domestic tasks women perform taking care of the house and family. This was said to be done in addition to the farm work. A woman in the FGD of *CA 30+* described well the domestic task of collecting water, bathing the children, cleaning the home and preparing meals for the family:

When we get up in the morning we usually draw the water and clean the home, but also we have to make sure that we get the children ready for school, prepare some breakfast, bathe them and make sure they are on their way to school. After that we go to the farm. After the farm we must start planning what the children will eat when they get home, and what will the husband eat since it is almost lunch time, so we need to start preparing that meal.

In the rural setting the women also need to collect wood for cooking and heating the bath water, as mentioned in the description of one woman in FGD of *non-CA*, of the many early morning domestic tasks:

When a woman wakes up in the morning, she cleans the home and surroundings, after that she lights a fire to boil water for bathing, after everyone has taken a bath, she prepares food for breakfast.

During the busiest time of the farming season women may have to go back to the field after preparing lunch:

After we are done with the household chores in the morning, we have to now go to the farm and work, we return right before lunch to prepare a meal and if there is still some work to be done, especially during the season, then after lunch we go back to the farm. (FGD Non-CA)

In the discussions it was expressed that when women wake up in the morning, they are responsible for all household chores before they leave to go to the farm. Upon finishing working on the farm, they are expected to come home and prepare lunch for the household. Some days,

they might be required to go back to the farm after lunch. This was most common among women not practicing CA as they seemed to have more work to do, especially in the beginning of the season.

4.1.2 Gender division of farm work

When discussing the gender division of farming work with women in FGDs, it was said that farm work is either shared equally between husband and wife, or in some cases the woman will do most of the farm work. It was implied that in some rare cases men would do most of the work and these were identified as “good men”. A woman in FGD CA 30+ claimed the farm work was equally split between men and women today, but women still take care of all work in the home:

When I look at the farming that is happening these days, I can say that there is no major difference between the work that men and women do on the farm, we all do the same work. Our days are just different because maybe the men don't go to draw water or clean the home or take care of the children or cook. But on the farm, we do the same work, whether harvesting we do it together with our husbands.

The older participants believed that nowadays work on the farm is split more equally and that they do the same amount of farm work as the men do. Women still highlighted the gender difference in work that needs to be done in the home. One of the women in FGD CA 30+, did not agree on equal division of farm work, especially during harvesting:

There are some men though who leave most of the work to the women, especially with harvesting, usually men say that this is a woman's job and they leave it to the woman.

This showed that in some household's women do most of the farm work on top of doing the housework.

A woman from FGD non-CA also voiced the difference in total working time between men and women, mentioning carrying firewood and fetching water for the husband's bath:

There is a difference in the amount of work that we do. The difference is that we do the same amount of work on the farm. The husband partitions the work to be done in a day and we work on it equally but coming back from the farm I as a woman will sometimes have to fetch and carry firewood on my head. When I get home, I must start the fire, cook food, draw water for the husband to bathe. So, we end up doing more work after all.

Even though they do the work equally on the farm, women still have the responsibility to go home and look after the household, children and husband, showing that work is not equally divided after all. Although it was not directly stated during discussions, it was clear that the women thought that this division of work was unfair because domestic tasks were an extra burden.

In the focus group discussions, domestic tasks were of more concern to women than farm work which was described as more equal. Some of the key informants, on the other hand, claimed

that women in general did more work than men in farming. The female lead farmer emphasised the variations among households:

If we look at working on the farm, there are some families that work the same amount for both men and women, but there are other households where most of the work is done by the woman.

This disclosed that the community had different types of households that handle farm work in different ways, with either the work shared equally or most of the work given to the women. The male lead farmer said that women did most of the work on farms and were more open to education regarding agriculture:

To be honest, women do most of the work on the farm. More than men. Mostly the men leave the farming to the women, and women usually understand more easily any technologies or programs that come to do with farming, so the women have more work.

This response went further to show that not only was most of the farm work done by women, but women were easier to train in agricultural activities. The female traditional leader agreed on most farm work in the area being done by women, as they are responsible for providing food for the home. The men were more occupied with some other business than working in the fields:

In this area, if you look at most households, it is the woman who takes up the most roles on the farm. The men are usually out doing other things, maybe businesses and maybe some are just running away from doing the work. So, you will find that a lot of women are always thinking of how to find food in the home, hence, they are forced to work more for the food.

Women who want to ensure food security in the home take up the burden of farming in cases where men are busy with other income generating activities. Key informant responses further characterised some men as simply lazy, thereby finding excuses to leave the farm work to women. One of the agricultural extension workers (AEDO) also said that the men occupied themselves with other things to avoid the farm work, so the women ended up doing most of the work:

Honestly, most of the work on the farm is done by the women. Usually when the work is busy, men will find other ways to keep themselves occupied so that they don't have to be involved in the farm work, so I can say that most of the farm work is done by women.

These answers indicate that women are responsible for most of the farm work in many households in the area. It was understood from responses that there are several reasons explaining why women are potentially doing most of the work. The women are highly concerned about farming because it is a means for them to find food for the household, hence why they take up the work. Women were also described as having a better understanding of interventions because they take time to learn it. The men on the other hand, would rather be involved in money-making ventures, or activities that bring cash in hand. In some cases, men are simply lazy and use excuses to avoid doing the work.

Division of tasks on the farm is furthermore characterised by cultural norms of gendered roles in farming. One participant from CA 30+ reported that some work was for women to do:

Yes this is true, and usually the work that men like to leave women is harvesting and sorting and processing of the harvest. They say that is a woman's job.

Tasks such as harvesting, and processing of the harvest are said to be a woman's work. Similarly, there was some work that was said to be the responsibility of the husband, such as application of herbicides and marking of planting stations. One woman in FGD CA below 30 emphasised that men lead in application of pesticides:

The main roles that men play usually is application of pesticides after we have planted. Men usually lead in this activity, but most of the other activities are done by women.

Another woman in the same group talked about most women having problems with making ridges:

Men also take lead in marking of ridges or planting stations. Most women have a problem in doing this, therefore men will usually do it.

This demonstrated that some tasks are seen as better fit for men than women, and it may be assumed that women may be incapable and lacking the skills or strength to complete the task. A key informant interview with an agricultural extension worker (AEDC) revealed that tasks such as planting, weeding and post-harvest handling was mainly done by women, while men perceive themselves as responsible for sourcing of inputs:

OK, when it comes work being done on the farm such as planting, weeding even harvesting and post-harvest handling, you'll find that women are at the forefront of these tasks. And in most cases men aren't really involved in the farming because they believe that they are responsible for sourcing input for the farming activities such as seed fertilizer and pesticides, thereby leaving the responsibility of farm activities for the women.

Men usually claim that they should be responsible for sourcing of resources so that women are left with doing the main farm work. This showed that some respondents thought that most of the farm work in the fields is left to the women, but not shared equally.

4.1.3 Unequal sharing of benefits from farming

Of the biggest concern to women, was the fact that men will always take control of selling the crop, and in most cases, women do not benefit much from the monetary gains. This was despite many informants having reported that women do much of the work. A woman in FGD Non-CA said women gained nothing from selling of groundnuts and soybeans, and that the men selling the crops just used the money as they please, sometimes to pay loans or drinking:

I can tell you that women benefit nothing personally from farming even though we contribute the same amount of work, all we really get is maybe some food to feed the children. When we look at other crops such as groundnuts and soybeans, women don't gain anything. Sometimes the men sell the crops and use them as they please,

even for drinking, and sometimes they take loans in the lean season and we don't even know what was done with the money. Come harvest time we just see people coming to get the groundnuts. So honestly, women don't benefit much.

This illustrated that women wanted to benefit more than food resources from the harvest. The women stated that they would sometimes want to buy a piece of clothing or some utensils for the house, but control of the husband of finances and products only afforded them food resources for the home. A woman from FGD CA below 30 also mentioned that men sometimes use the money in the “wrong” way and emphasised the women have no control over the harvest:

Women don't have any control over the harvest. The man decides what should be sold, how much and what should be done with the money and some men just use the money in the wrong way.

This indicates that women were not pleased with the use of the gains and even viewed the activities as wrong. Another woman in that group expressed a feeling of being side-lined on the issue of spending money from the selling of harvest and talked about women in the community having no power to speak against the husband:

... women are really facing these challenges in the community. Women have no power to speak against the husband and how he uses the money they gain from selling the crops. We really feel side-lined because we also do the work.

Responses gave the impression that this was a big issue and discussions with the women farmers showed that lack of control over resources made them feel left aside.

A woman in FGD CA 30+ also talked about the control of men over the sales of harvest, reporting that some men give women small portions of the benefits, but not enough when considering the work women put into farming:

There are others who will give women a small portion of the sales, but most times the men take control of everything and make our contribution to the work irrelevant. We can have a good harvest but maybe you need something you would have to find some other means to find the money.

Women felt that they do not benefit much from the farming even though they appeared to contribute the most. They felt this was a big challenge when it came to benefits of the farming activities. While they got little of the money, men had the chance to spend the money as they pleased, even on alcohol. This could be interpreted as men regarding women's contribution as free labour or even belittling the amount of work that women do. Because of this, women did not deserve a say on the money that was gained from cash crops. It was reported that if one has a “good husband” there may be room for discussion on what should be done with the money.

The key informant interviews told a similar story about the unequal sharing of the benefits from selling farm products. The NGO extension officer made a distinction between cash crops, which men controlled, and food crops for the home, which women usually controlled:

Most of the time the cash crops are usually controlled by the men, in this case groundnuts, and the crops that are food crops like maize are usually controlled by

the women. I can say that the decisions are shared, but usually if it involves gaining some money, men usually take up control.

The agricultural extension workers both talked about little power of women over the selling of crops and use of the benefits. The AEDC claimed some women had to “steal” some of the money from the husbands:

Usually the man has the most power over selling of the crop and spending of the money in most cases in this area. Women have very little decision-making power how the money should be spent, sometimes some women even go as far as maybe stealing a little bit from their husband just so that they can be able to use the money for something that they want. Sometimes, not all the time, but sometimes that can happen.

This displayed that in some cases women had to go to the extreme to get money from their husbands. The AEDO mentioned that discussions on gender issues influenced some men that now included their wives in the selling of crops:

Even though the women do all the work, the men take up the responsibility of selling the crop. Of course, there are others who have been taught about gender issues and have started to include women in selling of the crop, but there are not very many.

This illustrated that efforts made to make the community more gender aware had gradually started to work and some households had begun to follow the ideals of gender equality. A female local leader used the same expression as the women in the focus groups, about good and not good husbands. The no-good husbands neither gave money to women nor consulted on the use of the benefits from selling the harvest:

The man is the one who carries the crop to go and sell it. The woman is not given responsibility to handle the sales and even using the money. If the husband is not good, he will not give the woman any part of the money to use or will not at least discuss with the wife how the money should be used.

Women have limited control over what happens with the production of cash crops and what is done with the money when it is sold. The responsibility for selling was ultimately taken up by the husband as the head of the household and main decision maker in the home. However, from discussions it was clear that the women were not satisfied with this arrangement and would rather have a say in how financial gains were used.

4.2 Land rights and ownership

Land rights and land ownership in the area are reported to be guided by tradition and land is usually acquire through family inheritance. Women from the different focus group discussions described the various ways in which many of them have acquired the land that they use. A woman from the FGD non-CA said that the land that she is currently using was acquired from the chief when she moved into the area:

The land that I have I got from the chief and I also use it as I please, and sometimes we can buy from the community. But usually we get the land from the chief and from our parents.

This illustrated that land can either be inherited from parents or bought or given to a community member by the chief. Similarly, a woman from the CA 30+ FGD also reported that land is acquired from parents:

Most of us who are here, we can say that we inherited the land that we had from our parents. But sometimes the land is small, because the land is divided, so some people will purchase some more land within the area. A lot of people have bought extra land.

As reported, land is in most cases inherited from the family, but because this is never enough, a lot of people have had to buy additional land for household farming activities. A woman from the FGD CA below 30 said that in addition to buying land some farmers also opted for renting or leasing land:

We have small land sizes here in this community, usually your parents will give you a small portion of land when you start farming, so usually we must rent land from other farmers who have more land.

Due to small land sizes farmers had to rent from farmers who have more land. The majority of respondents agreed that land is acquired mainly through inheritance from parents by a household. If households can afford it, they either purchase additional land or lease some land for temporary use. There are also situations where the chief will give some land to people who come from other areas to stay in the community. A woman from the non-CA FGD clarified that the land given by the chief is, by definition, borrowed and cannot be sold by the one using it:

And even the land that is given by the chief, just to make a correction, the person cannot sell, because at any point the chief can reclaim the land for community development issues and give you land somewhere else.

The chief therefore still owns rights to that land and may at any time take back the land if needed.

On the other hand, land that was purchased belonged to the household and rights were decided by the household. A woman from CA 30+ suggested that land ownership may be agreed upon within the household when land is bought:

When buying land, you and your husband discuss who will have rights over the land, and usually the land is for the children, just like our parents gave us land, the land will go to our children.

This shows that the land is thought of as belonging to the children in the future, just as they inherited land from their parents.

From responses it was common that even though the land belongs to the woman by inheritance the man of the household will still make all decisions pertaining to the land. A woman from the non-CA FGD reported:

Sometimes the land is given to us by our parents, but when the husband comes, or we start a family we give the power over the land to the man.

If the land is inherited from parents of the woman, then it belongs to the woman, and to the man if inherited from his parents. Despite of who the land belongs to, the man of the household makes all decisions pertaining to the land. This was confirmed by the extension officer of the area:

The rights are determined by how the land was acquired, if it belongs to the women's family or man's, but the man still makes the decisions about the land regardless.

A key informant interview with the NGO extension officer also revealed that most women have very little power in decisions made on land even if it belongs to them:

This is a Chewa-based tradition. Most men go to the woman's home and the land in that scenario belongs to the woman's family, and that is where the man is farming, but the decisions being made on the farm are done by the husband.

Tradition plays a part in the acquiring and use of land. A key informant interview with AEDC also indicated that men have the most power when it came to land issues:

As you know, this is not just here in Mwansambo, generally in Malawi culture plays a big role in society, and when it comes to the issue of land ownership men have more power than women when it comes to owning land. Of course, this is different if the family is staying on land that belongs to the woman's family, then maybe the woman has a little bit of power over the land. But mostly men have more power over land.

Even though women may be allowed to make suggestions, they will eventually do what the husband agrees to or sees fit. This is because culture plays a big role in decision making in farming. Although the land belongs to the women in the Chewa tradition, where the man goes to live with the woman's family, the man still has power over the decisions that are made in the household and on that piece of land. There are some cases where women might have some influence on decision making when it comes to land use, but overall men hold the power. Despite the man's decision-making power over land use and activities, it doesn't give him ownership rights to the land. A woman from non-CA FGD reported that the man cannot in fact sell the land:

He cannot sell the land. The land belongs to my family, but if it comes from his family then he would be able to sell the land, or if the land was given to both of us by the chief then maybe he could be able to sell the land.

The side of the family that the land was inherited from has the ownership right over the land. Only they would be able to make the decision to sell the land. If the land belongs to the woman's family, then the man cannot sell it. If the land was acquired through the chief of the area, then that land belongs to the community because it may be reclaimed at any point for community development purposes. In most cases bought land is later divided amongst the children.

4.3 Conservation agriculture practices and adoption

4.3.1 Understanding of the principles of conservation agriculture

Various descriptions and understanding of the concept of CA were provide by women farmers in the FGDs. A woman from non-CA FGD understood CA as crop residue retention and the use of herbicides:

From what we hear, CA is that they leave the crop residue on the farm, when the rains come, they plant, and they must have herbicides and pesticides to spray the farm too. That is what I have heard.

This showed that those women who were not participating in the practice only viewed CA as the use of crop residues for mulching and the use of pesticides and herbicides on the farm. A woman from the FGD CA 30+ on the other hand described CA as a farming method that aims for minimum disturbance of the soil:

This is the type of farming where you try as much as possible not to disturb the land and it is very good for the land in the periods were the weather is changing and we have long periods of no rain.

It could be observed from responses that CA is more understood in the lines of tillage of the soil. It is required that the soil be left undisturbed and that this could have positive effects in times of drought or lack of rainfall. A woman in the below 30 FGD reported CA to be about crop residue retention:

CA is a way of farming that helps to increase fertility of the soil. We leave crop residues from the previous season, which work as a mulch and a source of manure. Because of this mulch, when the rains stop before time, or when we get dry spells, the crop doesn't die because the mulch helps the soil to keep water.

Other women in the same group added to this description that CA meant not tilling but use of manure:

We also do not till the soil, so we don't make ridges ... We should also not forget that we also use manure.

These responses showed that the overall understanding of the practice included the use of crop residues for mulching, minimum tillage and application of manure. Responses also showed that younger women farmers had a better understanding of the combination of practices under CA. Women not practicing CA also understood some of the practices that were done under the intervention. Even though results showed that that they seemed to have partial understanding individually, collectively the groups of women were able to give an almost accurate definition of CA. It should be noted though that the women in FGDs did not clearly mention crop rotation as one of the practices done under CA in the area, which is the third principle of CA in the definition used for this study.

4.3.2 Conservation agriculture adoption in Mwansambo

In addition to CA descriptions given by women, key informants were asked to give a brief history of CA in the area especially in terms of adoption over time. Interviews revealed that CA has been practiced in the area for a little over 10 years. Even though the practice was not popular in the beginning there has been a significant increase in CA adoption in the area in recent times. Women were said to dominate the practice at the time of the interviews. A male lead farmer reported that women were playing a great role in CA:

Women are really paying a big role in CA. If we can just walk through the community, we would be able to see that women are the ones who are working the hardest at CA.

This response showed that women in the community did most of the CA work. The AEDO agreed with this and went further to say that men are more interested in other money-making activities:

I can say that it is female farmers that are adopting conservation agriculture more in my area. You know a lot of men are more interested in businesses other than farming, therefore most of the farming is left to the woman.

The influential role of women in the adoption of CA in the Mwansambo area was mainly attributed to the fact that women do most of the farm work and therefore practice CA more than men. The AEDC also suggested that women have more to benefit from the practice and therefore find it appealing:

I can say that adoption is mostly by women in this area. If we consider the benefits of CA, if we look at the different groups of farmers that we currently have and are working with, women groups and men groups, women are the ones who are adopting the technology more. Because women, if we look at our culture, do a lot of work, they have to think about looking after the household and then also looking after the farm and when they see that with CA they are able to reduce the amount of work they have to put in the farm then it becomes more appealing to them.

This disclosed that CA became a more appealing method to women because it gave them benefits such as reducing the amount of time that they spent on farming. Even though respondents reported that women played a pivotal role, others claimed that it was the men that played the main role and that women's contribution was dependent on the presence of a male within the household. The male local leader claimed that it was men who were adopting CA more in the area:

The households that mostly adopt CA are those which have both the man and woman in the home, but it is mostly men who are adopting CA more than women. When it first came it was mostly young people who adopted, but now almost everyone is doing it, but the majority are men.

Apart from men in general, this local leader also mentioned young farmers as main adopters of CA. The NGO extension officer clarified some more and said that mostly women coming from households that were male headed, adopted the technology more:

CA is highly adopted by households that are male headed, for a woman who is alone to take the risk, it is less likely, and it usually requires that a man should be there to lead them into the practice. This doesn't mean that they can't do it, it just that they require the security of the man when they start, but once they feel confident enough, even if the man is not there, they still do very well.

The NGO extension worker expressed the view that women may not have the confidence to adopt the technology on their own and therefore need the man to support them, especially in the beginning. This suggested that women farmers would only adopt the practice with the approval of and guidance from their husbands. The CA adoption was more common in households headed by men, but the majority of those practicing it were women. This was also evident from interviews that were conducted with the female local leader and lead farmer, who gave similar responses.

It could be understood from these responses that few female-headed households adopted the technology in the area, but it was mentioned that some female-headed households had done well in CA, though very few. According to the male lead farmer it is at times easier to train women:

As a lead farmer and community extension worker, when we are teaching farmers, I can say that we have noticed with experience that women usually grasp concepts more easily and faster than men, and women are usually more interested. Men usually just want to reap the benefits of the practices and start to take part when they see results.

Women were perceived to understand concepts in training much more easily than men. It should be noted though that women are readily available at farming plots as men are more interested in income-generating activities. Women are also more interested in interventions that may result in food security attainment for the household.

4.4 Conservation agriculture benefits and challenges

4.4.1 Benefits of conservation agriculture

Various benefits of CA were reported during interviews and focus group discussions. The more obvious benefits were stated as increased soil fertility, increased soil water retention, reduced soil erosion and increased yield. Benefits of the practice were perceived similarly among different groups of women farmers in FGDs. All the women understood the main benefits of CA and reported to have seen and experienced these benefits. Even the women who were not at the time practicing CA said that they could see the importance of the practice. The women reported that since practicing CA, the soil could hold more water and that farmers have managed to increase their harvest because the soil is more fertile. They also said that it had reduced loss of soil through soil erosion. A woman from the non-CA FGD said that she had noticed that the farms of those practicing CA experienced less soil loss:

The one benefit that I have noticed and that has made me want to also join the practice is that when heavy rains come the water does not carry the soil away, sometimes even the fertilizers that we have applied, which is bad, but we can see that on our friends' farm that this is not the case.

Soil erosion which had also led to loss of nutrients was no longer a problem due to the practice of CA. The woman who at the time did not practice CA could notice that the farms were different in terms of soil quality. Women from CA 30+ and CA below 30 agreed that they were experiencing a positive change in soil properties just as had been noticed by those not practicing CA.

Interesting to note was that women's responses also suggested some benefits that were specific to only female farmers. Women, including those who did not practice CA, agreed that women have benefited from CA in that it has helped reduce the amount of work. A woman from the non-CA FGD reported that those practicing CA had more time to do other things:

As for us, who don't practice CA, we have more work to do, honestly, while our friends have more time to do other things, even small businesses.

This showed that women who were practicing CA had more time off farm work unlike those that were not practicing CA. This gave them more time to invest in small businesses. A woman from the FGD CA below 30 reported that before they started practicing CA they would have to work in the morning and in the afternoon:

Honestly as women we have less work now than we had before. We had to do a lot of work in the morning and then come home and do all the work at home, then we would have to go back to the farm for some more work in the afternoon.

This left them with little time to do other things due to the farming workload. Similarly, a woman from the CA 30+ FGD said that not only did women have more time but now they had more energy, because before they would usually work to exhaustion:

We are now stronger and more energised. Before we had to work to exhaustion, we didn't have time to do other things, even to rest. Now we have time to rest, spend time with our children, see to businesses. Before we would even go twice to the farm in the morning and after lunch we would have to go back to the farm.

Now women were less tired, had time to rest, and that they could take time to pay attention to their children and household. CA was said to have relieved women of some of the burdens of conventional farming such as making ridges. Women said they had extra time to invest in themselves as well as in community development. The intervention also gave them time to get involved in other income-generating activities.

4.4.2 Challenges of conservation agriculture

Despite the benefits, participants in FGDs reported facing some challenges when it comes to CA practices. Most of the challenges were general to the community such as fires that are brought about by mice hunters during the dry season. It was said that these fires, together with grazing animals that are not minded, can cause damage to the crop residues. Local leaders said that bylaws had been passed to make sure that those that deliberately did this were fined. Key informant interviews with the extension workers on the other hand pointed out some challenges that were not highlighted in the FGDs when discussing CA practice. The AEDC reported that small land holdings in the area are a major challenge to crop rotation:

I think the biggest challenge I have already spoken of is the limitation of farming land. Like I said, the sizes of most families land is very small and you know, conservation agriculture, it requires crop rotation, which means that if a farmer has grown maize in the plot this year, next year they are required to grow another crop, most likely a legume such as groundnuts or soya beans. This brings about a big challenge. Imagine a farmer who has one acre of land, for him or her to be able to divide the land and practice crop rotation. It's a little bit difficult.

The interview revealed that small landholdings affected the effective practice of CA as it usually resulted in farmers having trouble practicing crop rotation as part of CA. This principle requires the farmer to rotate the crops he or she grows on the land and is impossible when the land is too small. This makes the practice difficult for them. The interview with the AEDO revealed similar sentiments:

I can say that there are no major challenges for farmers, it's just that the challenge that I see is that farmers have small land holding sizes, so it is hard for people to practice crop rotation because they cannot divide the land and they cannot rotate the crops. This is the biggest challenge that I can see, and women are the most vulnerable to the issue of small land sizes. Most female-headed households have small amounts of land in general.

This response further showed that the majority of women-headed households have very little farming land. Due to limited land rights, women may be unable to adopt CA effectively. Women who are on their own might also be unable to rent additional land to expand farming activities because of economic vulnerability.

All the women farmers agreed that one of the biggest challenges they were facing was that the husbands always leave the work of carrying crop residues to the farm to them. This response was common among the women. The woman lead farmer also claimed that women faced labour challenges in moving residue from one farm to the other:

For women it is usually the lack of labour, because sometimes you need manpower to move residue to another farm, and as well as during weeding.

This showed that women faced some labour challenges in practicing CA. Labour was most required when moving crop residue between plots and when weeding. One of the women from FGD CA 30+ reported that men usually leave these jobs to them:

... and usually the men leave us alone to carry the residues to the farm while they just wait for you at the farm to lay down the mulch. This is also a big challenge for us women.

Men did not usually take part in moving the residue, this work was left to women. Women reported facing several difficulties including carrying the residues a long distance as well as finding snakes in the residues.

This was a common challenge amongst the women and many of them implied that this was the biggest challenge that they faced when it came to practicing CA. When asked about this challenge, extension workers, however, confirmed that this practice of moving residues between plots was in fact wrong. Responses went on to highlight that misunderstanding of CA

concepts or practices was another challenge that was being faced. The NGO extension worker said that such misunderstanding was common:

This is the kind of misunderstanding I was talking about. In CA we don't encourage moving residue to a different plot. We tell them to leave everything after harvest on the plot and grow a different crop afterwards, so as you can see, they are giving themselves work that they shouldn't be doing.

According to this response women should not in fact be moving crop residue from one farm to another and that this was ultimately a challenge that could easily be eliminated if they understood better. But this could be attributed to the fact that some farmers used rented land as stated earlier and therefore had to move the residue from the rented land to their own land after the season was over or the lease had ended. Due to the temporality of use of rented land, farmers are not usually willing to make soil conservation investments on borrowed land. Overall the women communicated that the challenge was that the men left the majority of the work to them. As stated by a woman from the FGD CA below 30:

I think the biggest challenge is when men leave the work to us to do alone, even things like spraying of the herbicides, which is hard for us women.

The women felt that most of the work was left to them, and key informant interviews revealed that this was a challenge for women practicing CA. According to this response from the man lead farmer, this was attributed to women understanding the practice better and being available for training:

But women have more challenges, when they commit themselves to the work and they do most of the work because they understand it better. Usually men will be away doing other things and find the major work already done.

This meant that men would usually be busy with other things leaving the women with all the work.

Another major challenge was access to inputs for women, especially herbicides. Women not practicing CA agreed that they were unable to start due to lack of inputs. Herbicides were reported to be essential to the practice as it was said to be hard to weed the plot with mulch on it. A woman from the non-CA FGD reported that she had at one point decided to start practicing CA:

As for me, last time I tried to do CA but when it came time to plant I did not have the money to buy spraying chemicals. Therefore I just started over and made ridges.

This woman farmer opted out of using CA when she could not purchase herbicides. The woman local leader agreed that the biggest challenge faced was lack of herbicides:

I feel that the biggest challenge is that when you don't have enough herbicides or even can't afford to buy them at all, then it is really hard and time consuming to do the weeding. But if you apply the herbicide properly then it is not a problem.

Herbicides were said to be essential for the practice of CA because manual weeding was near impossible to do on the farm due to the mulch layer. The importance of having these herbicides

for weed control during CA practices was stressed and, in some cases, women reported to have failed to continue with the practice because of lack of access to these inputs. Women who were not practicing CA saw this as a challenge that only they faced and went on to state that they believed that women who were already practicing CA had no challenges. A woman from the non-CA FGD reported:

Yes, we don't see any problems that they are facing. It is us who would like to start practicing but we don't have the necessary inputs to be able to practice CA.

They viewed the practice as one that only gave benefits and that if only someone could help them to start, they would have no challenges either.

4.5 Conservation agriculture support and upscaling efforts among women

Participants stated that farmers have received various forms of support from different NGOs and even from the government. Some farmers had received farm inputs which included fertilizer, herbicides and seed. A majority of the participants said that these inputs were only given to a few farmers who established demonstration plots used for training other farmers. Women not practicing CA, however, believed that all farmers practicing CA were provided with these inputs. In addition to the inputs, some farmers were also given livestock, and all farmers were entitled to receive some form of training and extension services. All inputs were a one-off type of support, but training and extension services are ongoing. These services were provided by NGOs working in the area and the government.

FGD participants reported that there has not been any support for CA that was specific for only women. Responses from key informants gave similar results; that no support had been given only for women in CA. The AEDC, however, reported that there were deliberate efforts to include women in activities:

We have made sure that when extension workers are doing their job, they must make sure not to sideline women. They must make sure that women are given some responsibility, whether in committees and groups as well as hosting demonstration plots. We also ask them to highlight to the community the importance of women farmers, and the roles that they play in agriculture.

Extension officers were instructed to deliberately increase the role played by women in community interventions. This meant that women could potentially hold positions on committees as well as lead-farmer positions. Participants said that it was motivating to women farmers when they saw fellow women doing well or holding important positions in the community. Women themselves have gone any extra mile to show their capabilities. One of the women practicing CA 30+ said that women work hard so that their dedication and capabilities could be seen and supported:

I think that for us women, we have learnt CA and are really working hard to do the work willingly. We haven't had thoughts to seek for support because we wouldn't know where to go, but we assume that the way we are working hard if some other organisations can see that we are serious and really want to do this, then maybe they can support us some more.

The women believed that if they work hard and have something to show for their work then it would be easier for other people to notice them and to recognize their efforts. This was the main action that was said to be taken by women to gain support from organizations. It was assumed that hard work is what they had to show to attract more support from the organizations.

No form of support has been deliberately directed specially to women, but it was clear from responses that they required targeted assistance for them to upscale CA. Most respondents reported that some support with inputs was what women need the most. The woman local leader said that if women were given inputs such as fertilizer and herbicide, adoption of CA would be encouraged:

I think that if women were given inputs, especially fertilizer and herbicides, then women would be able to be encouraged to practice CA. A lot of women are being discouraged because they feel that they don't have the necessary inputs, so if these things can be provided to them it would be really good.

Illustrated in this response was that women were in many cases discouraged to adopt CA because they did not have access to the necessary inputs. This concurred with the formerly mentioned farmer not practicing CA who failed to continue the practice when she could not access herbicides. In addition to this, women said that they needed a source of income outside farming which could act as a source of resources for input purchase. A woman from the FGD CA below 30 said that if they had an organisation that could provide them with business capital this would help:

I think if we had an organization that would help us with a small business capital, so that from that business we are able to find some money to buy inputs, especially herbicides. It would be easier for us in the homes, if we had our own source of income.

If women were more economically independent this would give them the power to purchase inputs which would go a long way in promoting any agricultural practice amongst them. Even women who were not practicing CA agreed that if they were provided with fertilizers, herbicides, seed and other inputs they would be able to successfully practice CA.

In addition to these forms of support, key informant interviews also suggested more training and awareness creation for female farmers on CA. The NGO extension worker reported that it was important to empower women through various forms of training like record keeping:

I think record keeping is one of the ways to empower women, when they are able to know how much they invest and how much they harvest, they will be able to see over the year how their harvest is improving by CA. A lot of the things that they complain about, like buying fertilizer, if only they took the time to calculate the costs and benefits, they would see that it is really a small price to pay.

Record keeping would help women understand what they need to invest and the benefits they reap from the investment. This would show them that the benefits outweigh the costs, which is important in upscaling CA. This suggestion was made to address the common problem of dis-adoption which comes about because farmers often do not see the benefits that they get from a small cost. The AEDO also reported that more training is required to increase the knowledge of women in CA:

I think they need more support in understanding the practices of CA. Like I said, in the past some people stopped practicing after incentives were cut off, but you can see now that even more people have started using it because they have seen the benefits they reap. So, more sensitization and training are needed.

Women still needed an even better understanding of the practice and that would help in increasing CA adoption. Respondents claimed that women required more training because they were still experiencing some challenges with understanding the practice of CA. Additionally, dis-adoption by women was said to be driven by lack of knowledge of the practice and its real benefits.

5. DISCUSSION

The main objective of the study was to understand the relationship between female farmer needs and successful adoption of conservation agriculture (CA) in Malawi. This section discusses the main findings in relation to other studies. Findings and arguments are structured to answer the research questions.

5.1 Research question 1

How is the gender division of work and sharing of agricultural benefits in the household?

The findings indicate that women play a crucial role in domestic and farm activities. It is interesting to note that women in the focus group discussions claimed that the gender division of work was more equal now than it had been in the past. In some cases, the workload of women was illustrated to be greater than that of men within the households. Key informants interviewed, on the other hand, claimed that women do more of the farm work. All agreed that women have additional work burdens emerging from domestic responsibilities. A study from FAO (2011) showed that this is an illustration of labour division within a typical farming household, where women farmers' total labour burden is increased by unpaid household responsibilities. The conclusion was that women are the major source of farm labour in Africa, but labour divisions may vary by other factors like social status, age and local traditions, creating regional and national variations.

Despite imbalances in the gendered division of work between men and women, women reported that there are some tasks that they themselves rely on men to do. Tasks such as herbicide application and ridge marking are ultimately left to men. According to Nyanga et al. (2012), herbicide application is a fundamental practice in CA, which helps reduce the labour burden for women, as manual weeding is considered a woman's task (Wekesah et al. 2019). Other research has reported that women have difficulty with the use and application of herbicides. In many cases they have no knowledge of how to use the sprayer and the amounts to use, and in some cases the sprayer was too heavy for them to carry (Farnworth et al. 2015). This explains why men are typically left with this task. According to the findings of this study, women believed that it is the responsibility of men to provide farm inputs such as fertilizer and seed, even though they agreed that the men did not actually provide inputs for household farming in most homes.

Despite women's contribution to the farming activities in the study area they have very little say on how the gains from sales of produce are used. In most cases men decided how much of the produce should be sold and how the money should be used. It is important to understand

that even though adoption of practices such as CA may increase yield for women farmers, the increased benefits are not usually shared equally between the husband and the wife. Men at times reap the benefits individually with no contribution made to improvement in the household (World Bank 2009). This eventually affects the welfare of the household. According to Djurfeldt et al. (2018), the efforts and resources of the woman are usually tied to the welfare of the household as women are concerned with the home, food security and children's wellbeing, unlike the men's priorities (Quisumbing 2003; Meinzen-Dick et al. 2010).

Irrespective of the gender division of farm work, this study showed that decision-making power is solely left to men in most cases. Some reported that decisions may be discussed within the household, but the general view was that the man is responsible for all the decisions within a farming household. Beuchelt and Badstue (2013) also found that decision making concerning farm activities is in most cases not shared equally between husband and wife, and that men take the lead in making decisions, especially about the use of assets such as land. Despite the land being acquired through the woman's family, the man will still make all the decisions on the land as the head of the household.

Doss (2001) argues that African households are highly complex and usually diverse when it comes to handling of gender sensitive issues such as decision making. Women interviewed in Mwanambo did not agree on how decisions were made within farming households in the area. It was a popular view that once one has a "good man" then decisions are consequently made differently within the household. Men are essentially viewed as the head of the household, meaning that all decisions must be approved or taken by them. This is typical of a Malawian social cultural set-up where local production systems accentuate male household headship (Djurfeldt et al. 2018). The findings of this study showed that the women were not particularly happy with this arrangement and would want to have more decision-making power. Women in most cases felt that men took control of selling the products but left the hard work of farming to them. It is important to employ gender transformative approaches to break down gender norms and power imbalances in order to foster reduction of gender disparities within household relationships (Beuchelt & Badstue 2013). This can ultimately increase the benefits gained by women farmers from their agricultural work.

5.2 Research question 2

What are the main challenges faced by women farmers that inhibit the adoption and practice of CA?

The main challenges of women farmers were centred around availability of inputs and resources such as land. Both women practicing CA and those not practicing CA stated that practice and adoption could be improved if only they had the right inputs, the right inputs being identified as fertilizer, seed and herbicides. Like these findings, a study by Chisenga (2015) reported that women from Malawi were unable to practice CA because of lack of access to resources such as inputs, land and training. Research has shown that women farmers' access to inputs increases success in adoption of agricultural technologies (Chisenga 2015). Wetengere (2010) has further confirmed that inadequate access to resources, in this case money, that enables purchase of inputs is viewed as a major constraint to CA adoption.

This challenge is further enhanced by the lack of decision-making power of women over financial and land resources within the household. Studies have found that women who feel less secure about the situation of land rights within a household tend to avoid adoption of CA

(Beuchelt & Badstue 2013). This point, however, did not clearly stand out from the results of this study, but it could be assumed that some women were afraid to adopt CA because once productivity increases, men may take over the practice. Small land holding sizes, however, were a challenge amongst most households in the area, and in most cases, farmers rent additional land. This makes them more reluctant to invest in soil conservation technologies on land that does not belong to them. Studies have shown that short term tenancy (renting of land) usually results in less investment in soil conservation methods (Lovo 2016). According to Beuchelt and Badstue (2013) land tenure is central to soil improvement incentives:

Land tenure is a key issue because of the significant and long-term investments in soil improvement. Where land tenure is uncertain farmers may be reluctant to adopt CA, because they risk losing their investment if the land is reallocated or reclaimed by others. (p.714)

It is therefore important that the household has clear rights to the land they are using. Lovo (2016) argues that ownership rights by themselves are not enough to ensure investment in conservation as ownership and use are viewed differently in Malawian culture. According to Djurfeldt et al. (2018), a combination of increasing household sizes, low yields in agriculture and limited farm sizes hinders poor farmers, mostly women, from attaining food security for their households. In this study, this challenge also directly affected the practice of one of the principles of CA, crop rotation, which requires that crops be rotated on a piece of land every new season.

The challenge of access to herbicides was also highlighted by the participants of the study. Women found that without herbicides, CA is not easy to practice because this means that a farmer must weed the field manually. Women farmers have in many cases failed to practice CA due to lack of herbicides. Farnworth et al. (2015) reported that use of herbicides gave more time to women, which agrees with the results from this study. While herbicide use is viewed as an important aspect of the practice, Wekesah et al. (2019) drew attention to health risks as “long-term herbicide use in CA is linked to cancers in women and low sperm count among men” (p. 89). According to a study carried out in Zambia, the use of herbicides resulted in the loss of indigenous vegetable plants that grow like weeds and are a source of food for households. This put additional pressure on women who are responsible for food sourcing within the household. It is possible that herbicide use in CA comes at a cost, despite benefits such as saving time and a larger harvest.

The results showed that women practicing CA and those not practicing CA faced similar challenges. In all three FGDs women stated that the biggest challenge was the unequal sharing of the work burden within the household. The challenge only differed in severity, with women not practicing CA having more work to do on the farm. Female farmers not practicing CA reported that they did not believe that women who were practicing CA were facing any kind of challenges and therefore were not in the same need for assistance as they were.

5.3 Research question 3

How can women’s participation in CA be facilitated?

The results of this study showed that efforts to make CA practice more gender sensitive need to be upscaled if women’s participation in CA is to be facilitated even further. The study has shown that women are more than willing to participate in CA but find themselves burdened by

work and limited by power dynamics within the household. A gender perspective is imperative for the successful adoption of many agricultural technologies. This entails emphasizing the fact that there are differences between men and women within a household when it comes to labour burdens, control over resources, access to information, even social interactions (CCAFS [Climate Change Agriculture and Food Security] & FAO 2012). Key informant interviews showed that they had made efforts to create awareness on gender issues within households, but the extent of the efforts was not highlighted well enough within the results. This is pivotal in ensuring successful integration of women in any agricultural activity. Gender approaches embedded in extension services allow families to become more aware of gender roles, and identifying effects and solutions, and have been proven successful in countries such as Zambia (Beuchelt & Badstue 2013).

While some households have embraced the importance of gender transformative approaches, others are still far from accepting this idea of living. Even more discouraging is that there has to date been no support, inputs and otherwise, that have deliberately been directed towards women farmers in CA. This is so even though results of this study showed that women make up the majority of the population practicing CA in the area and found the practice to be highly beneficial to them. Access to services such as loans that could aid women farmers in the purchase of inputs and other resources is important (Simtowe 2010), as suggested by participants in this study. In previous interventions farmers had received incentives in the form of seed and fertilizer for the purpose of CA, but most women participants thought that loans were a better alternative. They could use the money to invest in small businesses that could be a regular source of income, which they could use for inputs.

Extension workers suggested that women needed to be trained and sensitized more. Other informants claimed that women in the area were easier to train than men. Beuchelt and Badstue (2013) argued that because female farmers in southern Africa are usually disadvantaged in terms of education, it takes time for them to understand concepts of a technology and gain the necessary skill and knowledge. The study continues to highlight that extension activities should always consider that women may not be too comfortable voicing views, needs and opinions (Beuchelt & Badstue 2013). This could influence understanding of interventions as the women may not be comfortable enough to ask where they have not understood, or even request assistance from extension officers. According to Rogers (2003), adoption of an intervention is increased when people understand how to do it and see its eminent benefits. This means that lack of training and knowledge can potentially reduce adoption.

More efforts must be made to make sure that women understand the practice and are doing it the right way. The findings showed that women farmers have been moving crop residues between plots and this has created an extra workload for them. Extension workers clarified that this should not be done this way. It can be assumed, however, that these residues were moved from a plot rented the previous season, as the women said it was common to rent extra land in the area. Therefore, residues were transferred to the household's own plot for improving soils there. This explanation was not properly explored in this study and needs to be studied further.

6. CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNT

This study has shown that sociocultural norms play a great role in current gender disparity in farm work in Mwansambo, Malawi. Men are usually seen as the main decision makers in the household, therefore side-lining women. Even though women are said to be the major

contributors to the agricultural labour force in Mwanambwa, their contribution may not yield the benefits that they would like to achieve. Women have few personal benefits because they have limited control over the economic gains from crops. This study has shown that women are forced to carry the burden due to limited decision-making power. Limitations in time and resources make it hard for them to engage in agricultural interventions as well as income generating activities. Therefore, the EPA and the Malawian government must invest in efforts to create awareness on gender equality in the community and households. This could result in creating a gender equal environment for agricultural success.

The participation and hard work of women in CA activities also shows that women can be a resource in the upscaling of the practice. The link between land tenure security and upscaling of CA is also important to acknowledge, as it influences women's participation. It can therefore be concluded that empowering women to participate more in decision making on land as well as financial resources, would consequently result in upscaling of CA. These results are based on views and experiences of the people interviewed in this study but the conclusions might be extended to other farming communities in Malawi. Despite variations in economic and social factors, the norm of unequal gender power in decision making is common in the country. The following lessons are drawn from the results:

- CA is an important and beneficial intervention, especially concerning women farmers' workload, but also soils and yields.
- Changes in mindsets regarding gender issues are still far from being achieved, but success of women farmers is dependent on changes in decision making and labour division within farm households.
- Current efforts are being made in Mwanambwa towards making gender equality a part of extension service in agriculture.
- Sociocultural norms still play a clear role in gender division of tasks and responsibilities in Malawi.

With an understanding of the context, past research and current conditions of practices, the study therefore makes the following recommendations:

- The government and NGOs should make more investments in training and educating communities on gender equality issues. This could potentially play a crucial role in making agricultural activities and interventions more beneficial to both men and women, strengthening household welfare. Gender sensitive approaches should be promoted more through extension services, advancing both gender equality and solutions for agricultural sustainability.
- More investment in training and other inputs is needed to encourage more women to practice CA. So far, no deliberate efforts have been made towards specifically targeting women. The EPA must make efforts to direct support from NGOs and government towards upscaling women's participation in conservation agriculture. Through interviews and discussions, it was repeatedly expressed that if more inputs were provided, more women would begin to practice CA.
- Finally, the study recommends that the government explores alternatives to use of herbicides in CA. Use of herbicides has been shown to be expensive and pose health risks. Many women in this study could not afford herbicides and failed to practice CA due to the lack of it. Other studies have found that these chemicals may cause health problems. Hence it is recommended that alternative methods, such as physical and

biological weeding, such as the use of onion and garlic currently being practiced in other parts of Malawi, be explored.

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APPENDICES

Appendix I Focus Group Discussion Guide

I Agricultural practice and understanding of CA benefits

- a) Women's work/tasks in agriculture. What work/tasks are women doing in agriculture in this village?
- b) What about men, what are their roles and tasks? How do these differ from the roles of women? Has there been any change in roles and tasks in the past years?
- c) Could you please tell us who normally has control over the land in your community?
- d) Meaning and benefits of CA. What do you think are good agricultural practices? Can you explain more the benefits of practicing CA for women farmers? what are the benefits of CA to the community?

II Major challenges women face in adopting Conservation Agriculture

- a) Challenges/hindrances women experience in CA adaption. What are the challenges/hindrances women face in adopting CA?
- b) Could you please explain why you as women are experiencing these challenges/hindrances?
- c) What about for men practicing CA, do they face similar challenges in CA adoption? How are challenges different for men and women?

III What is facilitating CA adoption and required support

- a) Have you received any form of support for CA adoption? Explain more about who was giving that support and what kind of support you received?
- b) Could you please explain more about the type of farmers who receive support for CA? Which farmers have participated the most and why?
- c) Have you/or other women taken the initiative to ask for support in practicing CA? Why/why not? Have effort to source support been successful? What do you think are the reasons it was successful or not successful?

III Upscaling CA adoption of women

- a) How can women best be assisted to improve their participation in the practice? What kind of support would women need? Who do you think should provide the support?

Appendix II Key Informant Interviews

I Trends and variations in adoption of Conservation Agriculture

- a) Could you please tell us about issues of land ownership within the community? As well as crop management and sells after harvest. What are the different roles of men and women in the community?
- b) Could you give a brief background of conservation agriculture practices in the area? What has been the trend of adoption in the past 10 years?
- c) What category of farmers /farm households adopt the practice more? (men/women; male-headed hh/women headed hh; smaller/larger; grower of specific crops). Please explain why there is difference in adoption.
- d) What has been the trend of adoption in general and specifically among women?

II Challenges to ca adoption

- a) Overall what are the major challenges that farmers practicing CA are facing?
- b) Is there a gender difference in these challenges? How are women farmers affected differently from men by these challenges?

III Institutional capacity and support

- a) What kind of support have farmers in this area/village received in practicing CA? Who has provided the support?
- b) Has there been any support that has specifically been directed towards women farmers? If yes, describe what has been done. If not, what is the main reason?
- c) In your position/work what role do you, or can you play in creating an empowering environment for women participation in CA?
- d) Who do you believe has, or can have, most influence on women's involvement in CA?
- e) In your opinion, what are positive effects of women farmers practicing CA? Do you see some negative effects of women practicing CA or working with women in CA?
- f) What kind of support, is need to upscale women's involvement in CA? What do you think is the best way to do it? Who should provide it?