A qualitative evaluation of gender aspects of agricultural intensification practices in central Malawi

Colletah Chitsike, Jessica Kampanje-Phiri, and Noel Sangole

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## Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AR</td>
<td>Africa RISING</td>
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<tr>
<td>AEDCs</td>
<td>Agriculture Extension Development Coordinators</td>
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<tr>
<td>AEDOs</td>
<td>Agriculture Extension Development Officers</td>
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<tr>
<td>CHH</td>
<td>Child Headed Household</td>
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<tr>
<td>EPAs</td>
<td>Extension Planning Areas</td>
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<td>FAO</td>
<td>Food and Agricultural Organization of the United Nations</td>
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<tr>
<td>FFA</td>
<td>Force Field Analysis</td>
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<tr>
<td>FGD</td>
<td>Focus Group Discussion</td>
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<tr>
<td>FHH</td>
<td>Female Headed Household</td>
</tr>
<tr>
<td>GA</td>
<td>Gender Analysis</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>HIV and AIDS</td>
<td>Human Immuno Virus and Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>IITA</td>
<td>International Institute of Tropical Agriculture</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labor Organization</td>
</tr>
<tr>
<td>KII</td>
<td>Key Informant Interviews</td>
</tr>
<tr>
<td>MHH</td>
<td>Male Headed Household</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>PHH</td>
<td>Polygamous Headed Household</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for Social Scientists</td>
</tr>
<tr>
<td>TORs</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>LUANAR</td>
<td>Lilongwe University of Agriculture and Natural Resources</td>
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Acknowledgements

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Executive summary

The “Qualitative evaluation of gender aspects of agricultural intensification practices in central Malawi” study was commissioned by IITA Africa RISING. The study’s main objective was to provide guidance in better understanding gender dynamics in Dedza and Ntcheu districts of central Malawi to improve gender integration in agronomic practices and technologies being promoted by Africa RISING. The aim was to gain an in-depth understanding of gender issues surrounding the adoption and adaptation of Africa RISING technologies at household and community level and to compare how male and female farmers perceive extension approaches to inform discussions and decisions on gender-responsive strategies as well as practices to be chosen for scaling up in Africa RISING’s second phase.

Study methodology

The study principally employed a qualitative research approach with data collected at household, community, and institutional levels during October and part of November 2016. An extensive review of existing literature was done focusing mainly on annual reports, baseline survey reports, discussion papers, and relevant scholarly publications. Twenty-three key informant interviews with stakeholders at national, district, and community levels were conducted. Eleven focus group discussions (FGDs) were conducted in four Extension Planning Areas (EPAs) of Kandeu and Nsipe in Ntcheu District, and Golomoti and Linthipe in Dedza District. Of the eleven FGDs, five comprised male participants only while the other six comprised female participants only. In addition, a demographic questionnaire was administered to 148 FGD respondents from all four EPAs. Direct field observations also complemented these approaches.

Validation meetings with all the eleven groups in the four EPAs were conducted to supply missing information and validate our findings with the farmers at community level. A stakeholder’s validation workshop was held in Lilongwe that was attended by key informants who provided useful feedback that was incorporated into the report.

Data analysis and conceptual framework

Naila Kabeer’s (1994) Social Relations Approach (SRA) was used in this study. This framework was applied as a method to analyze existing gender inequalities in the distribution of resources, responsibilities, and power dynamics within our sampled communities. Specifically, using the frameworks’ analytical concepts/spheres of household, community, market, and state, the team was able to trace the interaction of such concepts and how values, norms, and rules set in one sphere influence decision making processes and resource allocation in another.

The study also used qualitative content analysis to come up with major themes from the study’s qualitative data based on the evaluation questions. Analysis of demographic data collected was performed using Statistical Package for Social Scientists (SPSS) to come up with means, frequencies, and averages for the interviewed farmers.
Main findings

**Evaluation Question 1: Criteria used by male and female farmers in evaluating new agricultural practices for suitability and why**

The team found that the criteria used by both male and female farmers in evaluating new agricultural practices and suitability are not only affected by socially constructed roles and responsibilities assigned to men and women in the society, but also by the internal contradictions in the culture of ownership of land and assets accrued by households. As such, most of the female participants in the study indicated that female farmers tend to be more concerned with household food security because they have been brought up to take care of the home. In contrast, most male farmers preferred technologies/varieties that are demanded by the market.

Specifically, the study established that female farmers use different criteria when evaluating new agriculture practices for suitability. The criteria often mentioned by female participants in the study included: (i) food security especially in terms of relish, (ii) high yielding varieties, (iii) early maturing crops, (iv) marketability of the crop, (v) multiple usage of the crop, (vi) ease of management of crop, i.e., not requiring spraying or much labor, and (vii) easy to cook.

On the other hand, male farmer participants mentioned fewer criteria (4) compared to female farmers (7) and in some cases, there were some similarities with those mentioned by female farmer participants. Thus, the criteria often mentioned by male farmers included: (i) marketability of crop, (ii) high yield, (iii) food security, and (iv) availability of land.

Although there were similarities in some of the criteria mentioned by both male and female participants such as food security, for men food was perceived in the context of maize availability while for female participants it was beyond just maize availability; also it meant daily availability and preferences of relish and other processed products as well as nutrition for the family, particularly the children. The above criteria therefore suggest a link between women’s expected role in caring for the household members through cooking and making sure that every household member is fed as ascribed within the socio-cultural context of the study sites. Similarly, men’s ascribed role as family providers also influenced their preferred technologies and practices being introduced by Africa RISING.

**Evaluation Question 2: Africa RISING practices adopted and not adopted by male and female farmers**

The key practices and technologies that were often mentioned as having been adopted by both female and male farmer participants included: (i) intercropping, (ii) doubled-up legumes, (iii) maize fertilized with NPK and urea using the Sasakawa method (i.e., planting one plant per station spaced 25 cm apart), (iv) use of *Gliricidia* and *Faidherbia albida* as supplementary feed to livestock.

For instance, in Golomoti EPA both the female and male participants indicated that they preferred intercropping practices to monocropping, although there were differences between female and male farmers in terms of their intercropping choices. Female farmers preferred maize intercropped with cowpea while male farmers preferred maize with pigeon pea.

The doubled-up legume practices that were frequently mentioned by most of the female and male participants in the FGDs included: groundnut with cowpea, groundnut with pigeon pea, and pigeon pea with soybean. However, most of the female participants from all the
four EPAs indicated low preference for groundnut and pigeon pea due to challenges experienced during harvesting time, where they have to take care to avoid damaging pigeon pea roots, which are close to the groundnut. Most of the male participants preferred the groundnut and pigeon pea doubled-up technology. Pigeon pea pure stand was not adopted or preferred in all the EPAs except in Kandeu due to goats that are allowed to graze freely and end up eating the crop.

Labor intensiveness of some technologies such as the ones involving the Sasakawa method of planting and making compost manure proved to be a challenge for adoption by female-headed households faced with labor constraints. However, most of the participants indicated that labor intensiveness was not an issue, since they were now able to have higher yields from a small piece of land.

**Evaluation Question 3: Africa RISING practices adapted by male and female farmers**

Most of the participants in all four EPAs reported that they had gained experience from the mother trial fields and replicated what they learnt in their own pieces of land that matched the seed received from the project. The extension staff interviewed did not have systematic tracking on the uptake and adaptation of the practices nor had the AR technicians. Our discussions with farmers yielded only first insights. For example, in Kandeu and Nsipe, male participants indicated that they did not like the sole pigeon pea as a treatment – they contended that whenever they grow pigeon pea, it has to be intercropped with maize, therefore this was one of the adaptations that had to be made in these two EPAs. In Linthipe EPA, the female participants explained that where they use the Sasakawa method they plant beans next to the maize plant for every fourth planting station. This is due to the importance that is attached to the beans by female farmers as an early maturing crop for relish.

In Nsipe it was found that the male farmers opted to use CG7 or Chalimbana (large-seeded) varieties for groundnut-related technologies instead of the Nsinjiro variety, which was being distributed by Africa RISING, because CG7 and Chalimbana were said to be highly marketable compared to Nsinjiro despite being a high yielding crop. They also indicated that Nsinjiro is difficult to shell due to its small-seeded nature although it is the women who were reported as doing most of the shelling. These first insights should be complemented by further research on how farmers’ have adapted AR technologies to their main gardens apart from the land designated to mother/baby trials.

**Evaluation Question 4: Important sources of information on agricultural practices and management**

The main source of agricultural information was said to be government extension services and Africa RISING with additional information sourced from NGOs, radio or television agricultural programs, and traditional leaders. Our findings further reveal that farmers in the AR project areas do not receive any form of agricultural information based on systematic and significant differences between female and male farmers. However, one of the key informants mentioned a gender-related challenge in terms of access to agricultural information where women’s reproductive and productive roles tend to pose time constraints on them to attend formal trainings conducted by either government extension workers or other service providers.

**Evaluation Question 5: Extension activities underway and local perceptions**

Africa RISING has used a variation of the popular lead farmer approach, termed “mother and baby trials” to educate and disseminate research products (technologies and agronomic practices) to the farmers in Dedza and Ntcheu. Most of the participants, particularly the
females, appreciated the mother and baby trials of Africa RISING as opposed to government extension demonstrations because in the former approach they implement what has been learnt on the mother field in their own fields within the same season and are provided with seeds for at least four treatments or practices.

The study also found that major organizations providing various extension services in Nsipe and Golomoti EPAs include: the Hunger Project, the National Smallholder Farmers Association of Malawi (NASFAM), Total Land Care, Japanese Tobacco International (JTI), and the Micro Loan Foundation. Total Land Care was also reported to be working with farmers in Kandeu EPAs on conservation agriculture, and agroforestry and afforestation activities. In Linthipe EPA, CIAT and Concern Universal were mentioned as the major institutions providing research and extension services while institutions such as ICRAF, Central Regional Milk Producers Association (CREMPA), and LUANAR provided extension services, trainings, and other resources to the Dzaonewekha milk-bulking group.

Key recommendations

- There is need for more gender analysis based on existing databases and ongoing research. Gender analysis should consider the division of labor within the household, access and control of assets and resources, and the gendered allocation of benefits from the intensification of various crops.
- Further research should establish adoption and adaptation of the various knowledge products/technologies introduced under the mother and baby approach beyond the trials to other farmers’ fields to better understand which practices are preferred.
- Africa RISING should consider partnering with government and add a component of “edutainment” for households (such as drama with specific Africa RISING technologies) in order to communicate research products in a simpler way to farmers.
- A community development consultant specializing in gender issues should be attached to the research project to build the capacity of farmers, extension, and scientists on processes of engaging men and women in technology adoption intensification and markets.
- Africa RISING should take a household approach to its gender programming. This would encourage households/community members (both participating and not participating in Africa RISING trials) to have common goals in improved livelihoods through practicing Sustainable Agricultural Intensification (SAI) activities.
- Africa RISING should maintain its efforts to train farmers to multiply their own seed to increase production and reduce long-term dependency.
Introduction

Agriculture is an engine of growth and poverty reduction in Africa. The sector is underperforming in many countries in part because women, who are often a critical resource in agriculture and the rural economy, face constraints that reduce their productivity (SOFA Team and Doss, 2011). Shumba (2011) also indicates that agriculture is the backbone of most African economies where it provides about 33% of the African GDP and 40% of its exports. Women have been known to be the key players in this field. For instance, Ngwira et al. (2003) show that 70-80% of all subsistence farming in Africa is carried out by women.

Malawi’s agricultural scenario is similar to the statistics presented above. As reported in the country’s strategic country gender assessment report, 83% of the economically active persons within the agricultural sector and its related activities are women (Ngwira et al. 2003). Women dominate the agricultural sector with about 97% of rural women engaged in subsistence farming, while men dominate in the cash crop production, services, operation, laboratory, and administrative occupations (Ngwira et al. 2003). This trend tends to conform to gender role expectations as well as patterns in women’s educational attainment. The Malawi Strategic Country Gender Assessment report further indicates that in Malawi most women do not possess the required specific kinds of training and levels of education that can make them competitive in assuming occupations, leadership or entrepreneurial-oriented tasks that are mostly dominated by men as well as maximizing and benefiting from their labor efforts (Ngwira et al. 2003).

Another pertinent aspect of the Malawian agrarian economy is that most of its communities largely rely on agriculture for both subsistence and economic growth. Agriculture and natural resources form the core of livelihoods across several value chains from production to processing of agricultural produce, livestock, and fisheries. In cognizance of the importance of agriculture in Malawi, government, development partners, NGOs, parastatals, and researchers tend to direct their efforts towards boosting the sector. The recent introduction of different Africa RISING knowledge products aimed at sustainable intensification of agricultural and livestock production is just one of the many examples of such efforts.

Despite the various efforts aimed at boosting the agricultural sector in the country, one question that remains salient is how women can have maximum benefits from their labor through their participation in the different agricultural intensification programs/interventions. In an attempt to address this question, ongoing efforts by various government departments, development partners, NGOs, and researchers have been directed towards eliminating the effects of the disadvantaged position that most Malawian women assume within the agricultural sector and beyond (Bernbaum 1999; Government of Malawi 2012.). In most cases, however, such efforts have not resulted in significant changes of people’s livelihoods. This is partly due to a lack of implementation of context specific interventions (Bernbaum 1999). For instance, conventional ways of targeting subsistence farmers as one homogeneous group within both developmental interventions and research activities are still predominant, despite the fact that farmers or women groups in Malawi are diverse and live differentiated livelihoods (IFAD 1999; Ellis 2000).

Realizing the need to bridge these two aspects; the predicament of women in Malawi and the need to introduce context specific and gender relevant research/knowledge products, Africa RISING commissioned a team of consultants to gain a deeper understanding of gender dynamics in relation to their introduced research/knowledge products in Ntcheu and Dedza districts of Central Malawi.
Objectives of the evaluation
To generate context-specific insights, the objectives of the qualitative evaluation according to the TORs are:

i. To gain an in-depth understanding of gender issues surrounding the adoption and adaptation of Africa RISING technologies at the household as well as the community level. This includes an understanding of intra-household decision-making and labor allocation, access to resources (such as land, water, inputs etc.), access to information and questions of participation (for instance, access to extension services and participation in farmers’ field days), and benefit sharing among male and female household and community members.

ii. To improve the understanding of how male and female farmers perceive extension approaches, comparing the traditional Malawi demonstration approach, and the Africa RISING mother and baby trial participatory action extension approach.

iii. To inform discussions and decisions on gender-responsive strategies and practices to be chosen for scaling in Africa RISING’s second phase.

Specifically, the analysis concentrated on getting in-depth insights on five specific evaluation questions:

**Evaluation question 1**
Which criteria do female farmers, heads of household and married, use when evaluating new agricultural practices for suitability? And why? Which criteria do male farmers use when evaluating new agricultural practices for suitability? And why? How can gender differences in evaluation criteria be explained?

**Evaluation question 2**
Which practices have been/have not been adopted by male farmers? Which Africa RISING practices have been/have not been adopted by female farmers, heads of household and married? Why have female or male farmers adopted/rejected certain practices? What is the relationship between these decisions and gender dynamics in terms of labor allocation, income distribution, access to resources, and to information as well as other key aspects of gender analysis?

**Evaluation question 3**
Have female farmers adapted certain Africa RISING practices to make them more suitable for their use? Why have they adapted them? Have male farmers adapted certain Africa RISING practices to make them more suitable for their use? Why have they adapted them?

**Evaluation question 4**
In each community, what are the most important sources of information about agricultural practices and management? How do female farmers have access to agricultural information? How do male farmers have access to agricultural information? How can gender differences in access to information and participation be explained?

**Evaluation question 5**
In each community, what are the types of extension activities underway and local perceptions? How do female farmers perceive mother and baby trials of Africa RISING versus extension demonstrations? How do male farmers perceive mother and baby trials of Africa RISING versus extension demonstrations? How can gender differences in the perception of extension approaches be explained (mother and baby trial approach of Africa RISING and extension)?
The five evaluation questions give an indication of a divide between the private sphere involving personal relationships, and the public sphere, which deals with institutional relationships that might be prominent in the Africa RISING producer groups and wider community structures. In this case, the evaluation team focus was on how power relations at the household/family/kinship level interrelate with those at the community, market, and state levels (March et al. 1999). This is also where Naila Kabeers’ Social Relations gender analysis approach becomes more relevant. Kabeers’ Social Relations framework applies a holistic approach to gender analysis aimed at understanding gender inequalities in the distribution of resources, responsibilities, and power at family/kinship, community, market, and state levels (Kabeer and Subrahmanian 1996; March et al. 1999). Specifically, the framework is based on the premise that:

“...the processes by which gender inequalities are socially constructed are not confined purely to household and family relationships, but are reproduced across a range of institutions, including many of the policy making agencies whose avowed objectives are to address the different forms of exclusion and inequality within their societies” (Kabeer and Subrahmanian 1996: 17).

The framework was therefore found to be relevant for an analysis that aims at understanding gender inequalities at different institutional levels in the face of complex and dynamic social realities. Thus, the team employed this framework to understand gender and institutional dynamics among different groups involved in the Africa RISING research program. This analytical framework was considered to be relevant for this evaluation due to its wide applicability in understanding how four main institutions; household, community, market, and the state interrelate in fostering decision-making processes, activities, and resource allocation (March et al. 1999). More specifically, the team examined the interaction between men and women involved in Africa RISING and individual institutions that foster decision-making, activities, and resource allocation processes through specific gendered rules, norms, and power relations.

**Contextualizing Africa RISING research/knowledge products**

To be able to address the five evaluation questions stated in section 1.1 above, contextualizing the Africa RISING research program and its research products is essential. Africa RISING is a multi-stakeholder agricultural research program, which was launched in 2011 with funding from USAID under the Feed the Future Initiative. The program aims at identifying and validating scalable options for sustainable intensification of key farming systems in Ethiopia, Ghana, Malawi, Mali, and Tanzania. In return, the identified scalable options are anticipated to increase food production, improve livelihoods, and enhance nutrition of smallholder farmers while at the same time conserving or improving the natural resource base. Practices and technologies being promoted by Africa RISING in Malawi can be grouped within four main themes:

1. Integrated maize-legume systems (including new bean varieties and double-up legumes)
2. Livestock intensification (with a focus on poultry and small ruminants)
3. Food processing and nutrition
4. R4D platforms and networks

During the first phase of its implementation (between 2011 and 2015), Africa RISING established itself firmly on the ground with the development and introduction of selected research/knowledge products (technologies). The Africa RISING external review report documents the first phase (2011-2015) activities of integrating crop and livestock production
for improved food security and livelihoods in rural communities. It indicates that AR had made many achievements in Malawi and in Tanzania despite timing limitations with planned activities. In Malawi, Africa RISING has used a variation of the lead farmer approach, mother-baby trials in four Extension Planning Areas (EPAs) in Dedza and Ntcheu districts of the central region of Malawi to boost productivity of crops and livestock. The approaches provide an opportunity for participatory research, but most importantly are used for demonstration and training of farming communities. In the mother-baby trials, researchers in partnership with district agricultural development extension offices establish farmer groups. Lead farmers (mothers) provide land and group members (baby trial farmers) are also provided with seed and encouraged to test varieties and management options in their own land as well as supporting the mother farmers by providing their labor. In this case, Africa RISING researchers from CGIAR have supplied seed and designed the protocols for mother-baby trials. These trials have become a focus for collective learning during the growing season through hands on in situ training. Thus, members of the farmer groups (baby trial participants) provide labor at mother trials in exchange for knowledge acquisition and seed they get to apply in their own gardens.

Little attention has been given to typologies of households that are participating in these trials as well as the gender dynamics and adoption patterns in the communities where trials are being introduced. This is despite a large amount of literature (Bezner Kerr 2005; Fisher and Kandiwa 2014; Hockett and Richardson 2016) showing the significant relationship between intra-household gender dynamics, resource allocation processes, and adoption of technologies. As such, to unleash the full potential that participatory approaches have in changing community livelihoods and establishing farmer/researcher partnerships and improving adoption rates of technologies (Snapp et al. 2002), the application of gender-sensitive approaches needs to be contextualized.

**Report outline**

In view of the foregoing, the section that follows synthesizes literature on household/gender dynamics in central Malawi, particularly Dedza and Ntcheu districts as well as the implication of different agricultural intensification approaches within specific farming systems. This literature review is therefore meant to set the stage for the study’s empirical data presented in Chapter 4 of this report. Thus, while chapter 1 introduces the study, chapter 2 deals with relevant literature review. Chapter 3 discusses the research methodology, limitations, and data analysis. Chapter 4 discusses the findings of the study and chapter 5 provides conclusions and recommendations.
Literature review

This literature review, for the Qualitative Evaluation of Gender Aspects of Agricultural Intensification Practices in Central Malawi, analyzes available literature on gender and agricultural development within the Malawian context and highlights the gendered differences in the division of agricultural labor, access to resources, participation, decision-making, and benefit sharing between women and men. In addition, the literature also traces factors that influence adoption of technologies among smallholder farmers. Specifically, the relationship between labor, land and agricultural information access, and technology adoption/adaption will be scrutinized. A content analysis approach was employed for this literature review. Specifically, a wide range of scholarly publications, program reports, policies, and project documents of different organizations implementing their gender and agriculture-related activities in Malawi were subjected to this analysis.

Contextualizing gender dynamics within Malawian social formations and farming systems: A historical perspective

Understanding the differences in gender roles and relations across different cultures is crucial for analysis and implementation of different programs, projects, and policies. Even more important is the understanding of historical perspectives as this influence the effectiveness of different gender transformative goals. Even though gender relations generally place men in more powerful positions, the extent differs significantly across different cultures. In some cultures, women have access to assets that give them a bargaining and fallback position in decision-making as well as in control and ownership of assets. An analysis from a contemporary historic point of view, envisages Malawi and most African societies as generally patriarchal formations (Mkandawire 2012). Claims have, however, been made of a matriarchal origin of humankind in several publications (Phiri 1983). Saidi (2010) highlights that matriarchy, a system which is mirrored by matrilineal social formations, should not be understood as an overall dominance of women over men but rather a social formation in which equity is based on women’s exercised roles which are considered central to that social formation. This is a basic proposition of scholars that subscribe to the matriarchal school of thought of non-female dominance (Rosaldo et al. 1974).

Matrilineal values have however been distorted over time and been influenced by historical events in the pre-colonial, colonial, and post-colonial eras (Phiri 1983). It is indeed recorded that the early settlers, the Maravi people, who are the main ancestors of present day Malawians were matrilineal (Phiri 1983). They however suffered invasions from other Bantu clans of the Ngoni who were patrilineal, settling mainly in the north and the matrilineal Yao who settled in the Southeastern part of the country. It is also argued that conquered sects of the Maravi people started ascribing to the patrilineal norms of their invaders (Phiri 1983). With the exception of the Yao, who were largely traders with the Arabs and Portuguese, the position of men in the matrilineal clans strengthened when the need for military might increased. Women needed protection against invaders. In addition, trade gave Yao men admirable status in societies. Some resorted to marrying slave women to avoid moving to their wife’s (free women) home where they would be treated as “work horses”. This need for protection and the fact that men had trade advantages eventually weakened women’s position and they became subservient to the men (Berheide and Segal 1994; Davison 1993; Hirschman and Vaughan 1983; Vaughan 1987).
The colonial and missionary era saw massive changes in gender relations. In a bid to seek protection from slave traders, most communities sought refuge at European mission centers, eventually adopting their patriarchal values and norms. The colonial administrators themselves deliberately influenced gender relations as they granted men ownership of land and asked women to join the men on those pieces of land. The abolition of the slave trade in 1890 meant that Yao men would be subjected to their less dominant and dependent status, however they were not ready to revert to the colonial masters and their values, which they largely resented (Mandala 1982).

The introduction of money and market goods intensified male dominance as women became more reliant on men to “provide for the household”. Money was mostly required to buy goods that had been introduced by the British commercial settlers and increasingly to supplement yield, which had significantly dropped due to a decline in both the quantity and quality of land. It is argued that this decline in the land quantity and quality and consequent drop in yield led to the diminishing of women’s productive autonomy and relative position of power (Berheide and Segal 1994; Davison 1993; Hirschmann and Vaughan, 1983; Vaughan 1987). For instance, matrilineal women’s control over fields and food is often argued to have further deteriorated due to the patriarchal presumptions of missionaries, commercial settlers, and colonial officials (Davison 1993; Phiri 1983; White 1987). The missionaries, commercial settlers, and colonial officials either assumed that men were household heads or felt they should be. Therefore, when allocating land to locals they tended to grant it all to men – irrespective of traditional ownership and inheritance regulations (Moore and Vaughan 1994). In sum, men’s control over material resources started increasing while that of women started diminishing in many instances.

Furthermore, the colonial administrators tended to prefer the promotion of men to women by giving them privileged access to means of production (Mandala 1982). For instance, men’s privileged access to education and wage labor gave them a virtual monopoly on cash, on which women increasingly depended. Thus, men’s independence from and authority over women is generally said to have started increasing (Davison 1993; Hirschmann and Vaughan 1983; Mandala 1982; Mitchell 1956; Semu 2002).

During and after the first post-colonial government’s regime, development programs kept undermining women’s position in Malawi, as they did elsewhere in Africa. Based on Western household models and gender stereotypes, productive interventions were, and often still are, directed at men as the presumed household heads and main food producers (Boserup 1970; Baerends 1994; Ferguson 1994). According to Arnfred (2004), information on new agricultural technologies and the tools to apply these was generally biased towards men. Women were, however, excluded even though they do most farming activities. “Besides this material privileging of men at the expense of women, the tendency of development agencies to see and treat African women as subordinate to men and in need of empowerment may have further degraded the female self-image” (Arnfred 2004:12).

In addition to the various advances of men’s position vis-à-vis women, it should also be mentioned that, meanwhile, some of the arguably most masculine traditional tasks have become decimated or annihilated due to external circumstances. For instance, conquering new fields from nature is no longer necessary as almost all land has been cleared (Mandala 1982). Hunting for large mammals is impossible as the few that are left reside in protected wildlife reserves, raiding for slaves has been prohibited since the colonial era, and adventurous long-distance trading journeys have also ceased progressively. While the tasks through which women can confirm their gender continue to be diverse cultivating fields,
preparing food, bearing and caring for children, and housekeeping – those for men have increasingly narrowed down to the provision of money, yet are seen by many as the most important (Mandala 1982).

Despite Malawi being historically matrilineal, events have occurred altering gender relations to a significant extent, consequently influencing access to and control of assets as well as women’s voice in the private and public domains. The introduction of capital and other valuable assets from a patriarchal background reinforced the domination of men and subordination of women. Even where such relations remained unchanged, the new roles and their valuation favor men and envisage their roles as central to the current social formation and farming systems.

Understanding gender dynamics within matrilineal farming systems: The case of Dedza and Ntcheu districts

The people of the Dedza and Ntcheu in central Malawi are of Chewa and Ngoni origins and practice a form of matrilineal that has proven remarkably resilient in the face of direct and indirect challenges. There are two schools of thought pertaining to the changes that have occurred within the matrilineal system of central Malawi. On the one hand, scholars like Moore and Vaughan (1994) explain that there are misperceptions and prejudices about matrilineal being changed by Christian missions and the promotion of a patriarchal nuclear family by Christian and Islamic missions as well as by government policies and by estate tenancy. Most of the scholars subscribing to this school of thought (e.g., Englund 1999; Phiri 1983; Moore and Vaughan 1994) argue that it is rather a reconfiguration than radical change that has occurred within the matrilineal system. On the other hand, some scholars (e.g., Mtika and Doctor 2002) subscribe to the notion that an attack on matrilineal by the agricultural development policies of the 1940s and 1950s and the privileging of men in extension of agricultural and other services by colonial and post-colonial governments has disadvantaged women. Consequently, there has been a move from matrilineal to patrilineal among social formations of central Malawi. Today, the continued predominance of matrilineal in village life of central Malawi presents considerable gender complexities, ranging from women’s authority, especially with respect to land ownership, their pivotal role within “household” or and kinship relations that operate in socioeconomic and gender matters. In view of the many changes and reorganizations that have taken place in the past thirty years or more (including the effects of HIV and AIDS, better education, and awareness of rights), it is difficult to attribute matrilineal or patrilineal only as affecting gender dynamics in subsistence agriculture and social formations of central Malawi.

To best understand the current complexities that today’s central Malawi matrilineal system presents, a deeper synopsis on land ownership, decision making processes, allocation of labor, access and control of resources as well as the benefit sharing of agricultural proceeds within this system is essential. The aforementioned aspects affect the adoption, adaptation, or rejection of newly introduced agricultural technologies within the current matrilineal farming systems that are discussed below.

Land ownership and use

Smallholder agriculture in Malawi occurs largely on customary land, which accounts for approximately 80% of the total land area. Customary land is owned by the state, but control and administration is delegated to the chiefs of clearly defined villages (Kishindo 2004). Village chiefs have the right to allocate land within their jurisdiction, but the role of chiefs in land transfers in Malawi has diminished with increasing land scarcity due to population...
increases and changes in land legislation in the recently accepted land act where the role of chiefs to redistribute or authorize selling of customary land has been minimized (Zuka 2015). In Dedza and Ntcheu the changes that are taking place in land ownership are happening against the background that land distribution laws have not been formalized.

With the recent approval of the new land bill in July 2016, women and men can gain access to land primarily through inheritance and marriage. Different land transfer methods are mainly due to different descent practices, namely matrilineal and patrilineal. They are also based on residence status in matrilocal contexts where married men reside in their wife’s village and in patrilocal contexts where married women reside in their husband’s village (Kishindo 2004). In Dedza and Ntcheu, the predominant way of accessing land is through inheritance from matrilineal descent. Within this system of inheritance, studies have shown that about 80% of women own land in comparison to less than 20% of women who own land within patrilineal systems (Zuka 2015; Bezner Kerr 2005). This follows that most of the men from matrilineal systems access land through marriage or direct inheritance from their matriline (Fisher and Kandiwa 2014). Women’s ownership of land in such cases does not always translate into control of it. As earlier elaborated in this literature review, men’s control over material resources such as land and decisions concerning its use and products have increased over the years, while that of women has diminished (Davison 1993; Hirschmann and Vaughan 1983; Mandala 1982; Mitchell 1956; Semu 2002). In Table 1, Zuka (2015) summarizes this argument through their findings for matrilineal and patrilineal farming systems in Central and Southern Malawi. His findings show high percentages of women owning land, but not having control within the matrilineal system of inheritance, while women in patrilineal systems are disadvantaged in both ownership and control of land as reflected by the lower percentages for both.

<table>
<thead>
<tr>
<th>District</th>
<th>Land Tenure</th>
<th>Gender</th>
<th>Access (%)</th>
<th>Ownership (%)</th>
<th>Control (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kasungu</td>
<td>Patrilineal</td>
<td>Male</td>
<td>97.3</td>
<td>87.4</td>
<td>82.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>100</td>
<td>12.6</td>
<td>17.1</td>
</tr>
<tr>
<td>Machinga</td>
<td>Matrilineal</td>
<td>Male</td>
<td>100</td>
<td>26.2</td>
<td>81.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>100</td>
<td>73.8</td>
<td>19.0</td>
</tr>
<tr>
<td>Thyolo</td>
<td>Matrilineal</td>
<td>Male</td>
<td>100</td>
<td>17.9</td>
<td>58.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>100</td>
<td>81.1</td>
<td>41.4</td>
</tr>
<tr>
<td>Nsanje</td>
<td>Patrilineal</td>
<td>Male</td>
<td>95.2</td>
<td>79.9</td>
<td>81.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>100</td>
<td>20.1</td>
<td>18.7</td>
</tr>
</tbody>
</table>

Source: Zuka 2015.

The results above validate scholars’ observations that in Malawi’s southern and central regions, it is mostly women who own land. This, however, does not guarantee the ownership of the products and benefits from agriculture (Bezner Kerr 2005; Simtowe 2010; Zuka 2015).

As ascertained by Davison (1988), land, whether inherited, allotted, purchased, or seized, remains the most basic resource of agricultural production. This Africa RISING gender study included discussions with farmers regarding ownership of land used for agriculture and for research trials and how that allocation of land to research has benefited men and women. Furthermore, the study investigated how land ownership, control, and access consequently affect adoption of technologies or knowledge products being promoted by Africa RISING. In
addition, it is pertinent to understand how decisions on ownership, control, and access are made within matrilineal households/farming systems.

Intra-household decision making processes

There are two dominant schools of thought pertaining to the status of women in decision-making processes within matrilineal farming systems. On the one hand, some researchers have argued that women from matrilineal systems have more power to bargain with their husbands on what crops to grow, what inputs to use, and how proceeds from agricultural production can be shared. This is partly due to the fact that most women own land (Bezner Kerr 2005). Others have argued that regardless of women's land ownership, women have less decision-making capabilities within both patrilineal and matrilineal settings (Chirwa et al. 2011; Fisher and Kandiwa 2014).

Bezner Kerr’s study on food security in northern Malawi, a predominantly patrilineal setting, states that women’s bargaining power within a household to utilize income, labor, and other resources is often compromised by unequal entitlement of cash, credit, land, and other social norms that tend to favor men over women (Bezner Kerr 2005). Fisher and Kandiwa’s (2014) research on agricultural input subsidies and the gender gap in Malawi confirms a similar situation for matrilineal systems and most of the rural households in Malawi. It shows that decisions related to crop choice, input use, and the timing of agricultural activities are mainly taken by men. Exceptions are unmarried women or FHHs (see also Chirwa et al. 2011).

Even though there are differences in researcher’s points of view on women’s bargaining power in household decision-making, most researchers seem to agree on the types of crops that both men and women have decisions over. More generally, studies that have been done in both patrilineal and matrilineal settings of Malawi (including Dedza and Ntcheu) show that men tend to control and dominate in decisions over cash cropping agricultural activities, while women dominate in food-crop-related decisions (Simtowe 2010; Chirwa et al. 2011; Hockett and Richardson 2016)). Generally, plots controlled by men for cash crop production tend to be larger and more fertile than those controlled by women for food production (Chirwa et al. 2011). Consequently, labor allocation for food and cash crop production within specific farming systems is an interesting area to explore.

Allocation of labor for agricultural activities

Labor is an essential input in agricultural production systems because most tasks require an investment of time. This is particularly true in Malawi where there is limited use of animal traction and the hoe is the main farm tool; only about 5% of Malawian farmers have access to mechanization (World Bank 2015). In Malawi, the introduction of modern crop varieties and practices generally increases farm labor demand during the peak agricultural season because these varieties typically require manure and fertilizer application. In contrast, local maize is commonly grown without fertilizer; thus, adoption of improved varieties and natural resource enhancement can be impeded by limited availability of household or hired labor (Fisher and Kandiwa 2014).

Women’s formal employment in the agriculture sector is at a less meaningful level. Most women are self-employed in subsistence farming and in minimum-wage, informal employment such as ganyu (casual labor). Ganyu is usually seen as a means of accessing a little cash as a coping mechanism and as a way of survival for the most vulnerable. Male domination of cash crop farming places women as secondary players in the agriculture sector notwithstanding their great contribution to the sector through labor. Mathiassen et
al. (2007) highlight the disparities in access to more gainful employment between men and women as they noted that:

Both for men and women, doing “mlimi” or subsistence farming, is by far the most important type of employment, and more so for women than for men. It is also shown that men more often than women carry out income-generating activities that have the possibility of generating some cash. Men more often than women worked in own business outside the agricultural sector did some “ganyu” (casual work) or worked for a wage or salary. Not only did men more often participate in those activities, but also worked more hours than women in each of them, again creating gender disparity when it comes to access to cash remuneration for work (Mathiassen et al. 2007: 12).

The exclusion of women from work outside agriculture also relates to the concept of “women’s triple role” (Moser 1993 cited in March et al. 1999). It refers to the reproductive, productive, and community managing activities that women assume and that affect how they set priorities. Thus, this concept theoretically argues that any development intervention in one area of work will affect the activities performed in the other two areas (March et al. 1999). For example, women’s work in reproductive, community and some productive roles often take up most of their time and exclude them from their involvement in productive roles. Thus, this implies that when women do participate in productive roles, such as formal employment, “the additional time spent on farming, producing goods, attending training sessions, or meetings will result in less time spent on other reproductive tasks such as child care or food preparation” (March et al. 1999: 57). In an agricultural setting, this “triple role effect” is evident by the fact that even when women have the opportunity to take part in agriculturally productive, cash-earning roles, they mostly do so for fewer hours as compared to men, thus directly affecting their earnings from such activities. In addition, the 2004 National Statistical Office Integrated Household Survey 3 results show that Malawi has high fertility rates (NSO 2004). This means that women spend even more time in reproductive roles thus further limiting their time for productive roles. The high number of children born means that women would have more work looking after small children adding more tasks and chores to women’s daily activities.

Gender roles influence household’s labor constraints and therefore, the probability of adopting new agricultural technologies in communities where women and men perform different tasks or have differential access to household or hired labor. Malawi farm households depend on household members to fulfill most of the labor requirements for crop production. Hired labor is limited, averaging only 2.2 days per farm plot per year, according to the findings of the Integrated Household Survey 3 (IHS3) (Fisher and Kandiwa 2014). Female household heads hired fewer laborers to work their plots than did women and men in male-headed households (MHH). The Malawi IHS3 collected information on the numbers of elderly (65 years), adult male and female (15–64 years), and child (6–14 years) household members engaged in three categories of agricultural tasks: land preparation and planting; weeding, fertilizing, and other non-harvest activities; and harvesting. Female headed households (FHHs) and women in MHHs generally engage in more tasks than men (NSO 2004).

Labor constraints are likely to be more pronounced in FHHs, which tend to be smaller and contain fewer adult males than MHHs. The strategic gender assessment report mentioned in the introduction of this current report validates the above observations by emphasizing that the multiple demands on women’s labor illustrate the critical role women play in the
maintenance of household and national economies (Ngwira, Kamchedzera, and Semu 2003). Most Malawian women live in rural areas where they produce their own food, goods, and services while at the same time exchanging some of their commodities on the market for cash. In order to accomplish this, the average length of a rural woman’s day varies between 16 and 17 hours in which she is engaged in cultivating, food processing, childcare, and housework (Kaufulu 1992). Women therefore have to wake up early in order to accommodate both agricultural work and household maintenance tasks. This labor trend is applicable in both patrilineal and matrilineal settings of Malawi. It must also be noted that even for urban women who are employed in the formal sector, employment does not lead to a substantial redistribution of household maintenance tasks between the sexes but rather to a redistribution of tasks among women in the household, especially older daughters (Semu and Binauli 1997).

The ability to purchase labor and the amount of time spent selling it is another critical element in gender dynamics in Malawi. Casual labor—locally known as ganyu—is when individuals sell their labor for payment. On one hand, the buying and selling of labor is important for agricultural production. The ability to purchase labor directly contributes to agricultural productivity. However, women who spend more time selling labor do so at the expense of their own individual agricultural activities. Kilic et al. (2015) highlight that in the context of Malawi and Tanzania FHHs are limited in their use of adult male labor. They further note that female plot managers try to compensate for these deficiencies with higher levels of household adult female labor, household child labor, and exchange labor, but this is not enough to overcome the differences in productivity. Capital constraints highlight the importance of gender dimensions in accessing labor and in the complex ganyu institution.

Concurring with the findings above, Simtowe’s (2010) study on livelihood diversification and gender in Malawi concludes that MHHs are likely to use more inputs and labor-intensive technologies to maximize agricultural production compared to FHHs. Thus, women-headed households in both patrilineal and matrilineal settings of Malawi (which includes Dedza and Ntcheu in this case) face labor constraints and are overburdened with both reproductive and agricultural tasks. Other studies have also shown that intra-household division of labor is not as straightforward as we have been led to believe. For instance, Bezner Kerr’s (2005) findings shows that labor patterns within households are socially mediated and involve bargaining of workloads between male and female members of that particular household. Bezner Kerr further argues that, despite this bargaining labor element, women still appear to have greater workloads than men in both reproductive and agriculture-related tasks.

How proceeds gained from agricultural production in the face of unequal labor contributions and constraints within households is the next quest that this literature review addresses.

**Allocation of benefits from agricultural production**

Access to resources, information, decision-making as well as participation and benefit sharing are all characterized by an element of gender across all tribal groups in Malawi. In most cases, the gender dimension is such that one gender benefits at the expense of the other due to unequal power relations that are prevalent in most circumstances. The fact that men tend to have more access to cash gives them greater structural power within households (Bezner Kerr 2005). Furthermore, despite the critical role that women play in agricultural production, researchers tend to agree that women benefit less in terms of agriculture-related credit, access to inputs, and overall proceeds of their labor (Chirwa et al. 2011; Bezner Kerr 2005; Simtowe 2010).
Intra-household resource allocation within Malawian rural households is a complex matter due to social-cultural differences across the country. However, there is general perception that when men control resources, they tend to use them for individual purposes such as beer at the expense of the welfare of the household (Chirwa et al. 2011). Furthermore, Chirwa et al. also observe that there are instances where household resources are personalized and hence the concerned household member controlling such resources has sole decision-making power over the resources. However, other researchers have observed collective decision-making in terms of the division of income from agricultural proceeds, even though men have an upper hand in directing such decisions (Chirwa et al. 2011; Fisher and Kandiwa 2014; Simtowe 2010).

Overall, the trends observed above are prominent in both patrilineal and matrilineal settings of Malawi, even though women in matrilineal settings have more bargaining power to access benefits accrued from agricultural production (Bezner Kerr 2005; Zuka 2015). The fact that FHHs are less productive and are likely to diversify to ganyu at the expense of their own plots (Chirwa et al. 2011), highlights the predicament of women in different farming systems (be it matrilineal or patrilineal). However, it is important to note that not all studies show that FHHs are always disadvantaged in terms of access to land, livestock, other assets, credit, education, health care, and extension services amongst other resources. For example, a 1999 IFAD report shows that out of 19 countries in sub-Saharan Africa, the incidence of poverty among FHHs is lower in about nine countries.

A look at how access to extension services further narrows the gap of benefiting from agricultural production and influences adoption or adaption of technologies is discussed in the next section.

**Access to agricultural information and extension services**

Development experts have emphasized that agricultural extension is crucial in achieving agricultural development, poverty reduction, and food security (Feder et al. 2011). Presently, in Malawi, the training and dissemination of information relies heavily on an agricultural extension system of government workers who communicate new practices to individual farmers in villages. Approximately 50% of government extension officers’ positions in Malawi remain unfilled. Most farmers do not have access to agricultural extension services. The few available extension workers are being stretched beyond their geographic capabilities. This severely fractured structure of official communication about new technologies has had a ripple effect on the transfer of knowledge about agricultural advancements. The resulting failure of information transmission may be one of the key constraints preventing poor rural farmers from adopting more productive agricultural techniques developed by the latest research (Leeuwis 2013).

Information transferred to farmers not only needs to be of quality and timely, it also needs to be gender-sensitive and context specific in order for them to adopt newly introduced technologies. As Simtowe (2010) and Gladwin (2000) rightly note, there is a need to understand how men and women access agricultural information as well as how they utilize that information.

Several studies have shown how extension services and their benefits are extremely skewed toward one gender. Men tend to monopolize contacts with extension agents and are likely to control access to extension services due to male dominance in the public as well as private spheres (Chirwa et al. 2011; Mathiasssen et al. 2007; Simtowe 2010). In their study, Mathiasssen et al. (2007) found that that only seven percent of FHHs received advice from
agricultural extension workers, compared to thirteen percent of the MHHs. However, Mathiassen findings did not further disaggregate the composition of MHH by gender, making it difficult to know whether women in MHH are much better off in terms of access to agricultural extension services compared to women in FHH. Other studies, such as IFAD (1999), have established that female heads access training and extension services more easily than women from MHH due to their autonomy in making decisions. How these gender disparities in terms of access to extension services and information affect the adoption of new agricultural technologies by both male and female farmers in the Africa RISING program was an area the evaluation team was interested to explore.

Agricultural extension officers and researchers alike need solid knowledge to deal with a wide range of gender-relevant challenges regarding the relationship between agricultural technologies and information access by male and female farmers. As Fisher and Kandiwa (2014) rightly note, another possible reason why gender of the farmer influences adoption of modern crop technologies or varieties is that men and women have different preferences for variety characteristics. Consequently, since breeders typically do not consult female farmers, modern varieties generally do not match the specific criteria of women farmers (Lunduka et al. cited in Fisher and Kandiwa 2014: 107). It follows from this that, since the agricultural sector is evolving and current trends in improved communication technology are underway, extension officers and researchers will need to match the gained momentum by developing and advancing gender sensitive and context-specific agricultural technologies and extension approaches.

Adoption and adaptation of technologies
Gender relations and disparities in the condition and position of women affect the adoption of agriculture technologies in most parts of Africa and beyond (Doss and Morris 2001). Resource-poor farmers, most of whom are women, often fail to adopt technologies that would improve productivity and give better yields. There are several factors that influence the adoption of technology most of which are deeply tied to the gender dimension in agricultural production. For instance, farmers often cite lack of capital as a major reason for not adopting technologies that could improve their productivity (Croppenstedt et al., 2013). Ineffective rural financial markets can prevent farmers from borrowing to invest in a new technology and from insuring against the risks associated with experimenting with a new technology. These constraints are likely to be greatest for agricultural technologies that impose upfront costs for switching. Financial barriers add to a lack of credit access. For example, in multiple settings, financial products that allow individuals to commit to future saving or investment at a moment when they have cash, such as immediately following the harvest, improve adoption and other outcomes (Duflo et al., 2008). In addition, lower adoption levels among female farmers could reflect intrinsically higher risk aversion among women, and less willingness to take on the inherent risks that new agricultural technologies entail (Feder et al., 1985 cited in Fisher and Kandiwa, 2014:108).

Decisions over land, a responsibility that generally lies with men, also affect the adoption of technologies vital for increasing productivity or conserving land resources for sustainable production. The Government of Malawi reports few gender disparities in land holding (NSO 2004). However, FAO data indicates that only 32% of individual holders for agricultural land are women. It further reports that despite the significant numbers of women owning land in matrilineal communities, gender inequalities in land access and ownership are overwhelming (Food and Agriculture Organization, 2011). These claims were cemented by
what the National Census on Agriculture and Livestock (NACAL) (National Statistical Office 2010) found, namely that FHHs and female farmers had less land than their male counterparts. Nearly half of FHHs compared to one quarter of MHHs, have holdings of less than 0.5 hectare. This indicates that female farmers would have a lower drive to adopt and adapt technologies or would only do so as late adopters given that they would not want to take chances with their small piece of land.

Labor allocations also have implications for technology adoption. Both the accumulation and allocation of human capital such as skills and abilities to utilize own labor as a resource plays an important role in technology adoption. Inefficiencies in allocation of labor directly affect incentives to adopt new technologies. The interaction of labor and technologies is two ways as some technologies are also meant to save labor, which could be for the benefit of women as they would have more time to take part in other productive activities. Furthermore, Huffman and Orazem (2007) also noted that profitable technologies could increase the productivity of labor and allow for more off-farm labor income. However, as already noted by other scholars, labor-intensive technologies might also drive away farmers to adopt such technologies. For instance, Fisher and Kandiwa (2014:103) ascertain that gender roles can influence a household’s labor constraints and, therefore, the probability of adopting new agricultural technologies in societies where women and men perform different tasks or have differential access to household hired labor. Fisher and Kandiwa further note that within Malawian rural households, FHHs were more disadvantaged in terms of access to adult labor compared to wives in MHHs. These findings imply that FHHs with small pieces of land and facing labor constraints are less likely to adopt new agricultural technologies than their counterparts in MHHs.

Ironically, the same study by Fisher and Kandiwa also found out that women in rural Malawi make decisions related to crop choice, input use, and agricultural activities mainly when they are unmarried and are the household head. For instance, wives in MHHs were found to be decision makers for only 5% of the farm plots, while the corresponding figure for FHHs was 22% (Fisher and Kandiwa 2014). This is in agreement with Chirwa et al. (2011) who ascertain that females in MHHs tend to have little control over farming decisions. The implication of these observed intra-household decision-making dynamics on adoption or adaption of agricultural technologies is that FHHs are more likely to make their own decisions whether to adopt a technology or not, unlike their counterparts in MHHs.

Another aspect that has been found to affect adoption of agricultural technologies between men and women is the choice of crop. Previous studies have comprehensively documented how male farmers tend to value adoption of crops that have potential to generate income, while female farmers tend to value crops as a food source (Bezner Kerr 2005; Bezner Kerr 2008; Chirwa et al. 2011; Hockett and Richardson 2016). While many researchers tend to agree on the above assertions, there is still scanty documentation on how members of different types of households (i.e., MHH, FHH, or polygamous headed households) actually deal with intra-household gender dynamics in making their final decision on what agricultural technologies to adopt or adapt.

The importance of the literature reviewed above for this Africa RISING gender study is precisely that the literature brings to the fore issues of labor, intra-household decision-making processes, access to information, access to land, and other resources, that have a substantial effect on technology adoption. Though, there is scanty literature specifically for Dedza and Ntcheu districts on how the aforementioned aspects intersect and affect adoption and adaption of technologies, the general literature presented above reveals the
complexities of agricultural technology adoption and the need for policy makers and researchers to consider such complexities in their activities. As Chirwa et al. (2011:6) put it, “intra-household issues are complex and the extent to which males dominate over control and allocation of resources varies from one transaction to another and from one district to another”.

It follows from this that in the quest to find out what drives farmers (male or females) to adopt and adapt newly introduced technologies, one must seek an understanding on how farmers combine new ideas with their own local knowledge in different social and geographical settings. The result of such a quest could be the promotion of gender-sensitive and culturally relevant technologies that are not only potentially beneficial at multiple levels, but also readily adopted by project participants (Hockett and Richardson 2016).
Methodology
This section describes the methodology used in this study. It provides details of the study sites, the design, and methods including the tools that were employed to collect primary data from the Africa RISING study communities and the major limitations of the study.

Study area
This study was carried out in the Central region of Malawi, covering two bordering districts of Dedza and Ntcheu. Africa RISING has been working with communities in these two districts since 2011, particularly in four Extension Planning Areas (EPAs) of Kandeu and Nsipe in Ntcheu District and Linthipe and Golomoti in Dedza district. The four EPAs vary in geophysical features as Malawi’s land surface straddles the North-West to South-East, low-to-high elevation parts of the African rift valley (Brown and Young 1965). The varying geographical gradient and climatic conditions play a role in influencing productivity.

Kandeu and Nsipe are medium agricultural potential sites, located on medium elevation, with medium rainfall while Linthipe is a high agricultural potential site, located on high elevation, and receives well-distributed rainfall. Golomoti is a low agricultural potential site located at low elevation, with high evapo-transpiration and variable rainfall (Smith et al. 2016, Tamene et al. 2016).

Sampling approach
Focus group discussions and key informant interviews
The Agricultural Extension Development Coordinators (AEDCs) purposively selected farmers to be interviewed from their respective EPAs. They came from various villages within the EPA and comprised farmers hosting mother or baby trials under the Africa RISING project. For livestock, participants were selected from the dairy bulking group in Dedza and from farmers doing research on goat feeding with LUANAR in Golomoti EPA.

The respondents for key informant interviews (KII) were selected from all partners engaged with Africa RISING as well as from the extension staff at national, district, and EPA levels (see section 3.2.3).

The primary data collection was undertaken by a team of three consultants (two females and one male) and a research assistant taking notes on the process as well as the content of the meetings in Chichewa during the month of October and part of November 2016. As shown in Table 2, a total of 11 (FGDs) were conducted from four EPAs in the two districts covering six female and five male groups. On average, each focus group had about 15 members and discussions took about 2 hours. Upon arrival in the village, local extension staff introduced the consultants. The team leader then briefly explained the objectives of the meeting. This included establishing female and male farmers’ awareness of the Africa RISING project and the role of women in Africa RISING activities.

The male consultant facilitated all the male FGDs while the female consultants facilitated the female FGDs. Before each interview, permission was sought to record the discussion and all the groups visited accepted the request.

In Linthipe EPA, FGDs were carried out with two dairy groups (one female and one male) from Dzaonewekha milk bulking group. The farmers came from 22 villages covering a radius of 10-15 km from the meeting place. FGDs were also conducted in the same EPA covering
another two groups (one female and one male) who are hosting mother and baby trials on grain and legume crops. The meetings took place in Mbidzi village. The participating farmers came from five surrounding villages. In Golomoti EPA, three FGDs were conducted. There were two groups (one female and one male) whose members were either mother or baby trial farmers dealing with crop knowledge products. A third group was engaged in goat production and was represented by two female mother farmers and a male farmer. The participating farmers came from eight surrounding villages and the meetings took place at Golomoti EPA office.

In Kandeu EPA, two FGDs (one female and one male) were conducted with farmers hosting mother and baby trials of various crop knowledge products from 13 surrounding villages.

Finally, in Nsipe EPA, two FGDs were conducted covering female and male groups separately. These farmers came from seven different villages. They were all categorized as either mother or a baby farmers based on the type of trial each hosted.

**Figure 1:** Group discussion gatherings and key informant interviews.
Demographic data
At the end of each FGD the team captured demographic data from each individual farmer separately. The data captured included: sex of the respondent, age, marital status, household size, marriage and settlement pattern, land holding size, land ownership pattern, and role of respondent in Africa RISING project.

Table 2: Study communities by district, EPA, gender group, and number of farmers.

<table>
<thead>
<tr>
<th>District</th>
<th>EPA</th>
<th>Gender of group</th>
<th>Number of farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTCHEU</td>
<td>Kandeu</td>
<td>Women</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Nsipe</td>
<td>Women</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>13</td>
</tr>
<tr>
<td>DEDZA</td>
<td>Linthipe</td>
<td>Women</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Women - dairy</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Men - dairy</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Golomoti</td>
<td>Women</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixed – goats</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>148</strong></td>
</tr>
</tbody>
</table>

Source: Fieldwork 2016.

Key informant interviews
A total of 23 key informants were interviewed (Annex 1). Out of these informants eight were females. The TOR specified the different stakeholders to be interviewed and thus guided the choice of the key informants. They included:

- Traditional leaders from each of the four EPAs, specifically from the area or village where the FGDs were taking place. A specific interview guide was developed for them. The interview was conducted in Chichewa the dominant vernacular language.
- Local extension workers, officially known as Agriculture Extension Development Coordinators (AEDCs) and Agriculture Extension Development Officers (AEDOs) who are in charge of an EPA and sections, respectively, were interviewed in English. However, it transpired that during our visit, most of the local extension workers in Kandeu, Nsipe, and Golomoti who had worked with Africa RISING for the previous years had been interdicted such that the ones we interacted with were relatively new with the exception of Nsipe where the interdicted AEDO accepted to accompany us to the field.
- At district level the team interviewed the District Agricultural Development Officers for the Dedza and Ntcheu districts. The interview was held in English.
- At national level, the Deputy Director of the Department for Agriculture Extension Services and gender officer were interviewed together in English.
- With regard to partners, key informant interviews were done with CIAT and World Agro-Forestry, the CGIAR centers. Two scientists, one from each partner, participated in the interviews.
- The team also interviewed two researchers at LUANAR and three Masters degree students conducting research supported by Africa RISING from the same institution.
Key informant interviews were also conducted with the Africa RISING national coordinator and two research associates who were major keys in providing clarification and helped us put into perspective some of the information we got from partners and farmers. The Africa RISING coordinator and research assistants provided us with the research protocols used in the intensification process.

Development of study tools

This study relied solely on qualitative methods for data collection as per the TOR. Qualitative research provides an in-depth and detailed understanding of meanings, actions, non-observable phenomena, attitudes, intentions, and behavior (Gonzales 2008 in Cohen et al. 2011: 45). Mayoux and Mackie (2009) claim that qualitative analysis is essential for establishing existing inequalities and their causes, power dynamics at play along the value chain, and points of convergence and divergence of interests among actors.

To this end a FGD guide for female and male farmer groups was developed and edited with feedback from the Africa RISING supervisory team for this study (Annex 2). Similarly, three sets of interview guides for semi-structured interviews with key informants were developed and edited for the different levels of key informants described above, i.e., researchers, extension workers, and community leaders. The interview guides were largely informed by the evaluation questions in the TOR but also by contextual knowledge gained through the literature review and the consultants’ experience. Ranking exercises were incorporated in the FGD guide for the farmers to rank the different knowledge products and practices introduced by Africa RISING.

The FGD interview guide for both female and male farmers’ groups covered similar issues. They can be summarized into six key sub-topics, namely gender demography; access to productive resources; research products introduced by Africa RISING; criteria used by farmers to evaluate new agriculture practices for suitability; adoption and adaptation of new agriculture practices; and sources of information about agriculture practices and management.

Data analysis

The team largely used qualitative content analysis to draw meaning from notes captured from the FGDs and KIIs and the transcriptions. As part of the analysis, the consulting team held daily reflection meetings after conducting FGDs and KIIs. This helped to tease out key issues coming from the interviews and to identify any gaps for follow up. The reflection meetings also served as checkpoints for whether the responses addressed the key research questions of the study.

Validation meetings with FGDs were held in all the sampled EPAs and specific gaps in the data were filled during second meetings at EPA level. A stakeholder validation workshop was held in Lilongwe where fifteen participants attended and their feedback was incorporated in the report.

The individual demographic data of the 148 FGD participants were analyzed using Statistical Package for Social Scientist (SPSS) 21.0 through descriptive statistics and presented as frequencies and cross tabulation.
Limitations of the study

All the traditional leaders that were interviewed as key informants were males. It is assumed that if there were female traditional leaders interviewed as key informants, this could have added a different perspective to the information gathered. However, the team feels that such information was captured from other female participants and key informants such as the female AEDCs in Golomoti, Nsipe, and Dedza as well as the female DADO in Ntcheu District.

A study of this nature requires one to stay longer in the communities to understand more through observations and to create rapport and trust with the communities before they can open up to share their experiences. However, by working through the extension staff that are in constant touch with the farmers, the team feels that the farmers were free to express themselves. The idea of having separate groups for women and men was a major key in getting each group to speak freely, as most women would be shy to speak in a mixed group.

As pointed out in section 3.2.3, the team found that at the time of the study most of the government extension workers that had been working with Africa RISING had been interdicted. Therefore, we had to work with relatively new staff that did not yet have a solid understanding and background of the project. Although this was the case in Nsipe, the interdicted staff still managed to accompany us to the meeting place where FGDs were carried out.

The team was unable to conduct 12 FGDs as stipulated in the TOR. In Golomoti we had planned to have two FGDs on livestock (goat feeding trials), one with female farmers and another one with male farmers. However, the government extension staff at EPA informed us that the goats for experimentation were given to two female farmers only. For this reason, a male group could not be constituted.
Discussion of findings

This section presents the main findings of this study emanating from the empirical data gathered through FGDs, KIs, observations, and literature review. Firstly, it presents the general demographic characteristics of both female and male farmers that took part in the FGDs that were conducted in the four EPAs of Linthipe, Golomoti, Kandeu, and Nsipe. This is followed by a discussion and presentation of the findings, organized according to the key research questions, which guided the study as stipulated in the study TORs.

Demographic characteristics of the respondents

As mentioned in section 3.2.2 of the methodology, a total of 148 farmers participated in the interviews. We captured demographic information of the respondents such as age, sex, marital status, family size, land ownership, religion, and others to be taken into account when interpreting their responses. Table 3 provides information on some of the key demographic characteristics. There were more female farmers (55.4%) compared to male farmers (44.6%) interviewed through FGDs. This was reflected across all the groups we visited in the four EPAs with exception of the dairy group in Linthipe EPA where there were more male farmers (58.6%) than female farmers (41.4%). An explanation given for the Linthipe situation was that, in most cases, elderly female farmers tend to send young men to deliver milk for them to the bulking group plant due to long distances as some have to cover between 10 and 15 km. Usually meetings are held at the milk bulking group plant after the farmers have delivered their milk early in the morning. The observations that the team made on elderly female farmers who are members of the dairy group being represented by young men would suggest that these young men take decisions on behalf of the women and this has implications on who and how the women owners of the dairy cows benefit.

Table 3: Demographic information of individual farmers covered in the FGDs.

<table>
<thead>
<tr>
<th>Kandeu</th>
<th>Nsipe</th>
<th>Linthipe Dairy</th>
<th>Linthipe</th>
<th>Golomoti</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>19.0</td>
<td>55.9</td>
<td>13.0</td>
<td>5.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Male</td>
<td>15.0</td>
<td>44.1</td>
<td>13.0</td>
<td>5.0</td>
<td>17.0</td>
</tr>
<tr>
<td>Total</td>
<td>34.0</td>
<td>100.0</td>
<td>26.0</td>
<td>100.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Type of marriage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monogamy</td>
<td>29.0</td>
<td>96.7</td>
<td>23.0</td>
<td>100.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Polygamy</td>
<td>1.0</td>
<td>3.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>30.0</td>
<td>100.0</td>
<td>23.0</td>
<td>100.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>30.0</td>
<td>88.2</td>
<td>23.0</td>
<td>88.5</td>
<td>18.0</td>
</tr>
<tr>
<td>Single</td>
<td>1.0</td>
<td>2.9</td>
<td>2.0</td>
<td>7.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Widowed</td>
<td>3.0</td>
<td>8.8</td>
<td>1.0</td>
<td>3.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Divorced</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>34.0</td>
<td>99.9</td>
<td>26.0</td>
<td>100.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Marriage settlement pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matrilocal</td>
<td>30.0</td>
<td>88.2</td>
<td>19.0</td>
<td>73.1</td>
<td>17.0</td>
</tr>
<tr>
<td>Patrilocal</td>
<td>4.0</td>
<td>11.8</td>
<td>7.0</td>
<td>26.9</td>
<td>10.0</td>
</tr>
<tr>
<td>Missing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>34.0</td>
<td>100.0</td>
<td>26.0</td>
<td>100.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Type of household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FHH</td>
<td>5.0</td>
<td>14.7</td>
<td>5.0</td>
<td>19.2</td>
<td>8.0</td>
</tr>
<tr>
<td>MHH</td>
<td>29.0</td>
<td>85.3</td>
<td>21.0</td>
<td>80.8</td>
<td>21.0</td>
</tr>
<tr>
<td>Total</td>
<td>34.0</td>
<td>100.0</td>
<td>26.0</td>
<td>100.0</td>
<td>29.0</td>
</tr>
</tbody>
</table>

Source: Field data 2016.

With regard to marital status, the majority (79.1%) of the participating farmers were married, 10.8% were widowed, 6.7% were single or not married while 3.4% were divorced (Table 3). For those that were married, most of them (91.7%) were in monogamous.
marriages while the remaining 8.3% were in polygamous marriages. The study also found that about 21% of farmers interviewed were from FHHs, while the remaining 79% were from MHHs. The figures on marital status, however, do not necessarily reflect the situation on the ground. Usually, women in Malawi may not disclose that they are not married because such information would not put them in good standing in the community. One of the key informants stated that women in Central Malawi would divorce and remarry three or more times to fulfill the demand of society to gain respect.

In terms of marriage settlement patterns, about three quarters (75.6%) of the participating farmers indicated that they practiced the matrilocal settlement pattern, whereas 21% were following the patrilocal system where the couple settles in the husband’s home or community. A few (3.4%) of the interviewees did not respond to this question.

**Age of respondents in the FGDs**

Some of the participants (31%) were either unable to indicate their age or they did not know their age. The minimum age of the participants was 23 years while the maximum age was 75. The mean age for the group was 43.9. Participants in the FGDs in Linthipe EPA, those experimenting with crop knowledge products, had the lowest mean age of 40.9 followed by Gomoloti (42.4).

**Land ownership and use**

**Table 2:** Ownership of land cultivated by farmers covered in the FGDs.

<table>
<thead>
<tr>
<th></th>
<th>Kandeu EPA</th>
<th>Nsipe EPA</th>
<th>Linthipe Dairy</th>
<th>Linthipe EPA</th>
<th>Golomoti EPA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wife</td>
<td>24.0</td>
<td>72.7</td>
<td>15.0</td>
<td>60.0</td>
<td>5.0</td>
<td>22.7</td>
</tr>
<tr>
<td>Husband</td>
<td>5.0</td>
<td>15.2</td>
<td>9.0</td>
<td>36.0</td>
<td>6.0</td>
<td>27.3</td>
</tr>
<tr>
<td>Both</td>
<td>4.0</td>
<td>12.1</td>
<td>1.0</td>
<td>10.0</td>
<td>45.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Parent s</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.0</td>
<td>4.5</td>
<td>-</td>
</tr>
<tr>
<td>Rented</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.0</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>25.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>22.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Field data 2016.

With respect to land ownership, the team asked each participating farmer about who owns the land they currently cultivate. A total of 139 farmers responded to this question. The majority (60.4%) indicated that the wife or the woman owned the land cultivated, 23.7% indicated that the husband owned the land while 14.4% reported that both (wife and husband) owned the land. One respondent reported that “his/her” parents owned the land while another participant indicated that the land cultivated was being rented. The higher percentage of land being owned by women can be explained by the marriage settlement pattern practiced in the two districts of Dedza and Ntcheu where most marriages (75.6%) follow matrilocal settlement pattern as has already been explained. These findings concur with studies that also focused on how most women in matrilineal settings own land (Hirschmann and Vaughan 1983; Hirschmann and Vaughan 1984; Englund 1999; Vaughan 1987; Chirwa et al. 2011; Zuka 2015).

The discussions with local leaders, key informants, and participants of FGDs confirmed that land is acquired through customary inheritance and through local traditional leaders. Parents and maternal uncles preside over the allocation and or distribution of land. In all the FGDs and KIIIs it was noted that there is a gender imbalance in the acquisition of land. The land is inherited through female lineage; it is the girl child who is eligible to inherit the land from the mother. It is understood that the male children will get married and join another family so are not eligible for acquisition and ownership rights to land with exception of unique cases such as chitengwa where the man settles in his own village. In the FGDs, male
participants indicated to have access to their wives’ land through marriage with a few exceptions where young couples had parcels of land in the man’s and the woman’s villages or others who had bought or rented land from persons who live and work in urban areas. This poses great challenges to gender dynamics in the use and ownership of land when divorce and death happen. In the following excerpt, one Golomoti respondent clearly summarized what many men said.

“The difference is that the land that you found at a place where you married, if the wife dies a man leaves the land behind and moves - but if the land was acquired as a couple, when the man dies the woman remains with the land or if the wife dies the man remains with the land. This means that in the end the land belongs to the children with the female children having an upper hand of owning the land”

(Golomoti male FGD, 3/11/2016)

**Evaluation criteria used by female and male farmers**

This section responds to evaluation question 1 as detailed in the TOR. Specific questions are: *Which criteria do female farmers, heads of household and married, use when evaluating new agricultural practices for suitability? And why? Which criteria do male farmers use when evaluating new agricultural practices for suitability? And why? How can gender differences in evaluation criteria be explained?*

**Criteria used by female farmers when evaluating new agricultural practices**

This section provides the criteria used by female farmers when evaluating agriculture practices for suitability according to the participants in the study. Overall, the team found that women use different criteria than men when evaluating new agriculture practices for suitability. Consequently, the team noted more similarities among female farmers in the evaluation criteria they use across all four EPAs that were visited with a few differences noted. The main criteria often mentioned by female participants in the study included: (i) food security especially in terms of relish, (ii) high yielding varieties, (iii) early maturing crops, (iv) marketability of the crop, (v) multiple usage of the crop, (vi) ease of management of the crop, i.e. not requiring spraying or much labor, and (vii) easy to cook.

**Food security:** This was found to be one of the critical criteria for evaluating new agricultural practices according to most of the female participants in the study except for those that were doing dairy production. Key informants, particularly the traditional leaders, government extension staff (DADOs and AEDC), and CIAT, confirmed food security as a pertinent criterion used by most women farmers. In almost all the female FGDs, this criterion was ranked first. The female participants indicated that they choose crops that would make the household food secure largely because of the roles they play at household level. They were concerned with the welfare of their households and food was a key issue. Therefore, legume crops such as cowpea used for relish were highlighted as being critical. Groundnut, which can be roasted and eaten as a snack or boiled as a relish and whose flour is an additive to vegetables, was highlighted as a priority legume for female farmers. Maize was also considered important for overall household food security.
**High yielding varieties:** Since the focus of women is on food security as explained above, women farmers selected varieties that would bring more yield. This was observed especially for bean varieties promoted by CIAT. The female participants stated that women had more interest in high yielding varieties so that they can have an adequate reserve for home consumption.

**Early maturing crops:** Duration to crop maturity was also an important criterion for women, according to the female FGD participants. This is because the months of January, February, and March are generally a lean period when most households run out of food. Consequently, crops like beans and improved cowpea varieties that only take about two months to mature were regarded as suitable for survival, as women start plucking a few leaves for relish and then the actual pods after harvest while other crops are still in the field.

**Marketability of the crop:** The female participants also highlighted the ease of selling a crop as one of the women’s important criteria for choosing a new agricultural technology or crop as suitable to grow. They indicated that crops like soybean and groundnut are very easy to market as vendors come right to their doorstep to buy whatever quantity is available.

**Multiple usage of the crop:** Female participants indicated that women find crops like soybean and groundnut very suitable since they can be used in many ways. Female participants reported that Africa RISING had shown them different ways of processing and utilizing soybean such as making porridge and soymilk and in baking. Additionally, children seemed to like the products made from soybean hence reducing malnutrition. The same was mentioned for groundnut, which can be eaten as a snack, added to vegetables as a flour to improve the taste of the relish, or can be processed to groundnut paste for different home uses. The female participants further indicated that although male farmers are exposed to value addition and processing of the soybean and groundnut products, they are hardly utilizing that information in their homes, since food preparation is still considered a woman’s affair.

**Ease of management of the crop or labor intensiveness:** According to female participants, women farmers do not like crops that require operations such as spraying and buying of chemicals, as they usually do not have adequate resources. For instance, most female participants in Kandeu EPA, Ntcheu indicated that crops like cowpea and pigeon pea require spraying to control insects especially aphids and diseases for the crop to perform well. This discourages most women from growing these crops. They also highlighted that Africa RISING does not provide insecticides and sprayers for spraying against insect attacks. In most communities spraying is considered a responsibility of men. While in Kandeu, Linthipe, and Nsipe EPAs cowpea and pigeon pea were less preferred due to the spraying requirement, the story was different for most of the female participants in Golomoti EPA. They mentioned cowpea as a preferred crop because of its early maturing and high yielding characteristics and their tendency to intercrop with maize.
This can be explained by the fact that Golomoti is a key cotton growing area and spraying is essential. Farmers in Golomoti have experience and knowledge of spraying including where to borrow sprayers.

In terms of labor intensiveness, we are in agreement with Simtowe (2010). Female farmers did not like practices that are too labor intensive and took this into consideration when choosing new agriculture practices. With regard to Africa RISING practices, FHHs and other female farmers had difficulties with the Sasakawa technology for maize production, especially the need to adjust their ridges from 90 cm to 75 cm apart. This requires a lot of labor, since it entails aligning the ridges by using ropes attached to pegs driven into the ground. One person alone cannot do this work. Therefore, in most cases female farmers (especially those from FHHs) have to wait for male farmers to finish adjusting/aligning their fields to 75 cm apart before they receive assistance. It also emerged during the female FGDs that FHHs usually select agricultural practices that do not require too much labor because often they cannot afford to hire extra labor in the form of ganyu. These findings concur with Mathiassen et al. (2007), who show disparities in access to and provision of ganyu among male and female smallholder farmers.

Quick to cook: Another important criterion used for choosing a particular technology or variety is the time it takes to cook. Most female participants in the study mentioned preference of crops/varieties that cook quickly such as cowpea, as they do not have to use a lot of firewood thus saving them from the drudgery of fetching fuel.

Criteria used by male farmers when evaluating new agricultural practices

This section describes the criteria that male farmers employ when evaluating new agriculture practices for suitability. It covers responses from the male participants’ FGDs in the four EPAs. The key criteria mentioned by the male participants were: (i) marketability of the crop, (ii) yield of the crop, (iii) food security, and (iv) availability of land.

Marketability of the crop: Both male and female participants often mentioned that men tend to opt for varieties that are preferred by the market, i.e., those that will sell easily. The participants from all sites indicated that the motivation for men is to make money. For instance, in Kandeu EPA, most of the participants in the male FGDs mentioned that men look for money so that they can use it to acquire tangible assets such as bicycles and radios and at the same time they also want to have surplus money for beer. The DADO for Ntcheu also confirmed that in both Kandeu and Nsipe, many men (he indicates about ¾) consume alcohol and thus divert resources from the households.

Yield of the crop: According to our findings, male farmers tend to select a technology based on the yield that they will get from it. Here the intention is to have as much yield as possible so that there is surplus to take to the market. For instance, legumes particularly beans, are considered a women’s crops but men come in when the yields are high and the crop is
fetching higher prices at the market. Male farmers tend to adopt crops that offer them both high yields and more income. With regard to how such income is shared within the household, participants of FDGs explained that in as much as husbands and wives plan together at household level on what to buy, some husbands use the remaining money for their personal gain.

“These days there are usually consultation between wife and husband on how to use income earned from crop and livestock sales or any other source but still the men tend to have an upper hand. For instance, after buying the key household necessities and there is a balance, it is mostly the men that keep the balance. This is where they take advantage to use it for their own gain, mostly beer drinking at the expense of future household needs.”

(KII Traditional leader Amosi village Nsipe, 27/10/16)

Food Security: In all male FGDs food security was mentioned as an important criterion for choosing a new technology though not all ranked it first. However, most of the male farmers in the four EPAs said they would consider new agriculture practices that can increase productivity and ultimately lead to food security. This was regarded as important, since society expects men to fend for the family. In this case, food security was synonymous with maize production.

“Everyman’s desire is to have adequate food for their household. Therefore, in deciding the suitability of the crop or variety to grow this plays a big role and the variety that gives higher yield is a priority because it results into household food security.”

(Golomoti Male FGD, 03/11/16)

Availability/size of land: Most of the male participants in this study indicated that the availability or size of land determines the practices/technologies that one can adopt. Both—men that have been exposed to Africa RISING crop knowledge products as well as dairy production — referred to this aspect. Those involved in dairy production indicated that planting fodder like Leucaena palida, Acacia, and Napier grass requires land and if one does not have adequate access to land, adoption might be difficult. Men engaged in crop products expressed the same sentiments.

Explanation of gender differences in evaluation criteria
As discussed in the previous section 4, most female participants indicated more concern over household food security as a priority since they had been brought up to take care of the home, i.e., reproductive roles as expounded by Kabeer’s (1994) Social Relations Approach. This is in contrast to most male farmers who tended to focus on the marketability of a crop produced with a technology.

Where male participants mentioned food security as criterion for choosing an agricultural practice, food was perceived in the context of maize availability. Female participants went beyond maize availability and included relish and other processed products for the family,
particularly the children. They also presented criteria that were not brought up by their male counterparts such as the time it takes to cook a crop/variety in question. This can be explained by women’s cultural responsibilities, which include fetching relish for Nsima, cooking, and rearing healthy children.

Other criteria such as the labor intensiveness or ease of management of an agriculture practice (highlighted by female participants and not featured by men) could be attributed to additional reasons. For instance, female participants indicated that women didn’t like crops that require frequent spraying. This could be due to the fact that women often cannot afford to buy chemicals for the spraying of crops and need to be literate since spraying chemicals requires one to understand the mixing procedures and sometimes calibrations to achieve efficacy.

While there were similarities among women’s criteria across all four EPAs, differences were also observed. The differences were noted in requirements for spraying. Whilst most female farmers from Kandeu, Nsipe, and Linthipe EPAs indicated that they did not prefer cultivating crops that require spraying, female farmers in Golomoti EPA had a different perspective. They claimed that spraying is not a challenge to them, that cowpea is one of their preferred crops, and that they are able to control pests and disease attacks.

Furthermore, the study also found that household decision-making may influence female heads of household and married women differently, when evaluating new agricultural practices for suitability. This is especially true for the implications of decision-making on use of land. For example, a man in a matrilocal union may demand that a bigger portion of the land be used for cash crops since he is interested in selling the produce. His wife is affected by such a decision since it limits her own decision on how to use the land. Additionally, women’s ownership of land is compromised by women’s physical needs (such as sexual needs) as well as the need to be seen as a married woman for the sake of social status. One female participant put it as follows: “As long as a woman wants to maintain an intimate relation with a man, she will always compromise and comply to a man’s demands”. This is in line with assertions made in the literature that despite women’s land ownership within matrilineal settings, control over decisions regarding that land are often made by men (Chirwa et al. 2011; Fisher and Kandiwa 2014; Mathiassen et al. 2007; Zuka 2015).

There was an exception in the pattern of land ownership in Linthipe, especially with Dzaonewekha dairy group. This group has been in operation for more than 20 years. Most male farmers who were involved in dairy farming had inherited land from their parents (about 35%) and married women from the same village so that they did not have to relocate to a different village. Some of the male farmers in the Lithipe/Dzaonewekha FGDs said that in some families a mother might have two male offspring and one female. Here the land can be passed on to the sons who will bring wives and farm on it. The female offspring will bring a husband to the village and they will farm in her land. It was not clear whether the fact that members of this focus group have cattle, which is considered as a sign of wealth, prevented them from marrying and settling in other places.
Adoption of new practices by female and male farmers

This section responds to evaluation question number 2, which has the following specific questions: Which practices have been/have not been adopted by male farmers? Which Africa RISING practices have been/have not been adopted by female farmers, heads of household and married? Why have female or male farmers adopted/rejected certain practices? What is the relationship between these decisions and gender dynamics in terms of labor allocation, income distribution, and access to resources and to information as well as other key aspects of gender analysis?

Practices/knowledge products introduced by Africa RISING

From the KIIIs with Africa RISING staff and extension staff, it was clear that Africa RISING has introduced a number of agriculture intensification practices that farmers have been testing in their respective fields using the mother and baby trial approach. Below is a description of the knowledge products that a typical mother trial contains and how the trials are managed. This is followed by a description and analysis of practices that have been adopted or preferred by female and male farmers. We conclude the section with an analysis of the gender differences in the adoption of the different practices/technologies.

Structure of the mother trial treatment as adopted from the Africa RISING research protocol

1. Maize control – no nutrients added
2. Maize fertilized with NPK compound (23-21-0) at 100 kg/ha at planting + top dressing urea at 100 kg/ha [FULL rate]
3. Maize fertilized with NPK compound (23-21-0) at 100 kg/ha + compost or manure (3-5 t/ha) at planting + top dressing urea at 100 kg/ha [FULL rate]
4. Groundnut fertilized with NPK at 50 kg/ha only [HALF rate]
5. Soybean fertilized with NPK at 50 kg/ha only [HALF rate]
6. Cowpea fertilized with NPK at 50 kg/ha only [HALF rate]
7. Pigeon pea fertilized with NPK at 50 kg/ha only [HALF rate]
8. Maize/pigeon pea intercrop fertilized with NPK compound (23-21-0) at 100 kg/ha at planting + top dressing urea at 100 kg/ha [FULL rate]
9. Maize/field bean intercrop fertilized with NPK compound (23-21-0) at 100 kg/ha at planting + top dressing urea at 100 kg/ha [FULL rate]
10. Doubled-up legumes A: Pigeon pea/groundnut intercrop fertilized with NPK at 50 kg/ha only [HALF rate]
11. Doubled-up legumes B: Pigeon pea/soybean intercrop fertilized with NPK at 50 kg/ha only [HALF rate]
12. Doubled-up legumes C: Pigeon pea/cowpea intercrop fertilized with NPK at 50 kg/ha only [HALF rate]
13. Doubled-up legumes D: Groundnut/cowpea intercrop fertilized with NPK at 50 kg/ha only [HALF rate]

N/B: The trial is replicated 3 times. Control of aphids in cowpea plots is prioritized with Dimethoate.

Baby trial formulation and management

According to the research protocol and discussion with Africa RISING technicians, the following process for setting up and managing the baby trials is:

- Action groups are formulated around each of the mother trials in all the intervention sites or EPAs under study.
• Action groups comprise at least 40 farmers, who actively participate in the establishment of the mother trials.
• Action group members subsequently establish baby trials based on the following rules:
  o No more than 4 treatments are to be selected from the mother trial they have established, with each treatment having a minimum plot dimension of 10 m × 10m.
  o Two treatments are mandatory
    ▪ Fertilized maize plot: Farmers are not given any fertilizer; they have to source using own resources, including fertilizers from the subsidy program.
    ▪ Doubled-up legume: Selection from any of those included in the mother trial.

During the FGDs, both female and male farmers were able to highlight practices/technologies that they liked or preferred most. The same were confirmed during the validation meeting where they also ranked technologies or practices they preferred most.

**Agricultural practices or technologies adopted or preferred by female farmers**
Female participants in Kandeu listed all the agricultural practices they could remember as having been introduced by Africa RISING (see below) after we had asked two questions: (i) what knowledge products have been introduced by Africa RISING through the mother and baby trials? (ii) What knowledge products/practices do you prefer most?

**Knowledge products introduced by Africa RISING as captured from the FGDs with Kandeu farmers:**
1. Doubling up of pigeon pea and soybean
2. Cowpea and groundnut
3. Adjusting their ridges from 90 cm intervals to 75 cm intervals
4. Planting maize using Sasakawa method and applying manure and fertilizer
5. Maize and pigeon pea intercropping
6. Making big ridges so as to retain moisture
7. Maize and soybean intercropping
8. Planting of 2 rows per ridge for the groundnut and soybean.

At this point it is important to note that Africa RISING is not directly promoting the Sasakawa method. However, some extension workers seemingly have decided to do so during Africa RISING activities with farmers. Therefore, in conversations farmers often associated the Sasakawa method with Africa RISING (see point 4 above).
Table 5: Practices adopted or preferred by female farmers in order of preference.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Kandeu</th>
<th>Nsipe</th>
<th>Linthipe dairy</th>
<th>Linthipe</th>
<th>Golomoti</th>
<th>Golomoti (goats)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Groundnut and soybean intercropping</td>
<td>Maize using Sasakawa method and pigeon pea</td>
<td>Milk products (paneer, yoghurt and chambiko)</td>
<td>Beans pure stand dwarf varieties</td>
<td>Maize and cowpea intercropping</td>
<td>Feeding goats <em>Gliricidia sepium</em></td>
</tr>
<tr>
<td>2</td>
<td>Pigeon pea and soybean intercropping</td>
<td>Groundnut planted on double rows</td>
<td>Groundnut – double rows</td>
<td>Groundnut and cowpea</td>
<td>Feeding <em>Faidherbia albida</em></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Maize using Sasakawa and fertilizer</td>
<td>Soybean planted in double rows</td>
<td>Soybean production</td>
<td>Soybean and pigeon pea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cowpea production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Maize Sasakawa and bean intercropping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With regard to the adoption of new agricultural practices by female farmers in the four EPAs, we found that in Kandeu EPA female farmers preferred three practices in the following order of priority: (i) doubled up groundnut and soybean, (ii) doubled-up pigeon pea and soybean, and (iii) maize production using the Sasakawa method with manure and fertilizer application. Farmers stated that they preferred the doubled-up legume because on the same field one is able to harvest two legume crops while improving the fertility of the soil. They also indicated that they easily access seed for the legumes, as Africa RISING is able to provide. The seed is recycled and planted in their other fields in the subsequent season; although in the year of this study (2016) due to drought and hunger they were not able to keep the seed. They also explained that they preferred the Sasakawa method of production though it is time consuming during planting and fertilizer application, but it results in increased yield. In terms of access to fertilizer, they indicated that they usually rely on the government fertilizer subsidy that they receive every year and that helps to adopt such farming practices.

In Nsipe EPA the pattern of practices preferred or adopted by female farmers was similar to that of Kandeu EPA according to the participants of the study. The only difference was that farmers in Nsipe preferred sole cropping for legumes but planted on double rows. Intercropping was practised for maize with pigeon pea. They mentioned planting of maize using the Sasakawa method as their top priority; growing of groundnut as a sole crop on double rows and lastly cultivation of soybean as a sole crop on double rows followed this. During the validation meeting, the female participants indicated that they preferred sole cropping for groundnut (as opposed to doubled-up) since harvesting groundnut (intercropped with pigeon pea) has proved to be onerous, as extra caution needs to be taken to avoid damaging the pigeon pea crop as you dig out the groundnut.

In Linthipe, the female participants explained that most female farmers had adopted growing of improved dwarf bean varieties on pure stands. Beans were ranked first because
the leaves are plucked for relish as early as January. In February they have fresh beans for relish and can sell some before harvesting dry beans in March. Proceeds from the sales of the dried beans and fresh beans are used to buy maize during the lean months of February and March. They described beans as “mpulumutsi” literally meaning “a saviour crop”. The farmers were appreciative of the new farming practices, such as the pure stand cultivation of beans, which they had learnt from Africa RISING through CIAT and that had enabled them to improve the crop yield per unit area.

The second most preferred crop in Linthipe was groundnut planted on double rows per ridge as opposed to the previous practice of planting a single line. The reasons given for a preference for groundnut production included: (i) Increased yield per unit area due to double row planting and use of good quality seed, (ii) groundnut can be used as a relish when cooked like beans and eaten with Nsima, (iii) use of groundnut flour as an additive to other foods such as vegetables and porridge, (iv) use of peanut butter and roasted nuts as a snack and relish, and (v) production of groundnut paste (called Thendo), where tomato and onions are added to groundnut flour to make a gravy.

Female participants also highlighted growing soybean on pure stands on double rows as another practice they have adopted. This practice has made them realize bumper yields. In addition, soybean has become an important crop, especially with the processing learned from Africa RISING. It can be used as porridge, turned into soymilk, or roasted and eaten. The surplus is sold for income.

Cowpea production was ranked fourth and described as an early maturing crop and source of food that could also be sold for income. Finally, participants stated that they had adopted maize production using the Sasakawa method of planting and applying recommended fertilizer. Here maize is intercropped with beans—practice farmers indicated they learnt from Africa RISING through CIAT.

During the validation meeting in Golomoti EPA, participants were asked to rank the practices that they have adopted in their order of priority. As seen in Table 5, maize and cowpea intercropping ranked first. This practice is not on the mother trials but has been adapted. The farmers explained cowpea improves soil fertility and is a relish for the household while maize is considered as “life”, i.e., one cannot do without it. The participants described this kind of intercropping is an innovation from the community as cowpea is planted almost 6 weeks after the maize has germinated or when the maize crop is at tasselling stage and 2–3 maize leaves at the base of the maize plant are removed to allow space for aeration.

Groundnut and cowpea were ranked second. Most of the female participants pointed out that groundnut is an important crop at household level due to its multiple uses. It is used as a relish; groundnut flour is mixed with maize flour to make a rich porridge; and groundnut flour is also added to other dishes like vegetables and some types of fish to improve the taste. Respondents also insisted that both groundnut and cowpea improve soil fertility such that when rotated with maize, the crop does well and you do not need to apply as much fertilizer.

Soybean and pigeon pea intercropping was ranked third. Female participants advanced similar reasons for adopting this practice as for the second ranked above. They indicated that the practice allows them to harvest two crops from the same area while at the same time soil fertility is improved. Soybean has a myriad of uses including making porridge, soy
cakes, and soymilk. Soybean is also sold, the proceeds of which are used to buy other household necessities.

Livestock production: With regard to livestock, female farmers under the Dzaonewekha milking bulking group in Linthipe EPA postulated that they had learned and adopted processing of diversified milk products such paneer, yoghurt and chambiko. They spoke highly of paneer, which is prepared like meat and eaten as a relish liked by many. As regards the goat farmers, the team interviewed two women who experimented with various feeding regimes for their goats. The experiments aimed at finding out the best feeding regime for fattening the goats. According to a graduate student from LUANAR working with the farmers, they had four treatments:
1. Grass and maize bran
2. Grass + maize bran + Gliricidia sepium
3. Grass + Maize bran + Faidherbia albida
4. Grass + Maize bran + Faidherbia albida + Gliricidia

Female participants ranked feeding goats with Gliricidia sepium as supplementary feed number one because the goats grew much healthier in their experience. Second was the use of Faidherbia albida as supplementary feed to grass and maize bran. Faidherbia albida is a locally and naturally growing species along Lake Malawi. The goats feed on pods that fall from the trees. The female participants indicated that LUANAR had brought 32 he-goats, which were given to the two female farmers for mother trials. It was expected that other community members learn from them. They formed a committee for easy management of the learning process and a drug box was set up to assist in disease control for the goats in the community. The 32 goats were divided into four groups to fit the four feeding regimes, translating into eight goats per treatment. It should be pointed out that in this set up there were no baby trials. The understanding was that after learning, interested farmers/babies would adopt or adapt the preferred practice/feeding regimes the following year.

Agricultural practices and technologies adopted/preferred by males

Table 3: Practices preferred by male farmers in order or preference.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Kandeu</th>
<th>Nsipe</th>
<th>Linthipe Dairy</th>
<th>Linthipe</th>
<th>Golomoti</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Groundnut and soy intercropping</td>
<td>Maize using Sasakawa and fertilizer, manure</td>
<td>Planting and use of Leucaena species</td>
<td>Soybean sole crop on double rows</td>
<td>Groundnuts and pigeon pea intercropping</td>
</tr>
<tr>
<td>2</td>
<td>Maize using Sasakawa and manure, fertilizer</td>
<td>Soybean on double rows</td>
<td>Knowledge of balanced diet for dairy and how to make it</td>
<td>Planting groundnuts on two rows</td>
<td>Maize using Sasakawa and fertilizer, manure with pigeon pea</td>
</tr>
<tr>
<td>3</td>
<td>Groundnut planted on double rows</td>
<td>Record keeping</td>
<td>Maize using Sasakawa method</td>
<td>Soy and pigeon pea</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cowpeas and pigeon pea – doubled up</td>
<td></td>
<td>Cowpea and pigeon pea</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Male participants from the four EPAs had varying preferences on the practices that had been introduced by Africa RISING as highlighted in Table 6. In Kandeu EPA, most of the male
participants indicated that they preferred groundnut and soybean intercropping (doubled-up). This was ranked first, followed by growing maize using the Sasakawa method of planting including the adjustment of ridges to a 75-cm distance between rows and the application of manure and fertilizer. In Nsipe EPA, maize cultivation using the Sasakawa method and application of manure and fertilizer came first, followed by soybean on double rows. Third was planting groundnut on double rows. According to the Nsipe male farmers, their major motivation for preferring and adopting these technologies/practices was that they lead to increased yield.

Figure 2. Illustrating the doubled-up groundnut and pigeon pea technique. Source: Africa RISING.

With regard to Linthipe EPA, during the validation meeting most of the male farmers stated that they had adopted soybean production with sole cropping and double row per ridge. They explained that they preferred soybean since they receive their first income from the crop as they sell soybean before other crops such as maize and groundnut. The second preference was growing groundnut on double rows. This practice results in higher yields on small areas as compared to the conventional practice. The third and last preferred practice was maize production using the Sasakawa method that enables farmers to realize higher yields.

Most male participants in Golomoti EPA highlighted four practices as being the most preferred and adopted. These included the following in their priority order established during the ranking exercise: (i) groundnut and pigeon pea intercropping known as doubled up, (ii) maize and pigeon pea, (iii) soybean and pigeon pea, and (iv) cowpea and pigeon pea. The male participants preferred groundnut and pigeon pea because it improves soil fertility. One participant stipulated: “My field has changed completely. On the plot where I have been growing AR practices on doubled up, the soil is getting darker and richer and everyone can
see. I want to use these practices on every corner of my field”. In addition, farmers further pointed out that groundnut stover are used as feed for animals. More importantly they explained that groundnut is now in high demand on the market, just like pigeon pea. Second ranked was maize and pigeon pea. Maize is an important food crop while pigeon pea (as stated earlier) is key for soil fertility improvement when the leaves fall and decompose. Soybean production with pigeon pea came third. The farmers stated that soybean has been adopted because it has multiple uses. While the first option is selling it for cash, they also keep some for household processing. Finally, cowpea and pigeon pea intercropping is also being preferred because both crops add fertility to the soil and can be sold for income after harvest. Respondents indicated that they had sprayers and were prepared to buy chemicals for spraying, as the crop tends to suffer from aphid attacks especially during dry spells.

From the male participants’ responses, it can be noted that two practices have been highly preferred or adopted across all four EPAs. These are (i) use of doubled-up practices such as groundnut with pigeon pea/cowpea or soybean with pigeon pea/cowpea, and (ii) the Sasakawa method of planting maize with the full rate of fertilizer and manure application. Adoption of the second practice (the Sasakawa method with full rate fertilizer and manure application with ridges spaced at 75 cm) is contingent upon the ability to acquire the necessary resources, especially inputs such as fertilizer, hybrid maize, and manure. Male participants indicated that they try as much as possible to acquire such, hence the adoption. Secondly, this technology requires a lot of labor, as one need to plant one seed per planting station spaced at 25 cm intervals as opposed to the usual practice of planting 3 seeds per station spaced at 90 cm intervals.

Pigeon pea and cowpea were said to require control against pests, so needed constant spraying to get a reasonable yield. Therefore, without access to a sprayer and chemicals for spraying one cannot grow the crop. Africa RISING staff confirmed that they do not provide chemicals for pest control, but recommend the use of Dimethoate, which farmers are expected to buy on their own. An Africa RISING technician indicated that farmers have devised local methods for pest control such as the use of Tephrosia especially in Linthipe EPA.

With regard to livestock production, male farmers from the Dzaonewekha milk-bulking group in Linthipe EPA, indicated that their most preferred practice or technology was planting and feeding Leucaena palida, as cows like this fodder. The second choice was the practice or knowledge of how to make a balanced diet/feed for a dairy cow. They felt this knowledge is vital, as it has contributed to increased milk yield. The third and final practice mentioned was record keeping. Some farmers indicated that they had received hardcovers from ICRAF for record keeping in regard to their dairy cows. This helped them to know for instance when the cow is likely to be on heat.

The Dzaonewekha milk-bulking group has worked with the World Agroforestry Center (ICRAF) in improving livestock feed. ICRAF staff mentioned that in 2014 they provided farmers with trees nurseries for Leucaena.
ICRAF indicated that trees are a long-term investment or fixed asset that may stay 10-15 years. This can become a limiting factor for the adoption of fodder trees. For instance, where a husband has settled at his wife’s parents, he may fear that if the marriage union breaks he will leave the trees behind. The Ntcheu DADO highlighted a similar observation:

“Most of the men under matrilineal settlement patterns are not eager to invest in long-term assets such as building a decent house, buying livestock like cattle and others, for fear that once the marriage fails or the wife dies they will leave the village. Marriages are very unstable in this district, divorce has become a common phenomenon, and the wife can easily chase the husband if they don’t want him. Hence husbands are reluctant to invest knowing they will lose most of what they worked for when the marriage fails.”

(KII DADO Ntcheu, 28/10/16)

Technologies not preferred/adopted by male and female farmers

Whilst many participants spoke highly about practices and technologies introduced by Africa RISING, they also mentioned other practices that they did not prefer. This varied depending on location or district and gender. For instance, in Kandeu and Nsipe EPAs in Ntcheu District, most female farmers indicated that they did not like growing pigeon pea and cowpea because they get easily attacked by diseases and the farmers are often unable to buy pesticides; neither do they have sprayers. It should be noted that spraying requires the ability to read and understand the instructions for mixing pesticides, which may constitute a challenge.

During the validation meeting some participants from Nsipe EPA, especially the females, indicated that in as much as they understood the benefits of intercropping pigeon pea and groundnut, they had challenges during harvest time.
However, most of the male farmers had a different opinion, indicating that this was not a big problem to them. When the consultancy team asked the AEDC for Nsipe about the female farmers’ complaint, she clarified that the problem arises when farmers plant the groundnut too close to the pigeon pea plants instead of leaving adequate space as instructed.

Most of the male participants in Nsipe EPA said that they did not like the pigeon pea variety that was given to them because of its late maturing characteristics. Participants in Dedza, Linthipe EPA, stated that it was difficult to grow pigeon pea because of the goats that are let free and end up eating the crops. For groundnut, almost all the male participants appeared not to like the groundnut variety that is promoted by African RISING known as Nsinjiro. They explained that it is good for making groundnut flour but has low demand on the market compared to CG7. They also alleged that Nsinjiro is small seeded and therefore difficult to shell although it is highly productive.

**Gender difference in adoption of practices/technologies**

A general pattern that emerged during the study across all the four study EPAs is that market-oriented technologies are highly adopted by men. These are technologies that produce high yields and relate to varieties that are preferred by the market. On the other hand, women seemed to adopt technologies related to varieties, which are good for domestic use. Food security was a critical factor for female farmers when it came to adoption of technologies and new agricultural practices.

Women also adopt technologies, which require less labor. For instance, while female participants appeared to be happy with practices in the baby trials because there was limited labor involved, it seemed challenging especially for FHHs to apply them on a larger scale. In Kandeu EPA, most of the female participants indicated that in as much as they liked the Sasakawa method of growing maize, including the need to adjust the ridges to 75 cm intervals, they found the task very demanding. Male participants in Kandeu EPA FGDs reinforced this observation. They explained that women, especially female heads that do not have grown up boys, have to wait for males to finish their fields before they can request them to adjust their ridges to 75 cm intervals. These women will elicit the support of male relatives or any other men in the community.

Information gathered from the meetings with the mother and baby farmer groups in Kandeu and Nsipe in Ntcheu and Linthipe and Golomoti in Dedza as well as the interviews with the female and male key informants show that women have a higher workload since they are not only engaged in reproductive work but also spend the same time as men doing productive work. Some female participants mentioned that Africa RISING research work had increased their workload two-fold because of several tasks that are brought by the project activities. It was learnt that women collect stover after harvesting and carry it to the house to make compost. Carrying the compost back to the fields and spreading it out on the whole field to strengthen soil fertility before planting results in more work. The planting of one

“One needs to take extreme caution when harvesting groundnut so that one doesn’t end up damaging the roots of the pigeon pea and this greatly delays the harvesting process albeit still ending up damaging some pigeon pea.”

(Nsipe, FGD validation, Female 09/12/2016)
seed per “phando” (planting station) also known as the Sasakawa method including the addition of manure and fertilizer all increases the amount of work. However, most of the participants in both male and female farmer FGDs reported that, despite the increase in workload, the harvests also increase two-fold, especially if there are good rains. Therefore, both male and female farmers participating in this research appreciated the increased yield from increased work. Figures 3, 4, and 5 show female participants’ perceptions with regard to an increase in labor and increase in yields due to new agricultural practices introduced by Africa RISING (Golomoti, Linthipe, and Nsipe EPAs).

Three practices stood out as being labor intensive. These are adjusting the ridges from 90 cm intervals to 75 cm, making of compost manure in order to supplement fertilizer application in the field, and planting of one seed per planting station spaced at 25 cm intervals in the case of maize (Sasakawa method). Out of these three, it was adjusting the ridges from 90 to 75 cm that was seen to be the most labor intense, especially for FHHs. As described earlier, some FHHs had to rely on their male relatives or male friends to assist with this activity. In terms of the division of labor, the increased workload in the field is often shared equally among household members. But for most female farmers spending more time in the field does not result in less domestic tasks. Household chores are waiting for them when they retire home from the field.

Figure 3: Difference in the amount of yields before and after Africa RISING, Amosi village, Nsipe EPA.

Figure 4: Increase in amount of work due to Africa RISING practices, Mbidzi village, Linthipe EPA.

Figure 5: Increase in amount of work due to Africa RISING practices, Golomoti, EPA.
An increase in yields means that households can harvest more in the short term. However, it cannot be said that the increase has sustainable impacts as the plots of land that are being cropped by the baby trial farmers are small and the best farmer efforts may be neutralized by adverse natural influences (such as droughts and inconsistent rainfall patterns due to climate change). If cultivation is extended to inferior land (often farmers’ bigger portions of land) without practicing the soil fertility enhancing practices introduced by Africa RISING, the returns per unit area are diminished. Nonetheless, it emerges from the findings that in spite of the labor intensiveness of some of the technologies being promoted by Africa RISING (such as the Sasakawa way of planting, i.e., one plant per station and adjusting ridges from 90 cm to 75 cm intervals), the increased yield per unit area plays a critical role in influencing farmers’ adoption of such technologies even for bigger fields.

With regard to the division of labor, the daily activity clock done in Nsipe EPA for both men and women groups showed that there is more work for women than men especially during the growing/rainy season. In addition to female farmers’ reproductive work, they also do almost the same amount of work as their male counterparts or husbands in the field. Most of the male participants during the FGD in Nsipe agreed that women are the busiest during the rainy season. They stated that women are busier than men although they claimed that some of the work that keeps women busy is easier.

“For the women do not have much time to rest especially during growing season. We wake up together early in the morning to go to the field. After returning they have to draw water, clean the surroundings, and prepare food for the family, while we are resting.”

(Nsipe FGD male, 27/10/16)

Female participants in Nsipe indicated that the time of waking up varies from one household to another.

“We wake up either 4.00am or 5.00am to go to the field. The actual time varies per household, but it’s usually between 4.00am and 5.00am for most of us. We do not do any work but go straight to the field. But when we return around 9.00am that is when we have to draw water from the borehole, sweep the surrounding, fetch for relish and start preparing lunch, there is no time for resting.”

(Nsipe FDG female, 27/10/16)

Another female participant added: “But for those of us with school going children the first activity when we wake up is to make fire, to boil water for the children to bathe, and make porridge for them; thereafter we go to the field.”
The explanation above from the female participants’ FGD in Nsipe is similar to what the male participants stated in their FGD. Table 7 provides a general picture of the activities undertaken by both male and female farmers during the rainy or growing season in Nsipe EPA.

**Table 7:** Daily activity clock for rainy season established during male FGD in Nsipe.

<table>
<thead>
<tr>
<th>Women/Time</th>
<th>Women/Activity</th>
<th>Men/Activity</th>
<th>Men/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.00am</td>
<td>Waking up</td>
<td>Waking up</td>
<td>5.00am</td>
</tr>
<tr>
<td>4.00am-5.00am</td>
<td>Make fire to boil water for children to bathe and make porridge</td>
<td>Field cultivation, for instance ridging, weeding, banking, fertilizing</td>
<td>5.00am-9.00 am</td>
</tr>
<tr>
<td>5.00am-9.00am</td>
<td>Field cultivation, for instance ridging, weeding, banking, fertilizing</td>
<td>Waiting for food and eating breakfast</td>
<td>9.00am-10.00am</td>
</tr>
<tr>
<td>9.00am-10.00am</td>
<td>Drawing water from the borehole, preparing and eating breakfast</td>
<td>Mostly resting and waiting for food</td>
<td>10.00am-12.00pm</td>
</tr>
<tr>
<td>10.00am-12.00pm</td>
<td>Looking for relish and preparing lunch for the family</td>
<td>Eating</td>
<td>12.00pm-12.30pm</td>
</tr>
<tr>
<td>12.00pm-1.00pm</td>
<td>Eating and cleaning</td>
<td>Continue resting</td>
<td>12.30pm-2.00pm</td>
</tr>
<tr>
<td>1.00pm-2.00pm</td>
<td>Resting</td>
<td>Return to the field either the baby trial field or the bigger field</td>
<td>2.00pm-5.00pm</td>
</tr>
<tr>
<td>2.00pm-5.00pm</td>
<td>Return to the field either the baby trial field or the bigger field</td>
<td>Feed the livestock, take a bath and eat</td>
<td>5.00pm-7.00pm</td>
</tr>
<tr>
<td>5.00pm-7.00pm</td>
<td>Fetch and boil bathing water for husband and herself, prepare supper and clean the utensils</td>
<td>Retire to bed</td>
<td>7.00pm-5.00am</td>
</tr>
<tr>
<td>7.00pm-4.00 am</td>
<td>Retire to bed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In Nsipe EPA, female participants explained that they were unable to adopt cowpea production because pests easily attack the crop. Therefore, it requires frequent spraying which they considered to be labor intensive apart from not having the sprayers. On the other hand, male participants in the same EPA still mentioned cowpea and pigeon pea intercropping as one of the practices they adopted and ranked it fourth. This shows that labor and access to inputs (in these case chemicals are factors that influence the adoption of new practices and technologies. In this case access was limited for women farmers.

In Linthipe EPA, male participants ranked soybean production as number one, since it is a trusted source of income due to the readily available market for the crop. On the other hand, female participants prioritized beans as number one. This is because of beans’ importance in two aspects: As an early maturing crop beans meet household food security
needs (such as a source of relish) and provide a source of income to buy maize during the lean periods of February and March. Men indicated, “It is tough to sell beans because you will surely quarrel with the wife”.

“You really can’t touch the beans or attempt to take them to the market as doing so will result into picking a quarrel with the wife. To avoid quarrelling we focus on soybean production as we can sell the harvest freely without being controlled.”

Linthipe, male participant, validation meeting, (22/12/16)

With regard to livestock, there were clear gender differences between female participants in the adoption of new practice and technologies. For instance, in the Dzaonewenkha milk-bulking group, female participants indicated that they had adopted processing of diversified milk products such as paneer, yoghurt, and chambiko (plain yoghurt). Lessons on processing different milk products were provided by a graduate student from LUANAR, whose research is funded by Africa RISING with the aim to improve the nutrition of children less than five years of age. In contrast, most male farmers reiterated during the validation meeting that they adopted use of *Leucaena palida* as livestock feed. They also appreciated the knowledge gained in preparation of a balanced diet for dairy cows and finally the record keeping. It is clear here that men were interested in learning technologies that improve the yield of the milk since this is the most important source of cash. Achieving more milk yield would result in increased income.

In Golomoti, male participants adopted the elevated goat kraal (*Khola*) that was introduced by the LUANAR graduate student. Obviously, the construction of such a kraal requires a lot of labor as it has compartments for feeding. The female farmers did not at all highlight this type of kraal as something they had learned, but appreciated the different feeding regimes and the rapid increase in body weight of the goats.

With regard to crop varieties, in Golomoti both male and female participants preferred the intercropping practices. However, according to the participants, female farmers preferred more intercropping with cowpea while male farmers preferred intercropping with pigeon pea. For instance, female participants had ranked maize and cowpea intercropping first, while groundnut and cowpea intercropping came second. In contrast, men ranked groundnut and pigeon pea first, while maize and pigeon pea came second. Female farmers preferred cowpea due to the relatively short time they take to mature. In addition, cowpea may be used for household consumption earlier than pigeon pea. It is important to note that female farmers in the other EPAs had problems adopting improved cowpea varieties, as spraying against pests is required. This was not the case in Golomoti since it is a cotton growing area and therefore farmers have experience of spraying and sprayers are easily accessible. Even young boys and women have learnt how to spray over time.

Male participants in some cases perceived adoption as being linked to gender issues. For instance, some men in the Dzaonewekha dairy group did not have much regard for women’s abilities to adopt technologies. When the consultancy team wanted to find out what differences there were in the speed and manner of men’s and women’s acceptance of Africa RISING’s new products, one of the male respondents said:
Some male participants further expressed that most of the women in the Dzaonewekha milk-bulking group do not take up technologies since they wait to see if the technology is worth their time. The tone in the all-male FGDs in Dzaonewekha had little regard for the position and conduct of women.

**Technologies adapted by farmers**

This section responds to research question three, which has the following guiding questions: **Have female farmers adapted certain Africa RISING practices to make them more suitable for their use? Why have they adapted them? Have male farmers adapted certain Africa RISING practices to make them more suitable for their use? Why have they adapted them?**

Based on the limited information provided by farmers this question cannot be answered in an in-depth manner. However, there are some observations that suggest that adaptation varies according to gender. This will be described in the subsequent paragraphs.

In Kandeu and Nsipe male participants did not like the sole pigeon pea treatment. They contended that whenever they grow pigeon pea, it has to be intercropped with maize. This was one of the adaptations that had been made in two EPAs.

In Linthipe EPA, female participants explained that when using the Sasakawa method of planting maize (which is one plant per station spaced at 25 cm intervals), they would plant beans next to the maize plant for every fourth planting station. This is due to the importance that female farmers attach to beans as described in the previous sections.

The female participants in Golomoti EPA explained an adaptation that entails lagged planting of cowpea in a maize field. They explained that this kind of intercropping is an innovation from the community. Cowpea is planted almost 6 weeks after the maize has germinated or when the maize is at tasseling stage and 2-3 leaves at the base of the maize plant are removed to allow space for aeration.

In Nsipe the male farmers opted to use CG7 or Chalimbana (large seed) variety of groundnut instead of the Nsinjiro variety. CG7 and Chalimbana are highly marketable compared to Nsinjiro despite the latter being a high yielding crop. They also indicated that Nsinjiro is difficult to shell due to its small-seeded nature, although women mostly do the shelling.

With regard to aphid and pest control for legumes particularly in bean and cowpea, both female and male participants in Linthipe indicated that they would also use *Tephrasias* for aphid control, which has proved to be an effective alternative in the absence of recommended pesticides. The AEDO for Linthipe section and the Africa RISING technician also confirmed this as a local innovation for pest control. Africa RISING does not provide

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"Men adopt new technologies quicker than women, actually women tend to be sluggish with adopting new practices for dairy animals such as planting of *Leucaena palida* and other tree fodder, and they get preoccupied with unimportant household chores"
chemicals for pest control, but merely provides advice on the type of pesticides recommended for pest and aphid control.

As Bantly (2006) cited in Hockett and Richardson (2016:3) suggests, the best on-farm experiments are adaptive in the sense that farmers do not simply replicate an idea or technique, but are able to combine new ideas creatively with local knowledge. Further research will therefore be important for the Africa RISING project.

Sources of information about agricultural practices and management

This section responds to research question four, which has the following guiding questions: In each community, what are the most important sources of information about agricultural practices and management? How do female farmers have access to agricultural information? How do male farmers have access to agricultural information? How can gender differences in access to information and participation be explained?

The team’s discussion with different farmers’ groups and key informants showed that there is no discrimination based on gender in the provision of agricultural information to both female and male farmers. However, it would appear that male farmers tend to have an upper hand in accessing agricultural information as compared to female farmers mostly due to the timing and method of delivery. For example, women have reproductive and productive roles that do not leave much time for them to attend formal trainings conducted by either government extension workers or other service providers. This came out clearly when we established daily activity clocks for women especially during the rainy season in Nsipe and Kandeu EPAs. On top of that, the DADO for Ntcheu District explained, women do not like to attend formal meetings even when they have time to do so.

“There are more women attending open meetings or open days such as field days, food fairs than men because there is more entertainment during open days and the set-up is informal. On the other hand, we see more men than women attending formal meeting especially trainings as women seem not to like the classroom set up.”

(KII with DADO Ntcheu, 28/10/16)

Many of the female participants in our sample were not literate. However, they seemed to appreciate the experiential learning approach inherent in the Africa RISING mother and baby trials including the provision of planting seed for the baby trial. The mother and baby trials are a key source of information on agriculture practices and management and were mentioned in all FDGs with men and women in all four EPAs.
Female participants in Kandeu claimed that through Africa RISING they had learnt new farming practices that are useful. They pointed out that another positive element in Africa RISING’s approach is that they work closely with the government extension worker who resides close to them. Therefore, he is able to visit them frequently to offer advice.

Africa RISING’s main dissemination channels include training, demonstration in mother baby trials, annual food fairs, and field days. The Innovation Platform in Ntcheu organizes food fairs and field days. These are attended by partners and stakeholders supported by Africa RISING. A reversal of typical gender roles is visible during the food fairs when men cook and demonstrate different recipes of various foods, however they do not cook at home.

In addition, Africa RISING organizes seeds for maize, groundnut, soybean, and common bean, cowpea, and pigeon pea, which is collected by groups who have volunteered to participate in mother and baby trials from the EPA Offices. Africa RISING technicians in collaboration with the area extension officers train the farmers on the mother’s fields in the presence of baby farmers. The baby farmers provide labor in the mother’s field in return for receiving seed and engaging in Africa RISING agricultural practices. Currently the mother-baby approach is used as a method of experiential learning where farmers work on a lead farmer field (mother) with supervision and direction from the Africa RISING in collaboration with extension services. Farmers take the experience and replicate it on their own (baby) plots.

During FGDs we were informed that the majority of baby farmers were women because they own the land, but in some instances the husband/men were hosting the baby trials. The mother farmers have larger pieces of land and get more seed from Africa RISING. In all the women FGDs it was mentioned that the amount of seed that Africa RISING provides to baby farmers is small and limits the amount of land that can be planted. Extension workers at the EPA offices compile the type of seed and quantity that is given to the farmers. Africa RISING buys and transports the seed to extension offices. Extension officers distribute seed to farmers according to the names that are registered as either mother farmers or baby farmers.

Responses given by male participants in Kandeu regarding their source of agricultural information were similar to that of their female counterparts (see Table 8) except for radio. Men indicated radio as another important source of information on agriculture in addition to Africa RISING and government extension workers. For women in Kandeu, radio did not feature at all as a source of agricultural information.

In contrast to this, female FGD participants in the other EPAs (Nsipe, Gomoloti, and Linthipe) mentioned radio as a source of information on agriculture practices and management, but it was not a key source and was usually mentioned last. For instance, in Nsipe the women
claimed that they are usually very busy such that they hardly find time to listen to the radio especially in the morning. “Sometimes we get agricultural information from the radio mostly from Zodiak and MBC radio stations, usually in the afternoon because in the morning we are usually busy with household activities”, one of them said. Some of the female participants claimed that they had challenges accessing the radio as their husbands keep it under their control. Other female participants indicated that they do not own a radio at all, but were able to listen to radio programs through their friends or relatives within the village.
<table>
<thead>
<tr>
<th>Kandeu</th>
<th>Nsipe</th>
<th>Linthipe</th>
<th>Golomoti</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women Group</strong></td>
<td><strong>Men Group</strong></td>
<td><strong>Women Group</strong></td>
<td><strong>Men Group</strong></td>
</tr>
<tr>
<td>Africa RISING</td>
<td>Africa RISING</td>
<td>Africa RISING</td>
<td>Africa RISING</td>
</tr>
<tr>
<td>Chief (traditional leader)</td>
<td>TV</td>
<td>CIAT</td>
<td>Total Land Care</td>
</tr>
<tr>
<td></td>
<td>Total Land Care</td>
<td>Concern Universal</td>
<td>Total Land Care</td>
</tr>
<tr>
<td></td>
<td>Hunger Project</td>
<td>ICRAF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neighbor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cellphone - 321</td>
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</tbody>
</table>

Male participants reported to attend agricultural trainings offered by government extension workers and NGOs. They also reported to receive mobile phone messages and to have access to radios where they listen to agricultural information. Travelling to markets enabled them to share knowledge with other farmers and learn from their peers. Some male participants in Golomoti and Nsipe EPAs use cell phones as a means for accessing agricultural information. One man who mentioned this source indicated that there is a platform known as 321. Using an Airtel line he dials in and chooses the type of information he needs. Information comes in the form of voice messages and the initial eight voice messages are free. Female participants did not mention cell phones as a source of agricultural information, although during our visit we saw some women using the devices. Other sources of information on agriculture practices and management mentioned by the farmers were NGOs (e.g., Concern Universal, Total Land Care, and Hunger Project) and the traditional leader. In the male FGD in Linthipe farmers mentioned CIAT and ICRAF as separate sources of agricultural information apart from Africa RISING.
Types of extension activities underway and perception by farmers of mother and baby trials versus extension demonstrations

This section responds to research question five, which has the following guiding questions: In each community, what are the types of extension activities underway, and local perceptions? How do female farmers perceive mother and baby trials of Africa RISING versus extension demonstrations? How do male farmers perceive mother and baby trials of Africa RISING versus extension demonstrations? How can gender differences in the perception of extension approaches be explained (mother and baby trial approach of Africa RISING and extension)?

Malawi government extension officers use the lead farmer approach. The lead farmers receive training and technical assistance from the extension officers on their demonstration plots. Key practices include (i) soil and water conservation using mindanda (green belt), (ii) weed control, (iii) crop nutrition, and (iv) better postharvest handling techniques. In turn, the lead farmers provide training to other farmers around their demonstration plots. Existing state-run extension services are often poorly resourced such that key messages do not filter down to the rural smallholder farmers who need them most. Without a basic understanding of good agricultural practices, most women who make up the majority of smallholder farmers in Ntcheu and Dedza cannot grow sufficient crops to move past subsistence farming. Africa RISING is collaborating with this depleted extension capacity. This has implications for the quality of services and tracking of adoption and adaption of the research products.

Government extension services include the sharing of knowledge and ideas between farmers and extension officers, which has enabled farmers and extension officers to cooperate as equals in Central Malawi as elsewhere in the country. The Malawi Government extension uses the household approach where for all activities and trainings several household members are involved (husband, wife, male and female youth in MHHs and female head and male and female youth in FHHs). This is due to the fact that extension groups have integrated HIV/AIDS education in all their programs and gender must be visible. Certain extension communication activities such as home visits, personal letters, telephone calls, and informal contacts are rarely used because of the lack of resources.

The mother-baby approach that Africa RISING is using and the government extension demonstration method are similar in a few aspects: the same government extension officers supervise mother-baby trials and demonstration plots. Lead farmers are selected in collaboration with extension officers based on previous performance and proven leadership skills and the ability to teach other farmers using their own land. However, there are also key differences between mother and baby trials on the one hand and the government extension demonstration approach on the other. These are: First, under Africa RISING’S mother and baby trial approach farmers are supplied with seeds for the experimentation activities. Second, other than on the demonstration plots baby trial farmers or followers work physically on the mother plots that have specific treatments and a research protocol that is used for data collection purposes. Third, in the same season the baby trial farmers implement a minimum of four technologies/practices they have observed on the mother field.
Almost all male participants from Linthipe expressed satisfaction with the mother and baby trial approach compared to extension demonstration especially as far as learning by the baby farmers is concerned. 

“At the mother trial, there are more technologies and crops that are demonstrated compared to the government extension demonstration, where they have just 1 or 2 crops and the owner of the demonstration plot does all the work alone. But on the mother trial we all work together as group to do ridging, planting, weeding, fertilizer application, and harvesting and this helps us to learn and replicate the same in our baby trials”

(Linthipe male participant, FGD, 02/11/16)

In general, women seemed happy to work and learn from the mother trials. However, the centrality of individuals (mother farmers) in this dissemination approach raised questions regarding their selection as mother farmers, a bias in the passing on of information to and from farmers, power distribution, and gender dynamics within the research group. Women who participated in the FGDs of this study stated that there were community elements that discouraged them from providing their labor on the mother plots. They saw their labor as further enriching the mother farmers who already have larger pieces of land and get more seed than the baby farmers for the experiments every year. As a result of free labor and seeds, mother farmers harvest more than the baby farmers. Respondents raised questions regarding the creation of more inequality and an increase in the wealth gap in the community through the research activities.

Seed shortage was mentioned in almost all the women FGDs as a major challenge. Women farmers said it was difficult to maintain seed stocks particularly in the previous season (2015/16) because of the drought.

Since 2015 Africa RISING has supported INVC (Integrating Nutrition in Value Chains) Malawi in training farmers and extension to promote local seed production. Working with the Malawi government (since 2016), it initiated expanded farmer training in production of quality declared seed.

Types of extension activities underway in each community
Apart from Africa RISING and government extension services, all groups highlighted other extension activities currently under way in their respective communities. For instance, in Nsipe EPA both women and men in their FGDs mentioned that the following organizations are providing different kinds of extension services to them: the Hunger Project, the National Smallholder Farmers Association of Malawi (NASFAM), Total Land Care, Japanese Tobacco International (JTI), and the Micro Loan Foundation.

The Hunger Project provides fertilizer to some farmers in the Nsipe community on loan; the beneficiary farmers are organized into clubs. Some of the farmers participating in the mother and baby trials are also beneficiaries of this fertilizer. They indicated that they apply fertilizer with some of the practices learnt from Africa RISING (such as the Sasakawa way of planting) and this helps them achieve higher yields. The loan is repaid with the maize harvest. Farmers and the project agree on the amount of maize to be given as repayment for the fertilizer. The maize is then kept in the community grain bank and later sold to farmers
during the lean period. The AEDC for Nsipe EPA confirmed that different organizations’ activities do complement each other:

“...access to fertilizer is there through NGOs like Hunger Project. We also have NASFAM who give loans for soybean and groundnut seed and farmers give back double the amount they have received, i.e., if you take one kg you give back two kg of seed. (...) They get a loan through their clubs”.

(KII AEDC Nsipe EPA, 27/10/16)

Total Land Care (TLC) is also working with farmers in Nsipe and Kandeu providing extension services on conservation agriculture, agroforestry, and afforestation. TLC organizes farmers into groups that establish nurseries for trees. The participating farmers plant *Faidherbia albida* locally known as *Msangu*, *Leucaena*, *Acacia*, and *Mbawa* (African mahogany).

Both male and female participants in FGDs in Nsipe and Kandeu mentioned Japanese Tobacco International – a global tobacco company. It provides groundnut and soybean seed to farmers that have registered to grow barley tobacco. These farmers receive fertilizer and legume seed on credit. The money is recovered during the sales when all the tobacco is sold through the auction floors. The company has its extension staff that move around to register the farmers that are interested and provide advice on tobacco production.

During the validation meeting, female participants in Nsipe indicated that the National Smallholder Farmers Association of Malawi (NASFAM) is also working with some of the farmers in Kandeu EPA. “NASFAM works through clubs and provides credit for the cultivation of soybean and groundnut. And they come later to buy back and they work in collaboration with government staff.” (Nsipe, FGD female, 27/10/16).

In Kandeu male and female respondents stated during the validation meeting that there is a microfinance institution called the Micro-Loan Foundation that is also working with some farmers in the community. The Foundation provides fertilizer loans to interested farmers who repay with a commercial interest rate. However, the AEDC for Kandeu EPA expressed ignorance of their presence, stating that they had not yet paid an official courtesy call to his office. Nevertheless, he had heard from some farmers that the micro finance company was working with them. He acknowledged the presence of NASFAM and JTI in the EPA and that he was fully aware of their extension activities.

In Linthipe EPA, male and female FGD participants mentioned CIAT and Concern Universal as institutions that are working in the area providing research and extension services. They explained that CIAT had been experimenting with some farmer groups and individuals on various types of bean varieties especially the dwarf varieties. Concern Universal provides relief services during times of hunger (like in 2016, the year of the study), but has also been distributing seeds of various crops including bean and soybean to selected farmers in the community.
Farmers under the Dazonewekha milk-bulking group indicated that they receive messages on dairy production from a number of institutions apart from ICRAF.

“CABMACC can be considered at the second most important organization in our community after ICRAF because they come very often to teach us how to manage the fodder trees. ICRAF comes once in a while but we consider them useful because of the fodder trees that they brought and helped use to establish in our homes.”

(Linthipe, Dzaonewekha dairy, male participant FGD 01/11/16)

Capacity Building for Managing Climate Change in Malawi (CABMACC) is a research project under LUANAR that supported the farmers group in establishing *Centrosema* as legume feed for their dairy animals. The other organization mentioned by farmers was the Central Regional Milk Producers Association (CREMPA), which works with dairy farmers in the management of the milk cold chain and selling to buyers.
Conclusions and recommendations

Conclusions: A synopsis of the gender analysis

As stated in the introductory section of this report, the gender analysis of this consultancy is based on the social relations framework developed by Naila Kabeer (1994). This framework adopts concepts rather than tools to analyze relations between people and people, people with resources and people and various activities. It explores ways of restructuring these relationships through the social systems that dominate households, the state, market, and community. Specifically, the framework is based on the idea that gender (as a concept of development) aims at improving human well-being, which consists of survival, security, and autonomy. As such, gender relations are not confined within household interactions, but are also prominent within institutions such as the market, the state, and the community that are critical in promoting or hindering human well-being. Thus, Kabeer argues that institutions ensure the production, reinforcement, and reproduction of social relations, and, thereby, social difference and inequality. Thus, according to Kabeer, gender analysis entails looking at how institutions create and reproduce inequalities.

The findings generated from employing the aforementioned conceptual approach are essential in informing research and discussions in Africa RISING’s second phase. This section therefore presents conclusions and recommendations based on the findings. The presentation of the conclusions is in line with the five main evaluation questions set out in the TORs of this assignment.

Dynamics related to criteria used by male and female farmers in evaluating suitability or adoption of preferred AR technologies

As presented in the findings section, evaluation questions one and two surrounded generating insights regarding criteria used by male and female farmers in evaluating suitability and adoption of Africa RISING technologies. This included seeking an understanding of how intra-household decision-making processes; labor allocation; access to resources (such as land, inputs, etc.) as well as rules and norms governing household and community-based livelihoods, influence evaluation of suitability and adoption of Africa RISING technologies being promoted in the study sites.

As Kabeer asserts, seeking an in-depth understanding of how particular institutions work on the basis of their rules, practices, people, interactions, distribution of resources as well as authority and power dynamics, helps one to gain insights on who does what, who gains or who loses, amongst other things (Kabeer 1994). In line with Kabeers’ assertions, our findings firstly suggest that the set criteria for selection of suitability and adoption of crops and learning of agronomic practices for male and female farmers in all the EPAs in the study (i.e., Kandeu and Nsipe EPAs in Ntcheu and Golomoti and Linthipe EPAs in Dedza district) are related to women’s reproductive roles and roles ascribed to men as providers of finances to the family. Specifically, the female farmers who took part in the FGDs considered the following criteria as the basis for selecting and adopting their preferred knowledge products or technologies:

- Food security especially in terms of relish,
- High yielding varieties
- Early maturing crops
- Marketability of the crop
- Multiple usage of the crop
- Ease of management of crop, i.e., not requiring spraying or much labor and
- Easy to cook.

The above criteria suggest a link between women’s expected role of caring for the household members through cooking and making sure that everyone is fed, as ascribed by the sociocultural rules and norms of the study sites. As pointed out by several female farmers at the FGDs, ultimately it is women who are faced with the realities of hunger and are forced to deal with it: “When the children are hungry, they always ask the mother, not the father, it is the women’s responsibility to feed the family”. Even male respondents echoed these sentiments: “...whilst looking at the woman with hungry faces... will ask her for food”. These findings underline that norms, power relations, and social hierarchies influence interactions of both men and women at household and community levels.

On the other hand, one criterion that was mentioned as the first priority by male farmers in our study sites for selecting and adopting Africa RISING technologies had to do with crops or technologies that would enable them to fetch more money at the market. This would not only enable the men to fulfill their role as family providers, but also enable them to acquire other tangible assets and goods of their choice. As such, key criteria often mentioned by the male respondents included: (i) marketability of the crop, (ii) yield of the crop (iii) food security, and (iv) availability of land, as elaborated comprehensively within the findings section.

These key finding confirm Kabeer’s assertions that specified rules and norms (in this case gendered rules) ensure that there is a routine pattern of practice for carrying out tasks (Kabeer 1994). Consequently, certain tasks or practices get attached to a specific social group and influence what sort of decisions or practices they are likely to perform or are inclined to do (March et al. 1999). Thus, the criteria used by male and female farmers to adopt or select crops or technologies of their preference have an implication for Africa RISING’s promotion of knowledge products. Being aware of gendered preferences for crops or technologies, Africa RISING might be in a position to either cement or change the unequal distribution of household tasks that is rooted within the community’s rules and norms. A gender-responsive approach may ensure equitable benefits for male and female farmers.

Related to the above discussion, the team further observed that power relations and social hierarchies create further challenges for household decision-making processes. For instance, female farmers in MHHs often mentioned that in spite of their land ownership, they lacked the power and capacity to control the benefits accrued from the harvests. Discussions revealed that most tangible household assets belonged to men. With regard to selling their products in bulk, both male and female farmers mentioned that men were in control of making such decisions even though they might discuss their selling plans with their spouses. In some cases, both male and female respondents further spoke of how one partner might steal some of the other partner’s grain to sell for a little cash. This is because of the inability to openly discuss the utilization of harvests between male and female spouses. Furthermore, although most women (60.4%) in our study owned land, they were not able to make completely autonomous decisions with regards to the selection of their preferred crops or agronomic practices. This observation was more pronounced for female farmers living in MHHs who indicated that they had to consult with their husbands regarding any farming or marketing decisions. Comparatively, female farmers in female-headed household (20.9%) were found to be better off in terms of autonomy in decision-making such as which crops or technology to adopt and what or when to sell their crops. However, these farmers were at the same time disadvantaged when it came to choosing labor-intensive technologies.
Community and institutional aspects of male and female farmers’ adoption and adaptation of AR technologies

Evaluation questions two and three of the TOR sought to understand why female and male farmers adopted and adapted certain Africa RISING practices to make them more suitable for their use. Though these questions have been partly addressed through the above discussion on household dynamics, this section makes a further analysis on the community and broader institutional aspects that affect the same. As March et al. (1999:104) citing Kabeer state: “The underlying causes of gender inequality are not confined to the household and family but are reproduced across a range of institutions, including the community, the state and the market place”. In our study, these institutions were not only found to be interlinked, but also played a key role in influencing male and female farmer’s adoption as well as adaption of Africa RISING practices.

- **Community**

Perceptions of both female and male farmers in the FGDs were that the prime means by which they could ensure food security or accumulation of assets was through increased yields. These would be obtainable with the adoption or adaptation of new agricultural practices beyond the mother/baby trials. Respondents mentioned that they would continue to increase the potential cropping through doubled-up legumes, an increase in the number of ridges and plant population per hectare, and to use integrated soil fertility management. This requires additional labor. For instance, the Sasakawa method of planting and using fertilizer as well as manure to increase crop production was one of the most preferred or adopted practices introduced by Africa RISING. Almost all households in the study reported that through the Sasakawa practice they had increased the plant population. However, due to the labor intensiveness of the practice, MHHs in all four EPAs were better placed to adopt such a practice than FHHs most of whom had labor constraints. FHHs had to rely on male relatives and male friends or hire labor to help in adjusting the ridges. This implies that, without social capital, female farmers in FHHs would find it hard to adopt or adapt any labor-intensive practice being promoted by Africa RISING.

Furthermore, gender and power relations within the community can be an opportunity or a liability for Africa RISING. For instance, the mother/baby trials have become a community activity that takes place in the context of unequal social hierarchies. Specifically, in this study, some female respondents involved in Africa RISING mother/baby trials in Kandeu, Nsipe, and Mbizidzi spoke of being mocked by their neighbors for working on the mother field—giving their labor for free and making the already wealthy mother richer. This implies that Africa RISING’s criteria for the selection of mother farmers did not foresee the negative results that are being highlighted by these respondents. Thus, a holistic understanding of both positive and negative implications of Africa RISING promoted technologies and approaches is essential in order to map out which of those should be scaled up and which ones should be abandoned to avoid further polarization of the communities they are working with.

- **Markets**

Female farmers from MHHs and FHHs of this study reported to engage with markets beyond selling their produce at farm gates. Women who lived far away from markets preferred selling at the farm gate compared to those who lived close by markets. Men, more than women, sold their produce through markets. In addition, as earlier indicated, both male and female farmers in this study mentioned crops that would fetch good market prices as preferred crops introduced by Africa RISING. Thus, the market was identified as an important aspect influencing adoption and adaption of technologies or practices within the
four farming communities investigated. However, data revealed market challenges such as long distances; vendors that use false measurements; a lack of education and knowledge of how to start-up small enterprises; limited access to productive inputs; and lesser skill endowments. These challenges severely limit some segments of our study communities, especially female farmers, from having equitable benefits from market operations. Some of the male participants in the Nsipe FGD indicated that they would not allow their spouses to go to the Nsipe trading center along the M1 road to sell produce since the traders tend to buy at lower prices from women farmers and cheat them when reading the scale.

- **Government**

As indicated in the literature review, women dominate the agricultural sector where 97% of rural women are engaged in subsistence farming, while men dominate in cash crop production, services, operation, laboratory, and administrative occupations (Ngwira et al. 2003). Government, NGOs and Research for Development need systematic strategies for community engagement and an in-depth understanding of the social dynamics. For instance, the government of Malawi has enacted policies that demand the inclusion of women in all sectors and particularly agriculture. The DAES has adopted the Household Approach for all extension services. This approach demands that extension staff must work with all household members thereby ensuring equal participation. Household members are encouraged to develop a household vision, assess their current social and economic situation, take part in joint livelihood planning, and share the benefits that arise from working towards shared goals. Therefore, the approach helps the household members to work together to improve relations and decision-making and to achieve more equitable workloads (Bishop-Sambrook 2014). This approach follows Kabeer’s (1994) line of thinking whereby interventions in one sphere of social relations such as the policy or program implementation levels, might have significant effects on household level and vice versa. As such, the household approach would also be beneficial if applied to Africa RISING strategies since it will strengthen collective and gender-sensitive household decision-making processes.

**Recommendations**

From our study findings and the above conclusions, the team makes the following recommendations:

- Africa RISING needs to have a gender guidance framework that clearly outlines the desired change the research intends to see at household and community level particularly with regard to the position and condition of women for them to achieve practical and strategic positive change for women in its objectives and where gender-specific indicators are embedded.

- Most of the extension staff interviewed for this study had adequate training on gender awareness in agriculture. However, in situ training for all actors (AR technicians and extension staff, CGIAR scientists that collaborate with AR) to integrate gender into AR research activities is required in order to ably integrate gender planning into the research activities.

- A community development consultant specializing in gender issues should be attached to the research project to build the capacity of farmers, extension, and scientists on processes of engaging men and women in technology adoption intensification and market dynamics.

- There is a need for more gender analysis based on existing databases and ongoing research. Gender analysis should consider:
  i. Gendered division of labor within the household.
ii. Women and men’s access and control of assets and resources.
iii. Gendered allocation of benefits from participation in the intensification of various crops.

- Further research should establish adoption and adaptation of the various knowledge products/technologies introduced under the mother and baby approach beyond the trials to other bigger fields of farmers to better understand which practices are being preferred most.
- Africa RISING should consider partnering with government as well as other stakeholders within its study sites and add a component of edutainment for households (such as drama promoting specific technologies) in order to communicate research products in a simpler way to farmers as well as avoiding the contradictory extension information that might impede farmers from having maximum benefits from Sustainable Agricultural Intensification (SAI) initiatives.
- Africa RISING should take a household approach to its gender programming. This would encourage households/community members (both participating and not participating in Africa RISING trials) to have common goals in improved livelihoods through practicing Sustainable Agricultural Intensification (SAI) activities.
- There is a need to identify and promote both men and women as gender change champions among the mother farmers in the mother/baby trials in the communities carrying out research. Currently most mother farmers are women.
- Africa RISING should maintain its efforts to train farmers to multiply their own seed for increased production and reduced dependency in the long term.
References


Annexes

Data collection tools

Checklist for key informant interviews

District and local extension worker—AEDO and AEDC

1. Name of local extension officer  
2. Sex of extension work  
3. Location: district EPA section  
4. For how long have you been working in this community?  
5. Have you received any training in gender?  
6. If yes, who provided the training to you?  
7. When did you start working with Africa RISING project?  
8. What is your role in Africa RISING project?  
9. Is there any difference between demonstration extension approaches to that promoted by Africa RISING? If yes, what are the key differences?  
10. What extension services or activities are you promoting in this community?  
11. How do you think women and male farmers perceive the approach you are using?  
12. Is there any difference in how male and female farmers relate to you?  
13. How often do you meet/interact with these farmers?  
14. Are there any differences in terms of frequency of interaction with you between male and female farmers?  
15. If yes, please explain?  
16. Have you ever received any request from female farmer for extension support?  
17. If yes, what kind of support or information were they looking for?  
18. In your view, what are the most important sources of information on agriculture practice for women farmers in this community? Rank according to level of importance  
19. What is the most important source of agricultural information for male farmers? Rank according to importance  
20. What technologies/practices is Africa RISING project implementing/promoting in this area?  
21. In your opinion is there any difference between men and women in the way they evaluate the agricultural practices implemented by the project?  
22. Which criteria do women in female-headed households, use when evaluating agriculture practices knowledge for suitability?  
23. Which criteria do women in male headed households, use when evaluating agriculture practices knowledge for suitability?  
24. In your interaction with them, why do you think they use such criteria?  
25. Which criteria/factors do men consider in evaluating agriculture practices/knowledge products to adopt?  
26. How do you explain the gender differences in the evaluation criteria?  
27. Among the practices promoted by Africa RISING which ones have been adopted by male farmers and why?  
28. Which ones have been adopted by female farmers and why?  
29. What are the main challenges/faces impending adoption Africa RISING innovations/practices?  
30. What are some of the best solutions you can propose to overcome such challenges?
Traditional Leaders

1. Name of Traditional leader
2. Name of community
3. Sex of traditional leader
4. Age
5. For how long have you been a leader in this community?
6. What percentage of farming households are headed by women?
7. In what percentage of these is there an absent (emigrant) husband?
8. What field tasks are traditionally performed by women, and which by men?
9. Which processing and support service tasks are normally performed by women, and which by men?
10. What factors determine tasks defined as women’s work or men’s work?
11. What is the pattern of land ownership on family farms?
12. To what extent do women own or co-own land or have the right to use land?
13. How are decisions made about what to plant on which fields, and by whom?
14. How are decisions made about what livestock to rear or sale?
15. Who controls the earnings from cash crops or livestock?
16. How are they distributed within the household?
17. How are earnings allocated and spent?
18. How are men’s earnings from agricultural production spent?
19. How are women’s earnings from agricultural production spent?
20. What are the main crops grown in your community?
21. What is your role as a leader in the Africa RISING activities?
22. How do you think farmers perceive the extension approach being used?
23. Who decides whether to introduce new practices/purchase/use inputs?
24. Apart from Africa RISING, how do men/women get to learn about new agricultural practices?
25. Do you think there are differences in how much knowledge female and male farmers acquire? Why?
26. What changes have been made by female and male farmers since contact with Africa RISING?
27. Do you think there are differences in the speed and manner of accepting technologies between female and males? Why?
28. Which crops have replaced traditional staple crops of this area?
29. Whose roles have been affected by this staple replacing crop?
30. Do you think there are gender differences in the alterations made on new practices to suit farmers’ needs? Why?
31. What additional resources are required by women and men to sustain new practices (e.g., fertilizers, credit, chemicals, improved seeds etc.)?
32. Who among women and men have access to these resources
33. What is the impact of new practices on women’s time?
34. What is the impact of new practices on women’s ability to make decisions independent of male relations?
35. How do women and men share the benefits gained from the introduction of new products?
Key Informant Researcher Gender Study Data Gathering Guide

Name: M/F
Organization
Position in organization
Formal partner/ Informal partner to AR Malawi
For how long have you worked with AR in developing the knowledge products?

Objectives
To get data on gender considerations regarding approaches used for knowledge products advanced by Africa Rising since its inception.
To learn from scientists (researchers) of their observations regarding gender dynamics at household level during development and implementation of knowledge products activities.

Questions on Knowledge Product and Approaches
1. What crop knowledge products have you introduced in Africa RISING in Malawi?
2. How did you choose the product to introduce?
3. Describe the approaches that you have used in specific development of the knowledge products/ trials with farmers? (Entry points)
4. Who are the key collaborators in the knowledge production introduction?
5. What is the difference between mother-baby approach and the government extension demonstration methods?
6. How does women’s knowledge differ from men’s knowledge for the crops and livestock knowledge products as well as management practices?
7. What gender considerations did you take in introducing the product?
8. What knowledge products did women prefer?
9. Why did women prefer that knowledge product?
10. What knowledge products did men prefer?
11. Why did men prefer that knowledge product?
12. Was there any difference with regards to adoption of products between men and women in different types of households? (E.g. single headed; male headed etc.)
13. What are the market channels for the maize and legume crops and livestock?
   - What role do women play in the marketing of crops or livestock?
   - What role do men play in the marketing of crops or livestock?
14. Are there any gender changes that have occurred at household level as a result of introduction of new AR products?

Questions on intra/inter household gender dynamics at farmer level
15. What observations did you make of intra household decisions engaging with the trials on (intra household dynamics)?
   - Ownership and sizes of land selected for the crop trials?
   - Labor required for the crop/livestock knowledge product trials?
   - On women access to agricultural inputs?
   - On men access to agricultural inputs?
   - On women access to agriculture extension services?
   - On men access to agricultural extension services?
   - On women access to agricultural knowledge and information?
   - On men access to agricultural knowledge and information?
   - Income distribution in different types of households?
16. What gender factors would you consider if you were to introduce AR products within new settings?

**FGD Demographic Questions**

1. Date and district, Village and number of persons in the discussion (not more than 15)
   (Attendance register)
   Name of responded
   Mobile telephone number if applicable
2. Age of those participant
   - 18-30 = 1
   - 31-40 = 2
   - 41-50 = 3
   - 51-60 = 4
   - 61-70 = 5

3. Typologies of women farmers
   - Married = 1
   - Single = 2
   - Widowed = 3
   - Divorced = 4
   - Cohabiting = 5
   - Others = 6

4. Type of marriage (1) monogamy (2) polygamy?
5. If polygamist, how many wives?
6. Household size (number of people in the household)
7. How old are the household members?
8. Occupation (main occupation and others)
9. What kind of marriage pattern are they following (matriarchal, patrilineal)?
10. What religion?
11. Categorization of women farmers
   - Lead farmer who has offered land for mother baby trials = 1
   - Core Farmer practicing mother baby technology farming = 2
   - Farmer who is practicing doubled up = 3

12. What is the average size for land holding used for crop cultivation?
13. Who owns the land that you cultivate crops?
14. What is the size of the land you have used for mother baby trials?
15. Has the land been inherited?
16. If yes from whom has it been inherited?
17. Has the land you cultivate crops been bought?
18. If yes from whom and how much did you pay?
19. Has the land you cultivate crops been loaned to you?
20. If yes by who and how much do you pay for it per season?
21. Has the land been seized from other people?
22. If yes from whom and how and by whom?
Focus Group Discussion Guide

Consent Process

Consent from focus group participants should be requested in advance.

Thank you for agreeing to participate. We are to hear your valuable opinion on the points we will raise for discussion. The information you give us is completely confidential, and we will not associate your name with anything you say in the focus group.

- We would like to tape the focus groups so that we can make sure to capture the thoughts, opinions, and ideas we hear from the group. No names will be attached to the focus groups and the tapes will be destroyed as soon as they are transcribed.
- We understand how important it is that this information is kept private and confidential. We will ask farmers to respect each other’s confidentiality.
- The purpose of this study is to learn about differences that exist between women and men on how they evaluate and appreciate knowledge products advanced by AR Malawi. This is to strengthening gender in the program.

Introduction

- Introduce ourselves and explanation of the process. Agree on amount of time the discussions will take at least 2 hours per group. (at least 3 groups per village in one day)
- Ask the group if there are any questions before we get started, and address those questions.
- Discussion begins, make sure to give people time to think before engaging with the questions and don’t move too quickly. Use the probes to make sure that all issues are addressed, but move on when you feel you are starting to hear repetitive information.

Africa RISING household gender dynamics questions

1. Is there a difference between men and women in land ownership issues in 5, 6, 7, 8, 9?
2. Which crops do women grow?
3. What crops do men grow?
4. What AR knowledge crop products have been introduced?
5. What benefits have women accrued from use of AR knowledge products?
6. What livestock do men own?
7. What livestock do women own?
8. What AR knowledge livestock improvement product has been introduced by AR?

What are your main duties in the crop cultivation introduced by AR? (Accompanied, daily activity chart youths, men and women separately)
What are your main duties in livestock improvement AR knowledge products? (accompanied, daily activity chart youths, men and women separately)

9. What criteria do women apply when deciding to try AR new crops?
10. What criteria do men apply when adopting AR agricultural practices?
11. Are there differences between women and men choices in adoption of AR new agricultural practices?
12. If yes what are the differences,
13. How can they be explained?
14. What differences are there in the speed and manner of men’s acceptance of AR new products as against women?
15. How can these differences be explained?
16. What women roles have changed because of adopting Africa Rising products? (Pictures)
17. What roles have changed for men because of Africa RISING innovative knowledge products? (Pictures)
18. What alterations have you made to knowledge products/innovations that you have adopted to suit your needs? (Use of pictures and matrices)
19. Why was it necessary to make alterations?
20. What is the impact of new practices on your time (women and men) time? (Pictures and special Chichewa Expressions)
21. Rank your most preferred agricultural activity/innovation introduced by AR. (Matrices Pictures Statements)

**Types of extension activities underway, and local perceptions**
22. Are there differences between women and men access to agricultural inputs
   If yes explain?
23. What types of extension activities are current in this village?
24. How do you compare the extension demonstration practice to AR Malawi mother and baby practice? Ask (Chichewa name for mother/baby trials)
25. How do women farmers perceive mother and baby?
26. How do women farmers perceive mother and baby trials?
27. How do men farmers perceive mother and baby trials?
28. How can the differences (if any) in perceptions be explained?

**Differences between women and men in access to agricultural knowledge and information**
29. What are the most important sources of information about agricultural practices and management?
30. Are there any differences between men and women in accessing this information?
31. What are the key challenges that women face in accessing the desired information?
32. What are the challenges that men face in accessing information?
33. Why do these challenges exist?
34. What can be done to reduce these challenges?
35. Are there traditional methods of agricultural practices done by men and women?
36. Can these be used to strengthen AR research knowledge products?
37. What are the marketing channels for crops?
   Farm gate marketing fresh produce = 1
   Fresh produce market = 2
   Others = 3
38. What challenges do women face in accessing markets?
39. Who decides on how the money earned from cropping is distributed?
40. Are there underlying gender factors in the differences between women and men
41. ought to be considered if AR products (e.g. mother baby trials, doubled up legumes etc.) were to be introduced in new districts in Malawi?

That concludes our focus group.
Thank you so much for coming and sharing your thoughts and opinions with us.

**Materials and supplies for focus groups**
- Flip Charts and markers Pads and Pencils.
- Focus Group Discussion Guide for Facilitator
- One recording device
- Batteries for recording device
- Permanent marker for marking tapes with FGD name, facility, and date
- Notebook for note-taking
- Refreshments