

Gender Matters in Farm Power

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EXECUTIVE SUMMARY

This study explores how gender matters in small-scale farm power mechanization in African agriculture, particularly in maize-based systems. It investigates how intra-household gender dynamics affect women's articulation of demand for and adoption of mechanization in Ethiopia and Kenya. The study offers a conceptual approach to grasp these gender dynamics, a gender analysis methodology, and a set of recommendations. The central research question is: *How do intra-household gender dynamics affect women's articulation of demand for and adoption of mechanization?*

This study is funded by the Competitive Grant Initiative of the CRP MAIZE (CGIAR research program on maize-based farming systems). It contributes to advancing the MAIZE Gender Strategy, particularly the consolidation of the maize gender knowledge base and the initiation of strategic gender research related to known gaps. This study is linked to the FACASI project (Farm Power and Conservation Agriculture for Sustainable Intensification) that focuses on the introduction of specific small-scale mechanization technologies, i.e. two-wheel tractors (2WTs), with specific attention to the development of such technology and of business models.

Analytical framework

The approach of the study is based on a literature review on gender and technology adoption, with a focus on sub-Saharan Africa. The existing body of literature calls for a recognition that gender gaps in agriculture and women's constraints are of a systemic and institutional nature, and calls for explicit engagement with gender relations and dynamics. The study approach is based on the acknowledgement that the relationship between women's labour drudgery and demand for mechanization cannot be taken for granted. It questions whether a high labour burden and intensity translate into, firstly, demand for labour-saving technologies, and, secondly, to its actual adoption. The study's assumption is that the extent to which objectively identified labour drudgery of women translates in actual demand for and adoption of small-scale mechanization is affected by intra-household gender relations. These gender relations are dynamic: they affect technology adoption, and are also affected by technology adoption.

The approach and analysis of the current study is based on a relational understanding of gender. The gender analysis of the farming system considers material and immaterial aspects of gender relations. It looks at four dimensions: (1) gender division of labour, (2) access to and control over resources, (3) intra-household decision-making, and (4) norms and values. With respect to the farming system, different stages of the agricultural farming cycle are taken into account, starting from the land preparations stage up to the post-harvest/post-production stage, and capturing the stages in-between.

A key characteristic of the study is the differentiation between different household *types* as well as between different individuals *within* households. Because households in Africa are heterogeneous, and gender dynamics manifest themselves differently in different households, the study differentiates between household types engaged in maize farming. For this study, these have been identified as: (1) male headed households (MHHs), (2) female headed households (FHHs) *with* access to male labour, and (3) FHHs *without* access to male labour. In addition to that, an understanding of access to and use by women of mechanized farm technologies requires insight into intra-household relations. This study therefore considers individuals within households.

Methodology

The study is based on qualitative data collection and analysis. The comprehensive analysis is built on field work in four sites. Field studies have been carried out in two countries, and in each country, two sites have been selected: Hawassa and Asella in Ethiopia, and Bungoma and Laikipia in Kenya. These countries and sites are locations where

the FACASI project is implemented. In each site, two weeks of field work were conducted; this took place between June and September 2014.

Data is collected through a set of semi-structured interviews with individuals in different types of households, combined with focus group discussions and key informant interviews. The sampling strategy in each site aimed for maximum variation and data intensity; it covered the three types of household (four MHHs, two FHHs with access to male labour, and two FHHs without access to male labour), and included different individuals per household. In total, 21 interviews were conducted with members of eight households in each site. The complete data set consists of seven FGDs with 45 participants (32 female, 13 male); 86 interviews with members of 33 households (61 female, 25 male); eight interviews with agricultural labourers (all male); and 12 key informant interviews (three female, nine male).

Data analysis employed a grounded theory approach, building on the analytical framework as ‘sensitizing concepts’. Initial data management and analysis was done in field data reports prepared by the national researchers. Cross-case analysis was initiated by the senior researchers, and continued with the complete research team. A validation workshop with CRP MAIZE and FACASI stakeholders further advanced the cross-case analysis, and provided inputs on the formulation of recommendations.

Findings

In Hawassa and in the two Kenyan sites, maize is considered a major food and cash crop and considered important by all household members. In Asella, maize is grown at the homestead and women seem to appreciate maize more than men do. *Labour* is highly segregated: across all sites, only women are responsible for household work and other reproductive activities. Across sites, a significant part of the agricultural work is done by women (household heads, wives, daughters and daughters-in-law). There are variations between the locations in terms of men’s participation in farming. Many women talk about their experience of men disengaging from providing labour to agriculture, and women are taking over tasks that were conventionally done by men.

The farming activities that women consider as contributing to their *labour burden* include: weeding, tillage and land preparation, post-harvest management and transport of agricultural produce. Furthermore, women’s labour burden is affected by chopping and collecting fodder, fetching water, and reproductive labour, especially child care. The ranking of labour intensive tasks varies by context. A key factor in determining whether tasks are labour intensive is the reliance on women’s muscle power: women consider all tasks where they have to solely rely on their own muscle power (such as for weeding, fodder collection or transport of produce carried on their own backs) or hand-tools (as for threshing and grinding) as highly labour intensive.

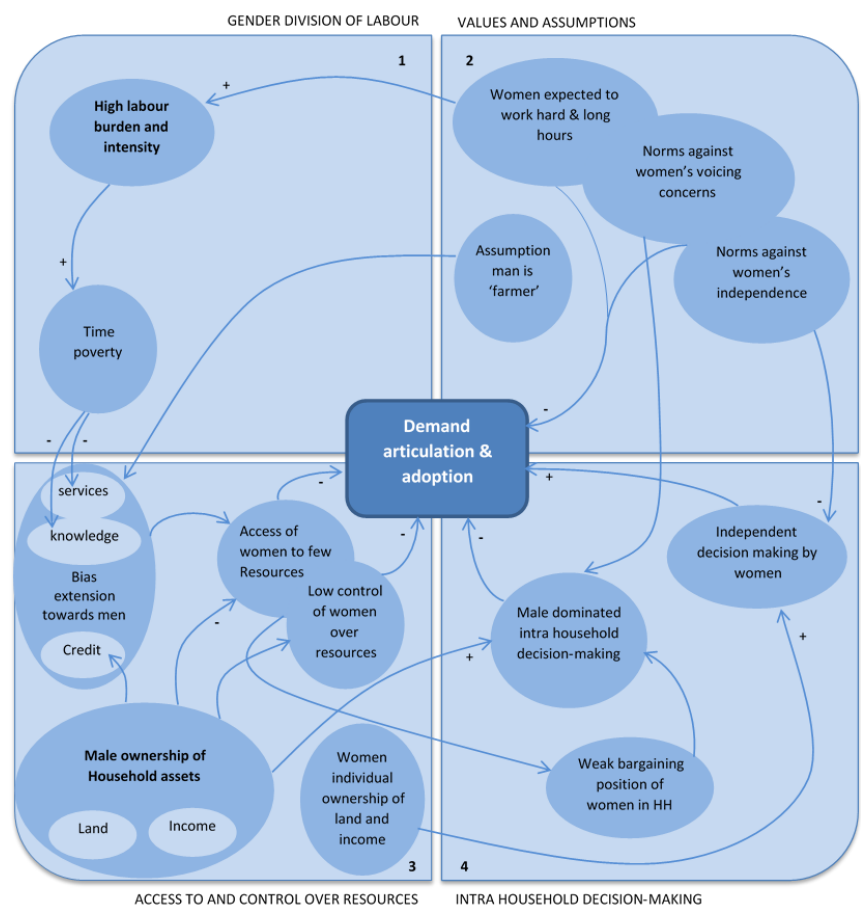
Across sites and household types, hiring labour and animal drafts are the most common *ways to reduce labour burdens*. These apply mainly to reducing labour in the land preparation phase of the farming cycle. They, in other words, do not address many of the tasks that women find most burdensome in the maize farming cycle, nor do they address the labour intensity of women’s reproductive responsibilities. This also counts for tractor power, which is only to a very limited extent used to address the labour intensity of the tasks that women are mostly responsible for. So far, there seems to be been limited experience with mechanization in the study sites, and especially with 2WTs. Tractors are only used in the Kenyan sites and more in Laikipia than in Bungoma.

FHHs have less options and means to reduce labour intensity due to their more limited access to cash and financial resources. FHH without access to male labour have the least options of all households, and they rely primarily on the labour of the members of the household, with particular implications for young women and girls. To reduce their labour burden, women in MHHs mainly rely on using the labour of other household members, and are otherwise dependent on the willingness of the head of the household to invest in other labour saving options such as labourers. The big shift in the reduction of labour and in access to and control over benefits from mechanization occurs for women who own their own resources, either through formal employment or when owning land. Independent control

over resources is a game changer in decision-making in adoption of mechanized equipment to address women's labour.

The first level finding is hence a **paradox**: *women in different ways – that means, in different households and in different sites - experience high labour burden and intensity. Yet, only in exceptional cases, women articulate demand for mechanization and use tractor technology.* The second level finding is this weak articulation of demand for mechanization of women's labour, despite their labour burden and intensity, is due to the *complex interplay of values and assumptions, access to and control over resources, and intra-household decision making.* Factors in each of these dimensions negatively affect women's ability to articulate demand for small-scale mechanization, as visualized in the figure below. Firstly, values and assumptions make women's work invisible and go unrecognized. Women are generally expected to work hard and long hours, and are not supposed to voice their concerns. Secondly, a general and consistent pattern regarding resources is that women lack access to and control over a range of resources, including land, income, and extension services. Thirdly, the gender division of labour exacerbates this limited access, because women's time poverty negatively affects their access to resources and information. Finally, decision-making is a male domain, and women are mostly excluded or merely informed.

The study finds that it is not only the influence of each of these separate dimensions and factors, but especially the way in which they affect each other. That is key to understanding gender dynamics. Many factors *interlock*, and, as the figure illustrates, reinforce each other in undermining women's opportunities to articulate demand and adopt mechanization technology or other options to reduce their labour burden. Norms in favour expecting women to work hard, combined with norms against women voicing their concerns of making decisions, not only directly undermine demand articulation, but also affect women's decision-making power in intra-household decision-making. The low access to and control of women over resources as land and income undermine demand articulation, and also weaken women's bargaining position in intra-household decision-making. It is this interlocking that explains why changes in the gender division of labour do not translate into changes in access to and control over resources. In fact, changes in labour division might occur within the existing status quo, and benefit men. The status quo also remains intact in instances where women's labour burden increases under the influence of men disengaging from agriculture. Cases of remote control by adult sons over resources, income and decisions in female headed households also attest to this point.



Access to and control over resources, as well as values and assumptions are key dimensions of gender relations that constrain, or can enable, women's demand articulation and technology adoption. This conclusion is based not only on an analysis of factors that constrain women's demand and adoption, but also by the exceptions of women in MHHs with sole ownership over land or in formal employment. These are the only women who articulate demand for tractors and actually hire them. The key lesson here is that if interventions do not engage with resources or norms, they are

unlikely to have a *structural impact* on gender relations and women's position. If this is related to the point about interlocking factors and dynamics, the lesson is that unequal gender relations cannot be altered by single solutions or magic bullets, but require *integrated* approaches, acknowledging the interplay between factors and dimensions.

Gender relations are not static, but *changing*. In some sites and some households, women are taking over men's work, and become involved in tillage, ploughing and land preparation. There are also changes in values, with some households and some men increasingly recognizing women's labour burdens and interests. Changes occur also with respect to resources; changes at a relatively small scale, such as women participating in training, or ones with larger implications, such as women inheriting or buying land, women achieving educational qualifications, or women having formal employment. In decision-making, changes can be observed in the degree of sole or joint decision-making. Again at smaller or larger scale, with some women being more involved, or more informed, about household decisions, vis-à-vis women who can take decisions independently.

An important insight is the *variations* in relations and dynamics between sites, between household types and even within household types. The findings point to variations between MHHs and FHHs in terms of options that are pursued to reduce labour burden; with MHHs able to opt for more costly possibilities, and FHHs relying on less costly options. Such differences in adoption can be explained by variations between and among households in access to and control over resources, and the decision-making process, under the influence of values and assumptions.


One important variation is between households in which resources and decision-making are controlled by men, either in MHHs or FHHs under 'remote control', vis-à-vis FHHs in which women own resources and have authority to make decisions. In the latter, demand articulation is hampered by a low assets base and low incomes; in the former two, the household might or might not have more resources, but women have little or no control, and hence are constrained in demand articulation and technology adoption. Whereas the net effect is the same, the instances differ in terms of what the bottleneck is, and hence call for a different remedy when seeking to reduce women's labour burden and enabling their adoption of mechanization.

A related, important observation is that the possibilities and constraints for women in the same type of household also vary. Women in some FHHs have low levels of control over resources and decision-making, whereas women in other FHHs have full decision-making authority. This shows that women's control over resources in households that are not headed by men, is governed in different ways. Variations also occur among women in MHHs; whereas most women in MHHs have limited opportunities to articulate demand for mechanization or to reduce their labour burden, some women who are formally employed or own land individually can and do adopt it. The significance of acknowledging these variations is that options, demand and even benefits cannot be assumed for household types, let alone for individuals within them.

Recommendations

The findings seem to reveal more challenges than opportunities. They call for recognition that a technological intervention is affected by the complex interplay of gender norms, gendered access to and control over resources and decision-making. The findings and analysis hence challenge some of the assumptions of technology oriented interventions, and call for articulation of a theory of change addressing gender equality concerns through technology-focused interventions. Such a theory of change has to find a balance between *being modest* – that is, acknowledging that there are limits to the change an intervention can bring to gender relations and dynamics -, but at the same time *be bold* and brave – by engaging with them and their implications. Such a theory of change also has to engage with how the intervention will not do harm, undermine women's position and reproduce or exacerbate gender inequalities. The recommendations are organized in five clusters.

1. Engaging with technology and its design

-  Take women's needs as an entry point for technology development; this calls for attention for *technologies and approaches* that address labour burden in planting, weeding and processing.

- ✚ Involve women in the *design of technologies* in order to identify new features that respond women's realities, opportunities and constraints.

2. Engaging with norms and assumptions

Project interventions should engage more consciously with gender norms and values that affect women's articulation of demand for and adoption of mechanizations.

- ✚ *Reaching women farmers* through specific targeting strategies:
 - Explicitly seek to include women as contact farmers, women members of farmers organizations, women extensionists, women's groups, and so on.
 - Ensure that the capacity development activities of the project are gender-sensitive (e.g. timing, location)
 - Ensure gender aware dissemination of information dissemination (communications channels, language, timing, sex of service providers and trainers). Design more creative ways of informing and training women about 2WTs (use of local media, ploughing competitions or other events).
 - Deliberately 'show-case' women role models who have used or adopted 2WTs or similar technologies successfully, or women who have challenged gender stereotypes. Also, households with husbands that support women's initiatives to reduce their labour burden and make independent decisions.
- ✚ *Community dialogues* with target communities are innovative approaches to engage with norms and values, by facilitating the discussion of the constraints and opportunities of different women experience as farmers (see also World Food Programme in Ethiopia).

3. Engaging with access to and control over resources

The gendered constraints that women face in articulating demand and in adopting mechanized equipment have implications for the principles of business modeling.

- ✚ *Principles for business modeling:*
 - One entry point is to prioritize the development of business models that target women who face the highest labour burden (including: women in female headed households without access to male labour, as well as, for instance, daughters-in-law in male as well as female headed households).
 - Another entry point is to develop more gendered principles for business modeling. This includes consideration of: (a) integrated approaches, (b) lower input costs, (c) control over inputs and benefits, and (d) multi-functionality.
- ✚ *Follow-up research on business modeling aspects:*

Follow-up research is required to look further into how gender dynamics position and enable different household members to access the mechanization supply chain, both as potential clients/beneficiaries and as potential chain actors. This can include literature review, empirical case studies on existing mechanization technologies, and (participatory) testing of new gender sensitive business models.

4. Group formation and collective action

Learn from the experience of potential service providers and from the extensive body of knowledge on micro-credit for the design of group formation and collective action approaches.

5. The project organization

The dynamic nature of gender relations and the variations between and within household types and sites call for a *gender-sensitive M&E*, of which gender sensitive indicators and continuous monitoring are key requirements. Secondly, the need to respond to gendered constraints calls for a capacity of project staff that includes gender analytical skills as well as ability to engage in conversations on gender norms and constraints, and to deal with resistances.

1. INTRODUCTION

The expectation that demand for maize will rise significantly, between now and 2050, calls for innovative research and interventions that contribute to more productive, resilient and sustainable maize-based systems that improve the livelihoods of rural households. Because agriculture in developing countries relies heavily on physical labour, it has been argued that mechanization can reduce labour constraints, and contribute to higher yields and levels of food security (Sims & Kienzle 2006). However, the adoption of agricultural technology is mediated by the complex interplay of technical, institutional and socio-economic factors (Ragasa 2012).

Gender matters for the adoption of farm power mechanization (Badstue, 2013; FAO 2011, 2013) because women and men have different roles in maize farming and unequal access to and control over resources (Pritchard 2012; Nompumelelo et al. 2009; Doss 2001; Doss & Morris 2001; Quisumbing 1996). The roles of women in agriculture, as well as the social relations in farming, service supply and marketing systems that mediate women's access to resources in general, and agricultural innovations in particular, have often gone unrecognized in the design and delivery of technologies to farmers (Worldbank & IFPRI 2010; Croppenstedt et al. 2013; Meinzen-Dick et al. 2011; Doss & Morris 2001). Yet, agricultural interventions have gendered impacts and new technologies frequently change the labour division as well as the distribution of benefits within households (Meinzen-Dick et al. 2011; Worldbank/FAO/IFAD 2009). With its potential to increase labour efficiency and effectiveness, mechanization directly affects patterns of labour allocations in households, which in turn have direct implications for the well-being of individual household members (Doss 2001: 2076). Because farm power mechanization directly relates to agricultural labour, and is affected by and affects access to and control over resources and benefits, a gender analysis is key to ensuring that gender dimensions are addressed as an integral part of mechanization interventions and research for development (R4D) work.

1.1 - RESEARCH OBJECTIVES AND QUESTIONS

This study presents an analysis of gender dynamics in small-scale mechanization in African agriculture, particularly in maize-based systems in Ethiopia and Kenya. It particularly seeks to identify constraints and opportunities for adoption of and benefit-sharing by male and female farmers in small-scale farm power mechanization. This study offers a conceptual approach to grasp these gender dynamics, a gender analysis methodology, and a set of recommendations. The findings and recommendations of the study can inform the formulation of gender-aware mechanization solutions that can be tested to establish a proof of concept on how to address gender dynamics in small-scale mechanization. The comprehensive analysis presented in this report is built on field work in four sites. The central research question is:

How do intra-household gender dynamics affect women's articulation of demand for and adoption of mechanization?

The key features of the study are:

- It is based on a relational concept of gender. The gender analysis of the farming systems looks at:
 - i. labour (labour availability and labour allocation),
 - ii. resources (including land, assets, agricultural inputs, technology, credit & cash, energy, and human capital),
 - iii. decision-making, and
 - iv. values and norms.

- With respect to the farming system, different stages of the agricultural farming cycle are taken into account, starting from the land preparations stage up to the post-harvest/post-production stage, and capturing the stages in-between those two.
- An understanding of access to and use by women of mechanized farm technologies requires insight into intra-household relations. This study therefore looks at individuals within households.
- Because African households are heterogeneous, and gender dynamics manifest themselves differently in different households, the study differentiates between household type engaged in maize farming. These include:
 - i. male headed households (MHHs),
 - ii. female headed households (FHHs) *with* access to male labour, and
 - iii. FHHs *without* access to male labour.
- The study is based on qualitative data collection and analysis. Data is collected through a set of semi-structured interviews with individuals in different types of households, combined with focus group discussions and key informant interviews.
- Field studies have been carried out in two countries: Kenya and Ethiopia. In each country, two sites have been selected.
- This study has been linked to the work of the FACASI project - Farm Power and Conservation Agriculture for Sustainable Intensification - that focuses on the introduction of specific mechanization technologies, i.e. two-wheel tractors (2WTs).

The analytical and methodological approaches are presented in later chapters of this report. The next sub-section offers more information on the link of the study with CRP MAIZE and the FACASI project.

1.2 - CRP MAIZE AND THE FACASI PROJECT

MAIZE is the CGIAR research program (CRP) on maize-based farming systems. The program is designed to ensure that international agricultural research helps most effectively to improve the productivity of maize-based farming systems, making them more resilient and sustainable and significantly increasing farmers' incomes and livelihood opportunities. CRP MAIZE is led by the International Maize and Wheat Improvement Centre (CIMMYT) with the International Institute of Tropical Agriculture (IITA) as the co-lead institution.

The current study is funded by the MAIZE Competitive Grants Initiative, which allows scientists worldwide to apply for funds to support research and capacity-building activities that will make a significant contribution to MAIZE. This study in particular contributes to MAIZE's Strategic Initiative 1 (SI1) - Socioeconomics and Policies for Maize Futures - which is the strategic initiative that is supposed to provide 'the social science context of MAIZE' (CIMMYT & IITA 2011: 81) and inform the other eight MAIZE SIs. This study also contributes to advancing the MAIZE Gender Strategy in particular output III of the strategy, i.e. the consolidation of the maize gender knowledge base and the initiation of strategic gender research related to known gaps in the knowledge base (Badstue 2013).

A key feature of the study design is the link with an existing MAIZE R4D project based on the assumption that such a link will strengthen the quality of the research, as it allows for capitalizing on the experience of the project partners and for building on and complementing the project's work. To this end the research team has approached the FACASI project (see Box 1). The FACASI project team has welcomed a link to the study as an opportunity to gain more insights on the gender dimensions of delivery and adoption of farm power mechanization.

The entry point of the current study, in relation to the FACASI project, is that the relationship between mechanization and women's labour drudgery cannot be taken for granted. The study hence entails a gender analysis of labour patterns and mechanization demand articulation at household level. The study carefully disentangles what factors affect women's demand articulation and adoption and how, and the inter-linkages between these factors

(Doss 2001, Quisumbing 1996). It is anticipated that a solid gender analysis of intra-household gender dynamics will provide a strong basis for the engagement in the business modeling activities of the FACASI project. The qualitative research design fits the objective of in-depth gender analysis, and complements earlier work carried out by FACASI¹.

The immediate users of the study are CPR MAIZE staff and partners, particularly in FACASI project countries and more globally those involved in advancing the MAIZE Gender Strategy. The study offers CPR MAIZE staff and partners contextual and research-based recommendations on how to better engage with the broader social context within which agricultural mechanization is introduced.

Box 1: Farm Power and Conservation Agriculture for Sustainable Intensification Project (FACASI)

Participating countries: The FACASI project operates in Kenya and Tanzania (since March 2013), and Ethiopia and Zimbabwe (since February 2014).

Timeframe: January 2013 – December 2016

Rationale: FACASI addresses the need for sustainable agricultural intensification in Sub-Saharan Africa (SSA) to meet the demand for increased agricultural production and improved food security.

Goal: The project goal is to address the issue of declining farm power in SSA, and reduce the labor burden that comes with low farm mechanization by promoting small-scale mechanization based on 2WTs. The project focuses on farm power as the ‘forgotten resource’ and is based on the hypothesis that ‘delivery of mechanization to smallholders in SSA may be increased providing the right technologies, the right delivery systems, and the right politico-economic environment are in place’ (Baudron & Gerard 2012: 15). FACASI seeks to test and pilot the technologies of 2WTs, and the business models through which they can be delivered.

Gender concerns: FACASI recognizes that low farm power and high labour drudgery affect women disproportionately (Baudron & Gerard 2012: 9, 24). The project aims to promote access of women to mechanized technologies, and to increase women’s access to resources and benefits of mechanization. Key project questions in that respect are: (a) what tasks to mechanize in order to reduce women’s labour burden, (b) how women’s labour burden translates into demand for mechanization, and (c) how mechanization can contribute to freeing up women’s time for (other) income-generating opportunities.

1.3 – RESEARCH DESIGN, PROCESS AND OUTPUTS

The study involves a literature review, development of a conceptual framework and methodological approach, four field studies, a cross-case analysis, and a stakeholder meeting. This final research report offers a comprehensive gender analysis of factors that shape the articulation of demand for and adoption of mechanization by women in different types of households engaged in small-scale maize farming.

The outputs of this research project are:

- An *analytical framework* informed by literature on gender and technology adoption in maize-based farming for investigating gender dynamics and small-scale mechanization. This framework is based on a literature review on gendered dimensions of technology adoption in general, and small-scale mechanization in particular.
- A *methodological framework* that translates the analytical framework into replicable data collection and analysis protocol.
- Four field data reports documenting the data and the first level of data analysis in each of the four

¹ In 2013, FACASI carried out a study into labour drudgery and small mechanization in Kenya and Tanzania, conducting a total of eight focus group discussions (Misiko et al. 2013).

field work sites.

- A comprehensive cross-case analysis of how gender relations and dynamics affect the articulation of demand for and adoption of small-scale farm power mechanization in farming.
- A detailed set of *recommendations* on how to address gender dimensions as an integral part of small-scale farm power mechanization interventions.

The study team consists of four researchers. Anouka van Eerdewijk and Katrine Danielsen had overall responsibility, and undertook the literature review, design of the study, methodological protocol development, cross-case analysis and overall report writing. Mahlet Mariam and Elizabeth Mukewa took responsibility for the field work in Ethiopia and Kenya respectively, and wrote the field data and analysis reports.

The process of this study is built up around six steps:

- The first step involved the literature review and initial design of the research methodology.
- In the second step, a research methodology workshop took place (at KIT, in Amsterdam, the Netherlands) that brought together the complete research team, and in which the gender specialist of the FACASI project also participated. During this workshop, the research methodology and protocol were further developed.
- The third step consisted of two rounds of field work in each country; that is two field work periods in Kenya and two in Ethiopia. For each field study, a field data report was written.
- The fourth step was an initial cross-case analysis.
- In the fifth step, a stakeholder workshop took place (ILRI campus, Addis Ababa, Ethiopia) that brought together the research team, the FACASI team and key stakeholders from Ethiopia and Kenya. The stakeholder workshop served to share and discuss the field study data and initial cross-case analysis. In addition, the participatory reflection on the findings offered a solid basis for the formulation of recommendations.
- The sixth step covered the final cross-case analysis, and the writing of the overall report.

Table 1 (page 5) presents the process through which this study was carried out.

1.4 – OUTLINE OF THE REPORT

This report includes the findings of the cross-case analysis. In addition to the Introduction, it includes five additional chapters: Literature review (chapter 2), Methodology (chapter 3), an analytical chapter on farm power, gender relations and labour intensity (chapter 4) and another analytical chapter on gender dynamics in demand articulation and adoption of mechanization (chapter 5), and finally Conclusions and recommendations (chapter 6).

Table 1: Process and timeline of research

	April 2014	May 2014	June 2014	July 2014	August 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015
Literature review											
Research methodology design											
Methodology workshop (Amsterdam, May 12-14)											
Finalization research protocol											
Data collection site 1											
Report writing on first site											
Data collection site 2											
Report writing on site 2											
Cross-case analysis											
Stakeholder workshop in Addis (Addis Ababa, Oct 8 and 9 th)											
Finalization field site reports											
Cross-case analysis and finalization of report											

2 ANALYTICAL FRAMEWORK

The analytical framework of this study is based on a review of literature on gender and mechanization. This review served to identify the gendered dimensions of mechanization in maize-based farming systems, and it offered a strong base for the analytical framework of the project.² Key sources are three recent papers that have systematically reviewed literature on the gender dimensions of agricultural technology access and adoption from slightly different entry points:

- Doss (2001): focuses on how gender affects technology adoption and on how the introduction of agricultural technologies affects the well-being of women farmers,
- Peterman, Behrman & Qisumbing (2010): concentrate on the gender differences in access to agricultural inputs including technological resources,
- Ragasa (2012): explores the gender gaps in technology adoption and access to innovations resulting in gender differences in productivity. Her paper explicitly analyses the demand and supply side of technology adoption in line with the conceptual framework of the agricultural innovation systems (AIS) perspective.

A fourth key publication of particular value is Kingiri's (2010) discussion paper on gender and agricultural innovation.

This chapter starts with a general positioning of the state-of-the-art knowledge on gender in agricultural research. It briefly discusses drudgery and labour-saving technologies and then addresses conceptualizations of households in agricultural research and implications for data collection for gender analysis. The core of the chapter presents key lessons on gender and technology adoption. Throughout the reflection on the literature, implications of the lessons for the current study are summarized at the end of each section. In the last part of the chapter, the key insights of the literature review are translated into (1) a set of hypotheses, and (2) dimensions of the analytical framework for this study.

2.1 - GENDER ANALYSIS IN AGRICULTURE

There is a considerable track-record of publications on gender issues and relations in agriculture, and at the same time a recurrent concern and critique expressed in those publications that gender issues continue to be ignored and misunderstood in mainstream agricultural research, and also policy and practice. One common entry point in writings on gender and agriculture, especially in the context of either food security or commercial agriculture, is on yield differentials between female and male farmers, and on related concerns about efficiency as well as agricultural segregation and low-productive traps for women. Key observations are that:

- 'Women often achieve lower yields than men in agriculture', but that 'these patterns are not universal' (Croppenstedt et al. 2013: 2-3).
- Yield 'differences almost always disappear when the level of access or usage of the factors of production are taken into account', which indicates 'that there are no differences between women and men farmers in terms of economic efficiency' (Ibid.: 3).

² The literature for the review is compiled by online searches of published material and working papers and conference proceedings accessible in the public domain and scientific peer-reviewed journal articles accessed through university library. The review concentrates on evidence from Sub-Saharan Africa.

This means that:

‘Women are not worse farmers than men in a technical sense. [...] Rather, women often face constraints in access to and demand for the factors of production that would allow them to have yields equal to men’.
(Croppenstedt et al. 2013: 3)

The constraints faced by women in agriculture are of an institutional and norm-based nature. Moreover, the gaps ‘do not seem to systematically improve with economic growth, household wealth, or overall use of an input or resource in the country’ (Ibid.: 24). This implies that gender differentials are of a systemic nature, and need to be addressed in explicit and strategic ways. For research undertakings, this realization calls for explicit gender analysis of intra-household and community dynamics.

DRUDGERY AND LABOUR-SAVING TECHNOLOGIES

Women’s labor burden is the focus of much research sparked by the concern to address women’s ‘drudgery’. New agricultural technology – including mechanized equipment - is often considered to be labor saving. The FACASI field study on Kenya and Tanzania (Misiko et al. 2013) identified labour peaks and women’s drudgery, and observes a low level of mechanization of women’s labour. This could point to a demand for small-scale farm power mechanization.

Literature suggests that the relation between drudgery and demand for mechanization cannot be taken for granted. It is not only that many barriers might affect actual adoption, but also that technology can have both positive and negative impacts on different members in household. Research shows that new agricultural technologies which are anticipated to save women’s labour, in several cases actually increase women’s labour burden in several ways (Doss 2001):

1. Additional tasks
2. Tasks become more burdensome
3. If the adoption of new technology results in increased levels of output, this might cause a net increase of labor for women because (post-harvest) processing is often women’s work

Important is that new technologies are likely to change labour allocation patterns. Moreover, ‘technology can have a differential impact on women in different regions and levels of household status’ (WB/FAO/IFAD 2009: 296).

Box 1: Definitions of mechanization

Mechanization is defined as the introduction of mechanized farming tools or other equipment (tractors, plows, seeders, and weeders) into farming practices (Peterman et al. 2010, p.4).

- *Use* is defined as the actual application of the mechanical resource in productivity-producing outputs, specifically, at the individual or household level.
- *Access* is defined as the availability or potential for use of a mechanical resource at the individual, household, or community level. Access implies the right or ability to use a resource or input, but not the actual use.
- *Adoption* is defined as the initial use of a mechanical resource by an individual, household, or community that often, but not always, occurs in the context of an established program or scheme (Peterman et al. 2010, p. 2-3).

The concept of ‘drudgery’ needs to be unpacked, and assumptions about the direct links between women drudgery and the existence of and demand for labor-saving needs to be scrutinized. Whether a new agricultural technology, like mechanization, will save labour or not cannot be determined without an analysis of the gender division of labor with a focus on whose labor might be saved and at what point during the agricultural season. This calls for clarity on what households are, and also on what gender analysis entails.

CONCEPTUALIZING HOUSEHOLDS

A key concern is the definition of 'the farmer' in gender and technology adoption research (Worldbank 2009: 289-297; Peterman et al. 2010; Ragasa 2012). Often female and male headed households are compared, but this is in many ways problematic. Firstly, research shows different results from comparing de facto male and female headed households, or de jure male and female headed households (Doss 2001). Headship of a household does not provide insight into intra-household dynamics:

The use of headship of a household as a stratifier masks the details of household composition and intra-household decision-making. It does not provide information on decisions by family members who are not household heads, such as women who farm their own plots in male-headed households. In this case, it may be more appropriate to disaggregate by the sex of the plot manager, rather than by sex of the household head. (Quisumbing 1996: 1591)

Peterman, Berhman & Quisumbing (2010) make the same recommendation. Similarly, Doss (2001) problematizes the household as unit of analysis in agricultural research with reference to intra-household economic models according to which technology development should be based on the needs of individuals and take into account the constraints they are facing within the household (see also Doss & Morris 2001: 37).

Secondly, a crucial critique is that comparing male and female-headed households has shown to provide limited information about a small segment of women, as it ignores the majority of women farmers in male-headed households (Doss 2001). Moreover, female-headed household are also heterogeneous, and include 'women whose husbands have migrated, women who are divorced, and women who are widows as well as some households that are classified as female-headed even though the husband is present' (p. 4). To account for some heterogeneity, it is useful to differentiate between FHH with male of labour age (15-49), and without male of labour age (15-49) (Croppenstedt et al. 2013: 4; see also Doss & Kieran 2014).

Differentiating between different types of households allows for considering the opportunities and constraints of differently positioned women. A study (Apotheker, Laven & Verhart 2012) on gender relations and cocoa farming in West Africa distinguished between four groups of female farmers:

- (1) women managing their own cocoa farms
- (2) women working on a family cocoa farm, while also cultivating a small piece of land
- (3) women working on a family cocoa farm, without cultivating own land
- (4) young women living on cocoa family farms.

Access to land, labour, training, and income, as well as decision-making power, income control and membership of organizations proved to vary for these different types of female farmers (Ibid.).

A third and related concern is that gender and adoption studies fail to look at how different sets of identities (age, class, ethnicity, religion, etc.) impact on access to and adoption of technologies. The too narrow comparison of women and men masks the ways in which gender intersects with other social identities (Doss 2001). An important factor to take into account is age, which allows for differentiating between different women and men in farming households. In the gender and cocoa study young women on farms emerged as a separate group.

Implications of this discussion on the concept of the household in farming for the conceptual framework of our study are:

- ✓ That different types of households are distinguished based on household composition and labour availability:
 - Male-headed households
 - Female-headed households with access to male labour
 - Female-headed households without access to male labour

This distinction of different types of households is critical for our interest in studying gender dynamics, as it allows for grasping the different settings in which gender relations manifest themselves. Put differently, this distinction allows for capturing the variations in gender dynamics across different households.

Another important distinction across the three types of households is land ownership. For male headed households, in particular, it is also important to consider if women members have their own plot of land in addition to the family plots. For the selected sites, land ownership did not prove to be a major differentiating factor in classifying household, because landless households were in negligible fraction in the selected areas.³

- ✓ That members within households need to be distinguished; meaning that data on labour, resources and decision-making has to be collected from different household members.

An important point of attention in all household types are the women members of the households who are not the (first) wife of the male head of the household or the head of the household themselves (such as young women). This is relevant for being able to acknowledge the different opportunities and constraints that differently positioned women might have: there might be considerable differences between the labour provided by a first wife or a daughter-in-law, and also in the conditions under which they provide this labour.

2.2 - GENDER AND TECHNOLOGY ADOPTION IN AFRICA

In what follows, we first discuss gender differences in technology adoption, and then summarize key insights of this in a set of key assumptions. In the next section, we turn to identifying what factors are to be considered in a gender analysis of technology adoption, and explain the key dimensions of the analytical framework.

EVIDENCE OF GENDER DIFFERENCES IN ADOPTION OF AGRICULTURAL TECHNOLOGIES

There is an extensive body of knowledge devoted to the gendered dimensions of technology adoption in agriculture, however not all technologies are covered equally. Peterman et al. (2010) conclude that there are very few (quantitative) empirically-based, household level studies that focus on or include mechanization and other farming equipment disaggregated by gender. The observations presented in this literature review therefore to a large extent draw on literature on gender and technology adoption in general.

Mechanization is briefly discussed as one of the factors of production affecting gendered yield differences by Croppenstedt et al. (2013). They observe significant gaps in male and female headed households' use of mechanization, which are more severe for female headed households lacking access to male labour. Their analysis of data from the Rural Income Generation Activities (RIGA) database (27 countries), suggest that there is little evidence that this gap can be explained by physical differences between women and men, by scale of land operations, or 'thin markets' (p. 13-14). They do suggest that social norms might be a factor, and hypothesize that capital constraints might be a key determinant, but lack concrete evidence to test this (p. 15).

There is general agreement that the gender of the farmer affects the adoption of agricultural technologies (Doss 2001, Peterman et al. 2010, Ragasa 2012). There is, however, a lack of consensus on the actual magnitude and effects of gender differences in access to agricultural inputs (Peterman et al. 2010). According to Ragasa (2010), this can be explained by the lack of research that systematically looks at whether women and men fundamentally differ in their adoption decisions. Indeed, much existing research consistently finds that women have much slower rates of adoption

³ For this study, land ownership was initially considered as a criterion for the sampling strategy; after a first consultation of FACASI stakeholders in the field, it was decided that land ownership is not a major factor differentiating households in the four selected research sites. Landless household were considered a small fraction of the population, and it was suggested to focus more on user rights and tenure, as we do in the analysis.

than men of a wide range of technologies including mechanized resources; many of these studies then seek to explain why women adopt agricultural technologies slower than men sparked by food security and productivity concerns (Ragasa 2012).

Generally in farming systems research, unequal gender relations are taken for granted which according to Kingiri (2010) is why technological innovations tend to benefit men more than women, lessen the workload of men and increase the activities linked to women due to the gender division of labor and unequal access to resources such as processing.

Doss stresses that when women do not adopt new technologies, it is important to understand why, and this has implications for the types of policy responses required. She differentiates between non-adoption due to:

- different preferences, in which case the policy response is to develop, design and test technologies (e.g. seed varieties, tractors, tools) that meet the needs and preferences of women.
- the fact that women face different constraints than men, in which case the policy response is to address these (gendered) constraints. (Doss 2001: 2088).

The existing body of knowledge generally lacks gender analysis from a social relations perspective. For example, Doss (2001) points out that research that investigates how social relations of gender respond to the use, access to and adoption of technology, has so far received little attention (see also Ragasa 2012). She argues that existing studies fail to disentangle different key factors and how they are related; how factors affect technology adoption remains unclear.

Another key point is that gender relations are dynamic, rather than static, and this relates to how gender roles and responsibilities in farming and in households change, often in response to changing circumstances:

As the opportunities for one group of people increase – whether they are women, children or smallholder farmers – their relationship with others in their household and their communities are renegotiated. [...] Often those individuals with greater power and access to resources are able to take initial advantage of a change in circumstances, regardless of who are the targeted beneficiaries. (Doss 2001: 2076)

New technologies can for instance change labour allocations or control over resources in a household. This means that the impact of technology, and mechanization in particular, cannot be easily predicted.

Finally, the willingness to adopt is also based on expectations different members of a household on possible changes. That is, individuals might anticipate a certain positive or negative effect, based on earlier experiences or on their understanding of the social relations in the household. So, apart from actual change, people also act on the basis of their anticipations of how technology will or might affect relations, roles and responsibilities. The interest of women in mechanization is then also affected by their expectation of whether the benefits will reach them, when labour divisions and control over benefits change in response to the newly introduced technology (Doss 2001).

These points are well summarized in a conclusion of Doss on what the data needs are for gender analysis in agriculture:

To support gender analyses in agriculture, data collection efforts need to do two things. First, they need to ensure that women farmers are interviewed and that their voices are counted. Second, the information should identify which people are involved in various activities, as owners, managers, workers, and decision makers. It is important not simply to assume that one particular individual does these activities based on social norms, but instead to ask the questions to allow for a range of answers that can demonstrate how the gender patterns in agriculture are changing. (Doss 2013: 11)

Without an in-depth appreciation of intra-household dynamics it is impossible to anticipate how women farmers will react to new technologies. In any event, there might be both negative and positive effects of adoption, but in the end it must be women farmers themselves who judge the net effect (Doss 2001). Moreover, due to the inter-linkages between key factors, it is difficult to disentangle causes and consequences of technology adoption (Doss 2001).

Implications for our study are that:

- ✓ In-depth gender analysis of farming practices – based on a relational understanding of gender and applying key conceptual tools such as gender division of labor, access to and control over resources and benefits as well as intra-household decision making - is pivotal for understanding the gender dimensions of mechanization.
- ✓ The dynamic nature of gender relations in households and farming, including expectations and anticipation on potential future reallocations, need to be acknowledged and investigated.

Box 2 - Key assumptions gender relations and technology adoption

The research approach of this study is based on the following key assumptions, derived from the existing insights in the literature:

1 - *The actual articulation of demand for small-scale mechanization is affected by gender dynamics.*

The FACASI field study report in Kenya and Tanzania (Misiko et al. 2013) has identified labour peaks and women's drudgery, and observes low level of mechanization of women's labour. The current study hypothesizes that intra-household gender relations affect the extent to which objectively identified drudgery and mechanization demand translate in actual articulation of mechanization demand. This requires insight into how gender relations and intra-household dynamics affect demand articulation.

2 - *Access to and adoption of mechanization is not only affected by intra-household dynamics, but also by access to complementary inputs.*

Existing research shows that women's lack of access to complimentary knowledge and inputs, i.e. through agricultural extension, explains gender-based differences in use and adoption of agricultural technologies.

3 - *Gender relations and intra-household relations are not static, but dynamic. This means that gender dynamics not only affect technology adoption, but technology adoption in turn affects labor allocation and control over benefits.*

More specifically, studies have indicated that (a) mechanization can affect labor allocations within households, and (b) that increased productivity, reduced drudgery or increased profitability can lead to a reallocation of control over outputs (i.e. male household members taking over previous women's work when it becomes less labor intensive or more profitable).

4 - *The dynamic nature of intra-household relations affects demand articulation for mechanization.*

Different household members might anticipate the potential impact of technology and mechanization on the division of labour, control over resources and benefits. This implies that the interest of women farmers in technology in general, and mechanization in particular, is affected by the awareness of women farmers that the benefits of mechanization, reduced labor or increased benefits, might not necessarily or directly reach them.

2.3 - A GENDER ANALYSIS OF TECHNOLOGY ADOPTION IN AGRICULTURE

The literature reviewed suggests that gender differences in the adoption of agricultural technologies are linked to the gender division of labor, the unequal access to resources between women and men as well as gender inequitable decision-making processes. This section is structured along these three gender analytical concepts.

GENDER DIVISION OF LABOR

We already discussed how technology can affect labour allocation patterns, but how does the gender division of labour affect adoption and use of technology, especially mechanization. This calls for insight into who does what in farming and in different stages of the cycle. It is also important to understand in what capacity (owners, managers, decision-makers, etc.) household members work. The gender division of labour has implications for drudgery and for peaks in labour experienced by different household members.

To understand levels and processes of technology adoption, one first needs to look at the availability of labor to the household and its individuals (Doss 2001). Women can mobilize labor in different ways: from within the household, from workgroups or in the market. Compared to men, women's access to labor in all these three sites is curtailed by gender roles (including the allocation of reproductive tasks to women) and unequal gender relations which have to be analyzed in detail as they are context-specific.

Evidence suggests that women's use and adoption of labor-saving and energy-saving technologies is also constrained by norms and values about culturally appropriate gender roles. In general, it is rare for women to use tractors and other mechanized farm equipment in Sub-Saharan Africa (Ragasa 2012 (p.9) citing Singh and Kotwaliwale 2011).

GENDERED ACCESS TO AND CONTROL OVER RESOURCES AND BENEFITS

With respect to *resources*, existing research shows that gender-based differences in use and adoption of agricultural technologies exist because of lack of access to complimentary knowledge and inputs (Peterman et al. 2010, Ragasa 2012). All three literature reviews suggest that access to education, information and agricultural extension is a key determinant of the use and adoption of new technologies and farming practices (Doss 2001, Peterman et al. 2010, Ragasa 2012). They affect the extent to which drudgery as an 'objective base' for demand for mechanization might or might not translate into effective demand.

Affordability and access to financing can explain that women often rely on less mechanized and more labor intensive technologies than men. The reported value of farm tools owned between male-headed and female-headed households and difference in use and ownership of draft animals and tractors, are likely to be attributed to the relative affordability of these technologies coupled with women's less income and asset holdings and less access to credit than men (Ragasa 2012, p.11, citing a number of studies).

Another factor seems to be access to and control over remittances (typically from male migrants) which are often used to finance farming. They give opportunities to hire labor and capital to increase inputs (Doss 2001).

With respect to access to and control over *benefits*, many studies point out that gender disparities persist throughout agricultural value chains, as women farmers receive lower prices for produce and have poor access to markets (Peterman et al. 2010). A key concern here also is who actually sells farming products, and what happens to the income generated in this way. Earlier it was mentioned that adoption of new technology can result in an increased level of output. Studies have shown that men typically move into women's activities once they become profitable with the result that women's control decreases (Doss 2001). The risk of male capture of control over resources and benefits can affect women's adoption of agricultural technology negatively.

GENDER RELATIONS AND DECISION-MAKING

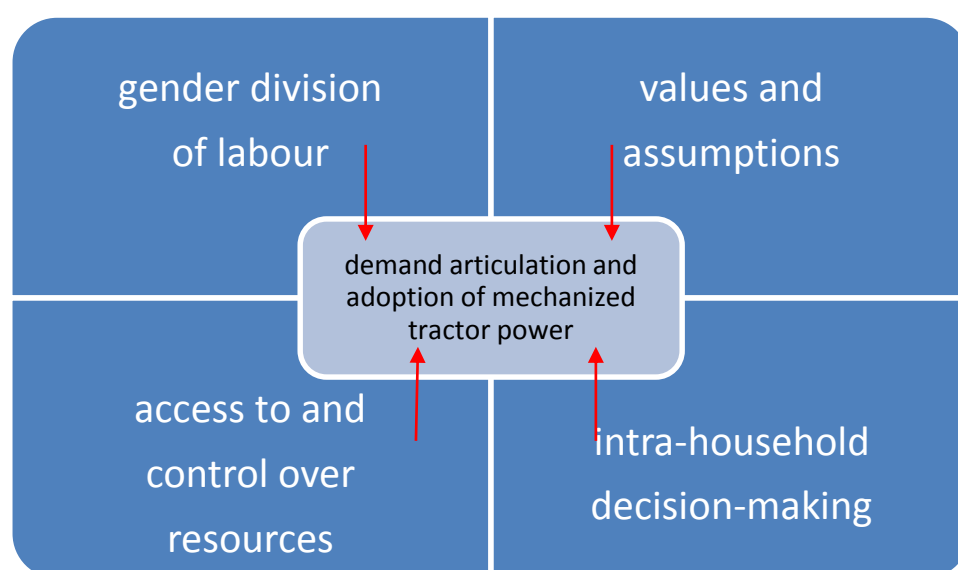
It is not only who does what or who has which resources, but especially a matter of who controls these divisions, and who has what say in decisions. The first point here is to recognize that ‘households do not act in a unitary manner when making decisions or allocating resources’ and ‘women and men within households do not always have the same preferences or pool their resources’ (Meinzen-Dick et al. 2009: 4)⁴. Indeed, the household has dimensions of both cooperation and conflict, as captured in Amartya Sen’s notion of the ‘cooperative conflict’.

Gender relations and intra-household decision-making processes affect technology adoption. For example, women’s time is less valued and farmers are therefore more likely to decide to invest in and adopt technologies that save men’s time (Doss 2001). This could potentially undermine the adoption of multi-functional mechanized technologies (i.e. technologies that can be used for land preparation as well as post-harvest processing which is often a women’s task) as it might be less likely that investments are made in technologies that benefit women more than men.

ANALYTICAL DIMENSIONS

The gender analysis pursued in this report takes into account both the material and immaterial aspects of social relations of gender (see also Mukhopadhyay et al. 2010; Fraser 2000). As figure 1 shows, the analytical framework of this study hence consists of the three dimensions coming forward from the literature review, complemented with a fourth dimension: values and norms.

Figure 1: Analytical framework



The first dimensions is the *gender division of labour* and this dimension calls for an analysis of productive tasks (all crops, vegetable gardens and income generating activities), reproductive tasks and community related roles. It covers different stages of the farming cycle, from land preparation to post-harvesting. A gender analysis calls for unpacking what labour is provided by different members, male and female in the household. For this study, a specific interest is to identify where different household members experience labour intensity.

⁴ Not only are there gender disparities in the control of agricultural inputs, but a growing body of empirical evidence suggests that increasing women’s control of resources has positive effects on a number of important development outcomes, including food security, child nutrition, and education (Meinzen-Dick et al. 2009: 4).

The second dimension is the one of *values and assumptions*. Gender norms and values are a set of social rules and assumptions about what men and women should do, how and with what resources, and the status of individuals and their relative value in society. Gender norms draw upon and reinforce gender stereotypes, which are widely held, idealized beliefs about women and men, and are constantly changing. A first concern here is to look at the value that is given to the labour of different household members. With respect to women, this requires insight into the extent to which their labour is recognized, as well as insight into the value that is attached to it. This dimension reveals some major assumptions behind the gender division of labour. In addition, other strong values affecting women's roles, constraints and opportunities can come to the fore. These can include norms related to women's involvement in financial transactions, but also to for instance women's mobility. With respect to mechanization, special consideration is required for assumptions around women's use of technology and machines, and the cultural acceptability of technologies (e.g. Ragasa 2012).

The third dimension in the analytical model captures *access to and control over resources*. The set of resources to be considered here is potentially broad. It includes ownership and access to land, but also other productive resources like trees, plants, as well as production tools like mechanized equipment or draft animals. Inputs for farming are also important resources, and can include seeds, fertilizers, water, fuel, fodder, as well as credit, but also knowledge, information and extensions. A key resource in terms of control is labour, both one's own and the labour of others in or outside the household. For gender analysis, control over benefits and income is also of critical relevance. Other potentially relevant resources includes access to groups and organizations, as well as access to and control over media such as radios or mobile phone technology.

A fourth and strongly related dimension is *intra-household decision-making*. It is strongly related to control over resources, but merits separate consideration in order to be able to see how control over resources affects actual decision-making process and power. This study considers decision-making around acquiring or sale of assets, decision-making over labour allocations, and decision-making around income and benefits. Analysis of decision-making seeks to shed light on who is involved in which decisions, and also seeks to unpack the nature of that involvement. It will be important to not only look at dominant norms, but also at how people deviate from and renegotiate those.

The analytical framework and gender analysis of this research goes beyond the farming system. While the focus of the research is on mechanization in agriculture, a broader analysis of labour issues of productive as well as reproductive tasks is needed in order to establish their interconnectedness and how they affect what is happening in farming. With respect to the farming system, different stages are taken into account (a) the land preparation stage, and (b) the post-harvest/post-production stage. The reasons for focusing on these two, is that mechanization can affect the two stages differently. 2WTs can reduce labour demands in the land preparation stage when used for tilling and related tasks. In case a multifunctionality approach to mechanization is pursued, the 2WTs can also be connected to e.g. milling and transportation equipment; this can then also affect labour peaks and drudgery in the post-harvest stage (see also Misiko et al. 2013). Apart from the differential mechanization effects in these two stages, the gender dynamics might also differ between these two stages with respect to both labour allocation as well as output allocation (Doss 2001). If women perceive benefits of mechanization in for instance the post-harvest stage, they might also be more interested in 2WTs. In the research, these observations are translated into an explicit focus on the four dimensions of the analytical framework in and around these different stages and key tasks within them. A final comment to be made is that the research does not solely focus on maize farming but on the farming done in the selected sites.

On the basis of the key assumptions and the four dimensions of the analytical framework, the central research question has been broken down into the sub-questions presented in box 3, on the next page.

Box 3: Research questions

How do intra-household gender dynamics affect women's articulation of demand for and adoption of mechanization?

- 1) What are the main types of HHs in which women engage in farming?
- 2) What is the place/role of maize farming in the livelihoods of the different HHs (as well as agricultural labourers)?
- 3) What is the labour intensity of different activities in the farming cycle for different members of the HH?
 - a. What is the gender division of labour? (age)
 - b. Implications for young women and girl child?
 - c. How is women's work/time valued?
 - d. What activities do women consider the most labour intensive and why?
 - e. What are women's needs with regard to labour?
- 4) What are options to reduce labour intensity/burden?
 - a. What is already done?
 - b. How do access to and control over resources and decision-making affect options (and values and assumptions)?
- 5) What are earlier experiences with mechanization in farming?
 - a. New trends in mechanization?
 - b. What factors affected mechanization (resources, benefits, decision-making, values)
 - c. What have been the consequences for different women?
- 6) What are earlier experiences with accessing technology of women's groups/organized women (focus on mechanized tools, but also experiences with other technologies if relevant)?
 - a. What was accessed and how?
 - b. What are the challenges and opportunities?

This study is based on a qualitative research methodology. Qualitative research designs are informed by specific principles for sampling, data collection as well as analysis. The strengths of qualitative research lie in the holistic or integrated approach to the topic and context under study, aiming for an understanding of the arrangements in social realities, their logics, practices, and implicit and explicit manifestations and rules. Qualitative research has a specific interest to understand social reality from the way it is experienced and expressed by the subjects themselves, rather than capturing that in predefined instruments and analytical procedures. Indeed, 'a main task is to explicate the ways people in particular understandings come to understand, account for, take action, and otherwise manage their day-to-day situations' (Miles & Huberman 1994: 7). In contrast to quantitative research, there is relatively little standardization of research instruments and analytical procedures; that does not mean that qualitative research lacks objectivity. Rather, the analysis builds on, but is not confined to the perspectives of the research subjects. Moreover, quality of research is ensured by the guidance of principles, and this applies to all stages of the research process, from sampling, to data collection, to data management and analysis, and eventually writing (Malterud 2001; Flick 2007). Because the researcher cannot rely on methodological protocols, but has to account for quality and principles, reflection is a key feature of qualitative work. In this chapter, we explain and justify the methodological decisions that were made in different stages. We start with sampling of the sites and locations, continue with data collection (including the sampling of respondents), and end with the data management and analysis.

3.1 - SAMPLING OF SITES AND LOCATIONS

Sampling in qualitative research is done in a fundamentally different way and following a fundamentally different logic than in quantitative studies. Sampling is done on a purposive ground and is theory-driven (Miles & Huberman 1994: 15-39; Flick 2009: 91, 114-126). A qualitative study is not focused on making claims about a population, but on making claims about a phenomenon, that is a social process. That means that the sample does not seek to represent the total population of, in most cases, people; rather, the sample needs to capture the manifestations and aspects of the phenomenon. This calls for a sample of processes and events that allow for understanding the conditions under which the phenomenon operates. Sampling does then not require random selection, but a well-grounded, theory-driven approach to selecting those instances in which the diversity of the manifestation of the problem can be observed. In this study, the focus is on gender dynamics and how they relate to women's demand articulation for and adoption of mechanized agricultural technologies in FACASI sites. The sampling strategy requires firstly to delineate the geographical areas in which data collection took place; next the sampling strategy indicates where and how the phenomenon of gender dynamics in relation to demand articulation and adoption can be captured. The choice of sites and location is presented in this sub-section, the subsequent selection of respondents is discussed in the next.

The study focuses on two of the four countries that the FACASI project is working in: Kenya and Ethiopia. In each of those countries, FACASI is implemented in two sites; the field studies have been carried out in both these sites.⁵ That means that, in Kenya, field studies were conducted in the counties of Laikipia and Bungoma, and that in Ethiopia, they were conducted in the districts of Asella and Hawassa.

Within each of the two FACASI sites per country, data was collected in one location, so as to ensure that the

⁵ In the design phase of this study, two options were considered for field studies. One option was to work in one site per country, and employ a two-phased field research, in which the second phase would focus more in implications of gender dynamics for business modeling. The second option was to conduct field work in two sites per country; this would allow for a comparative analysis between the countries as well as the sites within the countries. In consultation with FACASI, it was decided to go for the second option.

researchers had as much time as possible on collecting data and engaging with respondents, as opposed to travelling. Working in one location also allowed for having adequate time to familiarize themselves with the setting, developing relations with local people and meeting respondents that are not easy to reach. These are all important to safeguard the quality of the collected data. In both sites in Ethiopia, data collection took place in two neighboring kebeles that were very close to each other; in Kenya, data was collected in one sub-county in each district. Table 2 gives an overview of the selected sites and locations in both Ethiopia and Kenya.

Table 2: Selected sites and locations for field research

Countries	Ethiopia		Kenya	
Sites	Asella (district)	Hawassa (district)	Bungoma (county)	Laikipia (county)
Locations	Xiyo woreda (Dosha kebele & Haro Bilallo kebele)	Hawassa Zuria woreda (Dore Bafano kebele & Jara Golloлча kebele)	Kaduyi sub-county (Bukembe East Ward)	Laikipia East sub-county (Umande Ward)

The specific locations in each site were selected in consultation with the national partners of FACASI. The criteria for selection were:

1. Accessibility (important with respect to efficient use of available time and resources for study)
2. Quality of institutional relations of FACASI in the location (important with respect to efficient use of available time and resources for study)
3. Maize-farming communities (important because the CRP grant comes from CRP MAIZE): it has to be noted that the Asella district in Ethiopia is a FACASI site, but wheat is the major crop grown here. However, some farmers are growing maize as a subsistence crop, and they will be focused on.
4. Presence of three types of households (important feature of the research design)
5. Level of organization of women, in the sense of membership of women's groups, farmers' organizations or cooperatives (important for potential access to technologies, resources, markets, etc.)

3.2 - DATA COLLECTION METHODS AND SAMPLING OF RESPONDENTS

In each site, the same strategy for data collection was followed. Field work in each of the four locations took two weeks. The first round took place in June 2014 (in Asella, Ethiopia, and in Bungoma, Kenya); the second round took place in second half of August (Laikipia, Kenya) or first half of September (Hawassa, Ethiopia). The two field researchers were introduced to the field through FACASI and its partners in the respective sites. In the two Ethiopian sites, the field researcher was accompanied by a carefully selected and well-prepared translator, translating from/into Sidama (in Hawassa) and Oromifa (in Asella).

The main method for data collection was semi-structured interviews with different household members in the three household types. The data collection strategy in each site is based on a purposive sample, build up on theory-based sampling strategy, based on the principle of *maximum variation* and *data intensity* (Miles & Huberman 1994: 27-35; see also Flick 2009: 115-126). This implies, firstly, capturing the variation across different household types (Doss & Kieran 2014), and secondly, collecting data from different members in the household (see also section 2.1). The working definition for each household type is as follows:

- FHH with access to male labour (FHHWAML) are households headed by widowed or divorced women, who are living with their daughters and/or daughters-in-law, and whose sons live in that same homestead;
- FHH without access to male labour (FHHWOML) are also headed by women, who live with their daughters and daughters-in-law, but whose sons live away from the community, often having migrated to and being employed in cities. Male headed household (MHH) are household headed by a man, who lives with his wife (or wives), sons, daughters and sometimes daughter in-laws in the same homestead.

The set of household interviews was complemented with one women-only focus group discussion, two to four key informant interviews, and two semi-structured interviews with agricultural labourers. Whereas qualitative research benefits from long-term engagement of the researcher with the field and the different respondents, the quality of studies that are conducted within a shorter and more delimited time frame benefit strongly from sampling strategies informed by typical and exceptional cases (Flick 2009: 34). The explicit sampling strategy of the current study, in terms of the household types and selected individuals within each household, and complemented with the key informants, agricultural labourers and the focus group discussion, is based on those principles and allows for generating a rich data set of the phenomenon under study. In what follows, the different data collection method will be briefly discussed, after which an overview of the complete data set will be presented.

FOCUS GROUP DISCUSSION

In each location, one Focus Group Discussion (FGD) was held. The purpose of the FGD was to collect information into the gender division of labour within the different household categories. By collecting these data in a FGD, the interviews with individual household members could focus more on other aspects of the gender dynamics. The findings from the FGD were documented in a data sheet that captured (a) production, household, processing and transportation tasks, (b) gender division of labour (roles, frequency), (c) labour intensity, (d) source of power and access to technologies, and (e) factors affecting mechanization.

The FGD ideally took place with a group of six to eight women. These selected women represented three main household categories: male headed households (MHHs), female headed households (FHHs) *with* access to male labour and FHHs *without* access to male labour. The FGD also included young women members of households (or other women who are not the first wife of the male head of the household or the female head of the household).

It was only in Hawassa that multiple FGDs were held, because the two kebeles were at too far a distance from each other to easily bring together one FGD in one location. Moreover, although the invitation was for women only, male relatives wanted to participate in the discussions, and it was decided to have a men-only and a women-only FGD in each location.

INTERVIEWS WITH KEY INFORMANTS AND AGRICULTURAL LABOURERS

Key informant interview were conducted with three informants from the location. The KIIs focused on the experiences with mechanization in the location as well as an overview of organizations (including women's groups, farmers' groups and cooperatives) through which women might articulate their needs and demands and/or access to mechanization. The key informants were government staff, field extension officers, representatives of community-based organizations, NGOs or research institutes working on agriculture. In total, twelve key informants were interviewed; three of them were women.⁶

In addition to the key informant and household interviews, two agricultural labourers were interviewed in each location. These were all male labourers, and worked mostly in male-headed households, but some of them worked in

⁶ The women included: (1) a female representative of the regional Women, Children and Youth Affairs Office in Hawassa, (2) a female secretary of a community-based organization in Bungoma, working with maize farmers from female headed households, and (3) a female extension officer in Laikipia.

female headed households as well.

IN-DEPTH INTERVIEWS WITH HOUSEHOLD MEMBERS

In each location, a total of 21 interviews were conducted with individual members of households. Table 3 below sets out the sampling strategy that was to be followed in each location. The interviews with individual household members addressed the importance of maize farming (to the household and to them individually), labour intensity and options to reduce it (in household, but especially for that individual), access to and control over resources, intra-household decision-making, norms and values, and earlier experiences with mechanization and with organizations (farmers groups, women's groups, etc.).

Table 4 provides an overview of the total data set across the four sites. It shows that, in total, 105 women and men from 33 households in four sites were individually interviewed. In addition, twelve key informants and eight agricultural labourers were interviewed, and 43 women and men participated in seven FGDs. In total, 97 women and 54 men participated in the study.

3.3 - DATA MANAGEMENT AND ANALYSIS

This study has employed a grounded theory approach to analysis, which means that the data analysis is focused on identifying key components and categories of the social phenomena (gender dynamics, women's demand articulation and technology adoption), and how they relate to each other. The approach is inductive, in the sense that the components and their interrelations are not predefined, but build up from the data set. The analytical framework presented in chapter 2 serves as 'sensitizing concepts', that do not predefine the social reality captured in the data, but assist the researcher in 'the formulation of questions addressed to' the data set (Flick 2009: 307). Which categories and components are relevant is based on the data, and the same counts for which relations and what shape they take.

Qualitative data analysis involves three types of activities: data reduction, data display, and verifying conclusions. Data reduction 'refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up field notes or transcriptions' (Miles & Huberman 1994: 10-11). Data display seeks to organize and compress the range of information in ways that assist the identification of patterns, trends, exceptions, relations and connections. In qualitative data, data is most frequently displayed in text. Explicit structuring of the data in for instance tables, matrices, graphs can assist the analysis. Both data reduction and data display are key steps in managing a qualitative data set. It is important to acknowledge that this data management is not separate from, but part of the analysis.

In this study, data management and initial analysis was done in two ways. Firstly, the field researchers documented the data from the interviews in a set of data coding sheets that were developed in the methodology workshop prior to field work. Secondly, the field researchers wrote a field data report, based on an agreed field report format that was organized around the sub-questions presented at the end of chapter 2 (see box 3). The data recording sheets and the field data reports⁷ hence represent the first step in data management and analysis.

Data reduction and data display allow for a next and critical step in data analysis: drawing and verifying conclusions. The focus of qualitative analysis is to identify 'regularities, patterns, explanations, possible configurations, causal flows

⁷ The field reports are not published, and are available upon request:

Hailemariam, Mahlet (November 2014). *Field data report Ethiopia – Hawassa Zuria Woreda*. Amsterdam: KIT.

Hailemariam, Mahlet (November 2014). *Field data report Ethiopia – Xiyo Woerda (Asella Zuria Woreda)*. Amsterdam: KIT.

Mukewa, Elizabeth (November 2014). *Field data report Kenya – Bungoma County*. Amsterdam: KIT.

Mukewa, Elizabeth (November 2014). *Field data report Kenya – Laikipia County*. Amsterdam: KIT.

Table 3: Purposive sampling frame for individual interviews by household type (for each location)

Type of HH	Male headed HH			Female headed HH with access to male labour			Female headed HH without access to male labour		All HHs
Number of HHs	4			2			2		8
Selected HH members for interviews	Male head of HH	Wife of HH head	Other female HH member	Female head of HH	Male HH member	Other female HH member	Female head of HH	Other female HH member	
No. of interviews	4	4	3	2	2	2	2	2	
Total no. of interviews	11			6			4		21
No. of interviews with HH heads	4			2			2		8
No. of interviews with HH members		7			4			2	13
No. of interviews with men	4				2				6
No. of interviews with women		7		2		2	2	2	15

Table 4: Overview complete data set in four sites

Data type	Hawassa	Asella	Bungoma	Laikipia	Total
FGDs (no.)	1	4	1	1	7
Total no. FGD participants	9 women	7 women 13 men	8 women	8 women	32 women 13 men
MHHs	4	4	4	4	16
Male HH head	4	4	4	4	16
Wife of male HH head	4	4	4	4	16
Other female HH member	3	2	3	3	11
FHHWAML	2	3 ⁸	2	2	9
Female HH head	2	3	2	2	9
Male HH member	2	3	2	2	9
Other female HH member	2	3	2	2	9
FHHWOML	2	2	2	2	8
Female HH head	2	2	2	2	8
Other female HH member	2	2	2	2	8
Key informant interviews	3	3	3	3	12
Agricultural labourers	2	2	2	2	8
Total HHs	8	9	8	8	33
Total interviews	26	28	26	26	106

⁸ The number of interviews with FHHWAML is higher than in the sampling strategy; during fieldwork it was necessary to speak to more FHHWAML to cross-check on emerging trends in the data. In addition to the three FHHWAML mentioned in the table, informal interviews were done with two more households in this category.

and propositions' (Miles & Huberman 1994: 11). These are identified through a set of coding practices. Open coding is the first step in the coding process in which the initial categories and observations are formed and applied to structure the data. The second step, axial coding, seeks to further refine and structure the codes, categories and relations. Special attention is paid to connections and relations between codes of different levels and among codes at the same level. These patterns and regularities are identified on a combination of theory-driven observations (constructed codes) and emerging insights and findings coming forward from the data set (*in vivo* codes). A key principle in the coding process is the comparison of contrasting cases (this also explains why variation is an important principle in sampling) (Flick 2009: 310-314; Flick 2007).

The third step entails selective coding; this is the stage of drawing and verifying conclusions. The first two steps of the coding processes have resulted in emerging conclusions about what are relevant categories, concepts and dimensions, as well as their interrelations. A key principle in this stage of the analysis is analytical induction. 'Analytical induction is a method of systematic interpretation of events, which includes the process of generating hypotheses as well as testing them. Its decisive instrument is to analyze the exception, the case which is deviant to the hypothesis' (Znaniecki 1985, p. 476, in Flick 2009: 406). Put simply, the researcher has to be its own devil's advocate: when a regularity emerges, it has to be checked against *all* data to see if it holds. The aim is not necessarily to dismiss the emerging 'grounded theory', but to further refine it. The result is not a theory that captures most manifestations of the phenomena, but one that accounts for all exceptions and hence captures all variations. This makes the theory stronger; the purpose of selective coding, and the principles of deviant cases and analytical induction, is to arrive at a comprehensive analysis.

In this study, the open and axial coding was first carried out by the national researchers when completing the data coding sheet and writing the field reports. The initial cross-case analysis further contributed to this coding process, and also pushed it into selective coding by looking for similarities and commonalities in observations between and across sites, household types and individuals. The emerging insights from this initial cross-case analysis were then further discussed and validated with the national researchers. The validation workshop (October 2014) allowed for further reflection with the research team as well as FACASI staff and stakeholders, of both the findings and analysis of both countries separately, and of the initial cross-case analysis. On the basis of these reflections, the field data reports were finalized by the national researchers, and the cross-case analysis was continued by the KIT researchers. For the report writing, constant comparative method and analytical induction were key principles applied to arrive at a solid analysis of the gender dynamics across the different sites on women's demand for and adoption of mechanization. This meant that the KIT researchers validated the emerging analysis against the field reports and data coding sheets in order to further refine and articulate the dynamics and relations. The draft report has been finalized after being reviewed by all team members, two internal reviewers from KIT, and two reviewers from FACASI and five from CIMMYT.

4. FARM POWER, GENDER RELATIONS AND LABOUR INTENSITY

In this first chapter presenting the analysis and findings from the data, we start with a brief characterization of the four study sites. Next, labour burden and intensity will be discussed in detail, as a basis to understanding the nature of ‘the problem’. This includes a discussion of both the division of labour, and an identification of tasks that contribute to high labour burden and intensity. Following that, we will discuss which options are pursued by which households and in which sites to reduce labour burden. There we also discuss women’s experiences with organizing in groups. The chapter concludes with a brief indication of the implications of women’s high labour burden.

4.1 – CHARACTERIZATION OF THE SITES

IMPORTANCE OF MAIZE

In our study we have focused on small scale farmers in selected sites in Kenya and Ethiopia. Like in most of Ethiopia, agricultural producers in the districts of Hawassa and Asella are subsistence farmers with small holdings, often broken into several plots. The average land holding in Hawassa is 0.17 ha per household, and in Asella the average is 0.85 ha. In the Kenyan counties Bungoma, the average land holding is 3 acres per household, while it is between 3 and 20 acres in Laikipia.

Maize is a major subsistence and cash crop in both sites in Kenya and Hawassa, in Ethiopia. In these three sites, maize is the main source of carbohydrate in most households’ diets and also an essential income source. Moreover, maize stock is widely used for fuel and fodder.

In the Kenyan sites, income from the sales of maize is used to purchase diverse household needs such as supplementary food stuff, farm inputs like chemical fertilizers, manure and seeds, medical expenses, clothing, and school supplies for children, in addition to assets such as cattle or small ruminants as well as utensils and furniture. Also, agricultural labourers’ wages, hiring of draught animals and in exceptional cases, hiring of four-wheel tractors, are paid from the maize income. Maize also plays a significant role in the education of children in the study areas. In both sites, income from maize is used to cover tuition expenses and in Bungoma a “maize for tuition program” allows many families to cover schooling fees with part of their maize harvest. Some interviewees indicate that more boys than girls benefit from the “maize for tuition program” in Bungoma. In Laikipia, the general perception is that girls and boys have equal access to schooling in maize growing households with the exception of some interviewees in FHHs who imply that their boys would be given preference in times of limited income.

In Hawassa in Ethiopia, maize is a major source of income which is used for major investments, agricultural inputs, and also household needs such as salt, sugar, oil, soap, gasoline and sometimes school supplies and clothes. In Asella, maize is not grown widely. It is considered a minor crop and only grown at the homestead. Still, women in particular seem to appreciate maize because it serves multiple purposes and ‘nothing is thrown out’: the seed can be consumed by people, cattle and chicken, the stock and leaves serve as cattle feed, and the remainders can be used as fuel. Women mix maize with barley or wheat to make bread or *injera* or to make the alcoholic drink *arekie* for household consumption and to generate some income from selling it. The byproduct of the *arekie* is also useful as an ingredient in cattle feed. Men in the same households suggest that maize is only used for feeding animals. Across household types, men indicate that maize is not a major source of food and therefore has less income generating potential than other crops. In contrast, many women stress that maize has big potential, because they benefit from the sale of *arekie*.

Maize farming in Bungoma and Laikipia provides a source of employment for both male and female labourers in different stages of the maize farming cycle. Interviewed male labourers, however, indicate that this employment does not provide sufficient income to meet all their needs even when they take up several assignments; they thus have to find supplementary income opportunities. In Hawassa, agricultural labourers are mostly taken on in the harvesting season, and labourers have to find alternative income opportunities at other times. Maize farming does not provide employment for labourers in Asella.

EXPERIENCES WITH MECHANIZATION

In the Ethiopian sites, human muscle constitutes the most important source of power in all phases of the maize farming cycle. When draught animal power is used, it is primarily for tillage and in some cases for transportation. The study did not come across any examples of tractor power being used in the sites in Ethiopia. Only three male interviewees in the Ethiopian sites have seen a two-wheel tractor, but many, if not all, male interviewees have heard about such machines. Of all female interviewees in Ethiopia, only one has ever heard about two-wheel tractors.

In Kenya, the experience with mechanization in maize farming differs between study sites and different HH types. In Bungoma, human muscle is the main source of power across the different HHs followed by draught animal power. There are however examples of MHHs hiring tractors (and the male agricultural labourers that come with the tractors); all hired tractors are from outside the county. In Laikipia, the use of two-wheel and four-wheel tractors is more common practice, primarily for land preparation and tilling, and sometimes for weeding. Here, tractors can relatively easily be hired from within the county, and one of the male heads of HHs included in this study owns a two-wheel tractor.

In Bungoma, some interviewees indicate that they have heard about two-wheel tractors and some, mostly men, have also seen these tractors. In comparison, most interviewees in Laikipia say that they have heard about or seen two-wheel tractors and some men have even used them.

Where two- and four-wheel tractors are used in Kenya, interviewees suggest that tractors are efficient and time saving and that they contribute to higher maize yields. Tractors are appreciated for their multifunctionality as the perception is that they can be used during different seasons and at different phases in the maize growing cycle including for land preparation, tilling, spraying, weeding, as well as transportation of farm inputs and outputs. This resonates with the findings of a study carried out by the FACASI project in 2013 in which multifunctionality of 2WTs and equipment comes out as an important principle for mechanization interventions (Misiko et al. 2013).

This study has not systematically assessed the impact of tractors, so we cannot claim the effects of tractors on productivity and family well-being. Yet, several respondents report positive perceptions, and these positive perceptions can stimulate demand for mechanization.

LAND OWNERSHIP

There are considerable differences between the sites and the countries in how land ownership is gendered and governed. In each site, access to and control over land is governed by plural legal systems; these include formal as well as customary law. In addition, norms and values also play into the actual access to and control over land that different household members have or can realize.

A dominant perception in the Ethiopia sites is that land belongs to men. In Hawassa, reference is made to the Sidama culture in which women cannot own land. All male and female respondents in MHHs speak of this. In FHHs, however, there are women - both heads of HHs and other women - who claim that they own the land they farm, but also share that this is contested by the family of the late husbands/fathers. In Asella, some of the interviewed women had land titles, but, despite these titles, the women insist that the land

belongs to their husbands.

In Kenya across sites and HH types, land is owned individually but different ethnic rules and beliefs affect how women can control and benefit from the land they farm. In the Bukusu community of Bungoma, land is owned by the male heads of HHs. If he has more wives, he allocates a separate plot for each to farm, the size of which is based on the wife's number of children, especially boys. Female heads of HHs can inherit land from their husbands if they have no sons, but they may face a lot of pressure from their in-laws to give up the land. Hence, having sons gives women in the Bukusu community security. If a widow has sons, she holds the land in custody until after succession after which she is allowed to live and farm on the land of the youngest son for as long as she lives. In the Kikuyu and Meru communities of Laikipia, women across HH types can acquire and own land either through purchase or inheritance from parents or husbands.

In conclusion - In the Kenyan sites and in Hawassa maize is a major crop and is considered very important in the livelihood of people across all types of HHs and HH members. In Asella, maize is grown at the homestead and women seem to appreciate maize and benefit more from the crop than men do. Tractors are not used in Ethiopia: neither in Asella, nor in Hawassa. In the Kenyan sites, tractors are used to a limited extent and more in Laikipia than in Bungoma. Across sites, women have less knowledge and experience with tractors than men. In Ethiopia, social norms constrain women's land ownership in Hawassa but allow it in Asella. In Bungoma land is owned by men but widows have rights to land, while in Laikipia women can inherit and own land.

Table 5: Characteristics of sites

	Hawassa	Asella	Bungoma	Laikipia
Land holding per household	- On average: 0.17 ha	- On average: 0.85 ha	- On average: 3 acres	- Between 2-20 acres
Importance of maize	- major subsistence and cash crop	- minor crop (homestead grown) - women in particular appreciate maize	- major subsistence and cash crop	- major subsistence and cash crop
Experience with mechanization	- no use of tractors	- no use of tractors	- limited use of 2W and 4W tractors	- some use of 2W and 4W tractors
Women's land ownership	- legally: both men and women own land - social norms: women cannot own land	- legally: both men and women own land - social norms: allow women to inherit and own land	- land is owned by men - widows can hold land in custody for sons	- women inherit and own land

4.2 - THE PROBLEM: LABOUR BURDEN AND LABOUR INTENSITY

GENDER DIVISION OF LABOUR IN MAIZE FARMING HOUSEHOLDS

In this section we present our findings concerning the gender division of labour with a focus on the variations between countries, sites and HH types. This sub-section includes findings related to different HH and farm tasks or categories of tasks. In addition to tillage and land preparation, it includes planting, weeding and harvesting; post-harvest processing and transport; marketing; and reproductive and household work.

But before these details, it is essential to recognize that women across sites and HH types report that they provide a significant part of the human labour in all stages of the maize farming cycle; FGDs held in Kenya even suggest that women provide most of the labour in maize farming. This could be linked with another

finding of the study, that men's involvement in agriculture is changing and declining. Whereas men used to play a major role agriculture - in all study sites women report that they are taking over agricultural tasks from men who are absent (in MHHs mostly the wife of the male head of the HH and in FHHs the female head). Absence, in this case, does not necessarily mean physically absent (such as in the case of a diseased husband/father, or husbands/sons living and working away from the farm), but also refers to men in MHHs leaving the responsibility to women who have to take it on.

Women, in particular in Hawassa, Bungoma and Laikipia talk about their experience of men disengaging from tillage and land preparation but also from providing labour to the HH and farm more generally. This is illustrated as follows by a woman from a MHH in Bungoma:

We call ourselves married women but practically when it comes to looking after the home and tending to animals and crops, we are just like single women or widows. These men are never in the home. They have their errands to run so every morning they leave the homesteads and hang around the shopping centers. My husband leaves the homestead very early on most days. I do not know what he does. I have to wake up early to make breakfast for him, tend to the animals and then go to the farm. I come back later in the early afternoon to take care of other household duties. I feel that I am just alone. My sons have started doing the same thing. It is hard to live like this. (Bungoma, FGD, women in MHH)

When answers to questions in our study about 'who is doing what' at times include 'male household members if they are not absent', then it is in reference to this experience of the disengagement of men.

Tillage and land preparation – There are notable differences between the sites on the gender division of labour with respect to tillage and land preparation (Table 6). In Ethiopia, tillage and land preparation is considered to be a man's task. That does not mean that women are not involved. In Asella, while men in MHHs and FHHWAMLs till the land by oxen, women collect and dispose of rocks and other unwanted materials. In the case of one FHHWOML, the female head of the HH has started to plough herself with support from her daughter. In Hawassa, most men insist that they are preparing the land, because it is culturally unacceptable for a woman to plough with oxen. Yet, three women from MHHs and two female household heads report that they are ploughing the land by themselves, because men are absent or disengaging.

In MHHs in Bungoma, land preparation and tillage are mainly performed with animal power and sometimes by tractors. If the oxen is owned by the male head of the HH, he will perform the work. Hired animals come along with labourers for ploughing and tractors with male drivers. In the absence of the male head land, preparation as well as the majority of other activities in the production phase are done by his wife, with the support of other women in the HH. Only in special cases, where the wife of the head of the HH is engaged in formal employment, these activities are performed by labourers. In Laikipia, men in MHHs prepare the land if they are not absent (using hired labourers, and animal or tractor power). In both Kenyan sites, in FHHWOML, land preparation is done by the female head of the HH unless there are resources to hire tractors and labourers. Also in FHHWAMLs, this is often the case, because male members are not always available as they also have to work as labourers outside the household.

Table 6: Gender division of labour – land preparation and tilling

	Hawassa	Asella	Bungoma	Laikipia
Land preparation and tillage	<ul style="list-style-type: none"> - according to social norms a man's task - women from five HHs report that they are ploughing because men are absent 	<ul style="list-style-type: none"> - according to social norms a man's task - one female head of a FHHWOML ploughs 	<p>In MHHs:</p> <ul style="list-style-type: none"> - male head of HH - wives with the help of other women, in HHs where male head is absent - to a small extent hired male labourers in MHHs <p>In FHHWAML:</p> <ul style="list-style-type: none"> - male HH members or female head of HH and other women <p>In FHHWOML:</p> <ul style="list-style-type: none"> - female head of HH and other women 	<p>In MMHs:</p> <ul style="list-style-type: none"> - male head of HH - in his absence: wives and other women - hired male labourers for hired animals and tractors in MHHs <p>In FHHs with resources:</p> <ul style="list-style-type: none"> - hired male labourers for hired animals and tractors <p>In FHHs:</p> <ul style="list-style-type: none"> - female head of HH and other women in FHHs

Table 7: Gender division of labour – planting, weeding and harvesting

	Hawassa	Asella	Bungoma	Laikipia
Planting	<p>In MHHs:</p> <ul style="list-style-type: none"> - male head of HH and wives <p>In FHHs:</p> <ul style="list-style-type: none"> - female head of HH 	<p>In MHHs:</p> <ul style="list-style-type: none"> - wives - male head of HH <p>In FHHs:</p> <ul style="list-style-type: none"> - female head of HH 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives and other women in MHHs <p>In FHHs:</p> <ul style="list-style-type: none"> - female head of HH and other women in FHHs 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives and other women - males sometimes help - hired female labourers <p>In FHHs:</p> <ul style="list-style-type: none"> - female head and other women - men in FHHs - hired female labourers
Weeding	<ul style="list-style-type: none"> - mainly women HH members 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives - all HH members are expected to contribute <p>During <i>wonfel</i>:</p> <ul style="list-style-type: none"> - women prepare and bring food to the pooled labour groups 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives and other women - men also participate - to a limited extent hired labourers (female) <p>In FHHs:</p> <ul style="list-style-type: none"> - female heads - other women and men 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives and other women - male head sometimes helps - hired female labourers <p>In FHHs:</p> <ul style="list-style-type: none"> - female head of HH - other women and men - hired female labourers
Harvesting	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly labourers - wives and other women <p>In FHHs:</p> <ul style="list-style-type: none"> - mainly labourers (when HH has resources) - all HH members are expected to contribute 	<ul style="list-style-type: none"> - all HH members are expected to contribute <p>During <i>wonfel</i>:</p> <ul style="list-style-type: none"> - women prepare and bring food to the pooled labour groups 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives - other women and men - to a limited extent hired labourers (F + M) <p>In FHHs:</p> <ul style="list-style-type: none"> - female head of HH - other men and women - women group /female friends and neighbors 	<p>In MHHs:</p> <ul style="list-style-type: none"> - mainly wives - other women and men - hired female and male labourers <p>In FHHs:</p> <ul style="list-style-type: none"> - mainly female head - other women and men - hired female labourers

Planting, weeding and harvesting - Across sites and HH types, women provide major labour contributions during planting, weeding and harvesting (Table 7). In MHHs in Laikipia, these tasks are mainly performed by the wife of the head of the HH, other women and men in the HH and agricultural labourers. In Bungoma, the work is shared among HH members with some support from agricultural labourers; but still with the bulk of the work being done by women. When labourers are employed for weeding, it is almost always women. In both Kenyan sites, in FHHs, all three tasks are done by the female head of the HH, daughter in-laws and girls and female neighbors available. In FHHWAMLs, the men sometimes assist.

In Hawassa, agricultural labourers are hired for harvesting in some MHHs and FHHWAMLs, but the FHHWOMLs cannot afford this and the whole family, including children, do the harvesting. Other tasks are mainly performed by women across HHs. In Asella, even when this weeding and harvesting work is done in labour groups (*wonfel*), women are expected to participate alongside the group with collecting and discharging the weeds from the field, transporting the stock or the crop on their own backs and preventing cattle from eating the produce. In addition, women prepare and bring food and drinks to the *wonfel* participants – sometimes several times a day.

Post-harvest processing and transport - In the post-harvest phase of the maize farming cycle, women across sites and HH types are performing shelling and grinding with limited input from men. In Laikipia, post-harvest management in MHHs is mainly performed by the wife of the male head, with support of other women. It happens that the male head hires a grain sheller and in this way assists with the shelling of the maize. In Bungoma, in the case that the wife of the HH is formally employed, agricultural labourers are hired for post-harvest work, but they will do the work in the week-ends when the wife can supervise them. In Kenya, when tractors are hired, they are used for transportation of farm inputs and products. In the Ethiopian sites, it seems that all HH members are involved in threshing, which in Asella implies that men spend days and nights in the field to protect the harvest from theft (including male heads of HHs and male members of FHHWAMLs). In Ethiopia across HH type, it is mainly women who transport the maize crop and stock after harvest. Women pick up the crop from the ground and put it in sacks and/or collect the stock, which has been cut by the men, and then transport the heavy bundles on their back. If men are involved in transporting crops and stock, animal carts are often used.

Table 8: Gender division of labour – postharvest processing and transport

	Hawassa	Asella	Bungoma	Laikipia
Shelling	- mainly women - but all HH members contribute	- mainly women - but all HH members contribute	In MHHs: - mainly wives - with the help of other women in HH In FHHs: - female head - other women in HH - female neighbors and friends	In MHHs: - mainly wives - with the help of other women in HH - male head, if sheller is available In FHHs: - female head - sometimes other women in HH
Grinding	- women HH members	- women HH members	- women HH members	- women HH members
Threshing	- all HH members contribute	- all HH members contribute During <i>wonfel</i> : - women prepare and bring food to the pooled labour groups	In MHHs: - mainly wives - with the help of other women in HH In FHHs: - female head - other women in HH - female neighbors and friends	In MHHs: - mainly wives - with the help of other women in HH - hired female labourers In FHHs: - female head - sometimes other women in HH

Table 9: Gender division of labour – marketing

	Hawassa	Asella	Bungoma	Laikipia
Marketing	In MHHs: - male head is responsible for bulk sale of maize - wives can sell up to 25 kg In FHHWAML: - sons In FHHWOML: - female head (with male accompaniment)	In MHHs: - maize is produce at homestead and wives can be responsible for sale In FHHs: - female heads	In MHHs: - responsibility of wives - income has to be handed over to male head of HH In FHHs: - female heads	In MHHs: - varies greatly, and can be: ■ male head of HH, ■ jointly, ■ women growing on own land market separately In FHHs: - female heads

Marketing - In Hawassa, men are responsible for the sale and marketing of the bulk of the maize. This includes male heads of HHs and, in FHHs, sometimes the sons (also those living away from the HH). In other FHHs, the female head is in charge of marketing, but if she sells in bulk she is often accompanied by a man (brother, uncle, neighbor) when she goes to the market. Wives in MHHs are however expected to generate income from smaller amounts of maize (not exceeding 25 kg provided to them from the male head of HH). In Asella, where maize is not a major cash crop, women can be in charge of its sale. In MHHs in Bungoma, marketing is the responsibility of the wife of the head of the HH, but she has to hand over the income from the sale to her husband. In Laikipia, marketing varies from one MHH to another: in some cases husband and wife do it jointly, in other cases it is done by the male head alone, while women growing maize on their own land in MHHs market their produce separately. In FHHs, the female head of the HH performs marketing and sale unless she is aged, in which case other women in the HH take over.

Reproductive and household work - Across sites and HH types, in addition to women's work-load in maize farming, women conduct all reproductive and household related activities: child-care and care for old family members, preparation of food and drinks, washing clothes and the collection of fuel, water, and fodder. In MHHs, the wife of the male head is responsible, but daughters-in-law and girl children contribute heavily to this work. Girls in MHHs are generally busy all the time compared to their brothers because girls, in addition to helping out in the field, have to support their mothers with all the household related tasks. Girls in FHHs often work more, because they have to compensate for their mother's absence at home when their mothers are busy in the field.

Table 10: Gender division of labour – reproductive and household work

	Hawassa	Asella	Bungoma	Laikipia
Reproductive and household work	- only women members of HH - girl children	- only women members of HH - girl children	- only women members of HH - girl children	- only women members of HH - girl children

In conclusion - In the Ethiopian sites, male household heads and male household members participate in farming, but hardly in household and other reproductive activities. In the Kenyan sites, male HH members occasionally participate in farming, predominantly in the tillage and land preparation stage, as the majority of the agricultural and household work is done by women (as household heads, wives, daughters or daughters-in-law). In all sites, women talk about their experience of men disengaging from providing labour agriculture.

WOMEN'S MOST LABOUR INTENSIVE TASKS

Reducing women's labour burden implies addressing the tasks or the combination of task that are the most labour intensive. Women's perception of the most labour intensive tasks vary to some degree between sites, HH types and different women. Figure 2 shows which task women as a group consider the most labour intensive in Bungoma and Laikipia, as well as in Ethiopia (same figure as there were few differences in the ranking). The ranking is presented in three groups of tasks: (1) production, (2) post-harvesting and (3) reproductive tasks. The ranking is done within a group of activities.

Bungoma - In Bungoma, across HH types, women consider tilling and land preparation the most burdensome, because they rely on human muscle power and most of the time there are no men available to do the work or assist the women. Across HHs, the daily chopping of fodder is reported to be a very labour intensive. Under reproductive activities, child care and food preparation are the most labour intensive, all daily, activities.

Laikipia - Turning to Laikipian women from MHHs and FHHWAML, weeding is considered the most labour intensive activity at the production stage, because this is where they rely fully on human muscle. Women from FHHWAML consider tillage the most labour intensive task. Similar to Bungoma, across HHs the daily chopping of fodder is reported to be a very labour intensive. According to the ranking exercise during the FGD, the seasonal/occasional shelling is the most labour intensive post-harvest activity. In terms of reproductive activities, child care and fetching water and fuel are considered the most labour intensive activities.

Hawassa and Asella - In the Ethiopian sites, women consider weeding and harvesting the most labor intensive production activities. Even women in Hawassa who plough, consider weeding and transportation of produce at the time of harvesting most labor intensive. A woman interviewee in Asella shares her experience with weeding:

It is very difficult to walk upright once you worked bending for a while, and it goes on the whole day maybe for days. Especially if you have a small child you often work either carrying the child on your back, or let the baby rest under a shed and you have to run up and down to attend the child and also work on the field.

During harvesting, it is the transport of the produce that women in the Ethiopian sites consider most labour intensive, because women have to carry it on their backs, while men often use an oxen cart. When it comes to processing, threshing is considered highly labor demanding and time consuming. The separation of the seed from the chaff is done manually and thus, depending on the wind, it may take days; moreover, this process irritates the eyes and makes breathing difficult. Also, women and girls across HH types say that grinding is highly labour intensive as they use a traditional hand-operated stone grinder. It also happens more frequently than threshing, and is on the top of the list of most labour intensive post-harvest activities.

From the long list of reproductive tasks, women point out that food and fodder processing as well as making local drinks (*arekie* and *tella*) with traditional equipment and using open fire are most burdensome. Preparing and bringing food and drinks to the participants of the *wonfel* is also considered a labour intensive task. Child care and washing clothes is said to be highly labour intensive in Asella particularly. Girl children in particular mention that fetching water twice a day is very labor intensive work, as well as processing *enset*.

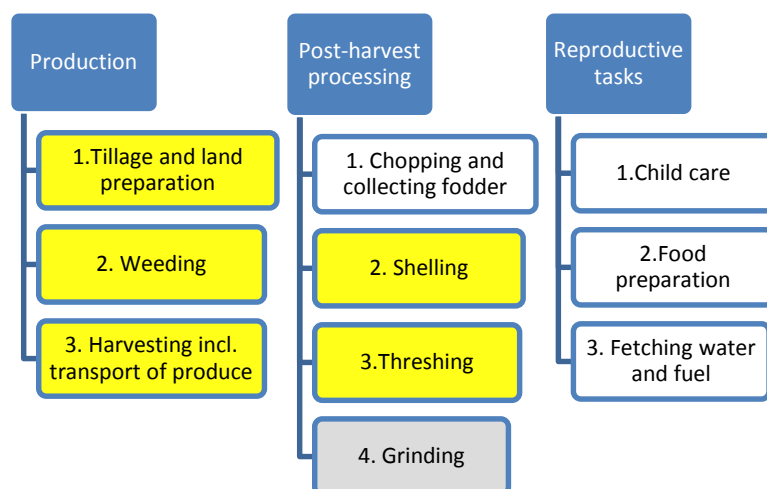
In conclusion - Across sites and HH there are a number of activities that most women seem to consider a high burden. The daily reproductive activities are considered highly labour intensive by most women. In the production phase of the farming cycle there is some variation in the ranking, but for all women it is either tillage or weeding that is on the top of the list. The transportation of produce in connection to harvesting is also found very hard by most women. In the post-harvest phase, the ranking depends on whether or not traditional hand tools are used or not. All tasks where women solely rely on their own muscle power (such as for weeding, fodder collection or transport of produce carried on their own backs) or hand-tools (as for threshing and grinding) are considered highly labour intensive by most women.

Figure 2: Ranking of activities that women consider most labour intensive

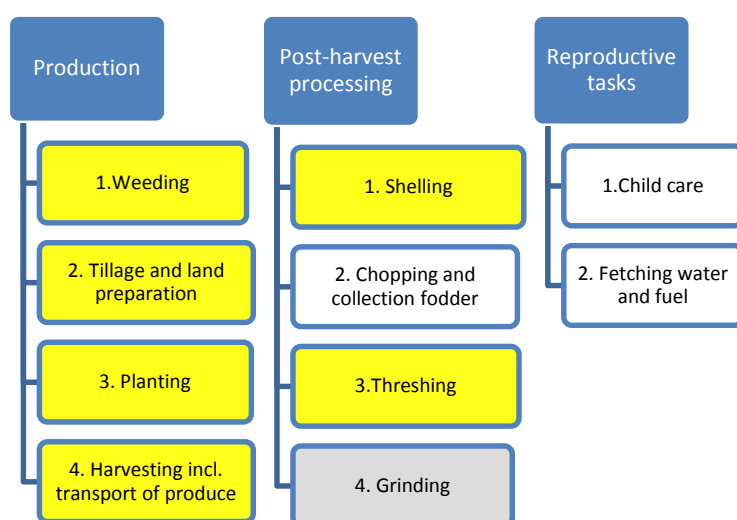
Legend

yellow = seasonal
grey = occasional/weekly
no fill = daily

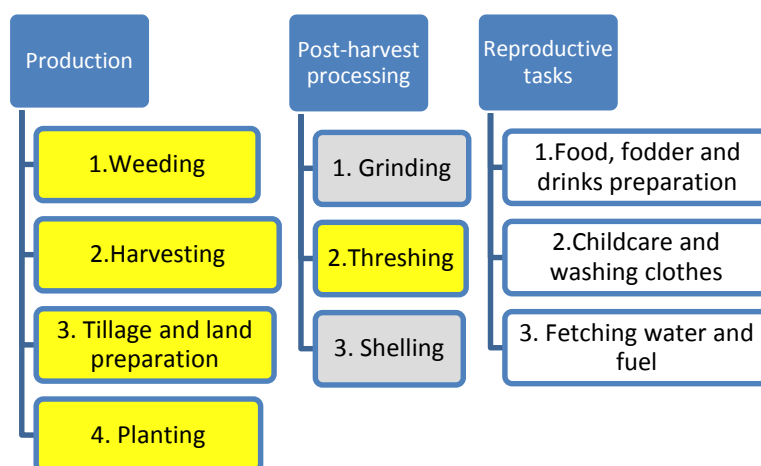
BUNGOMA



LAIKIPIA



HAWASSA & ASELLA



4.3 – OPTIONS TO REDUCE LABOUR INTENSITY

Different types of households pursue different options to reduce labour intensity. Table 11 shows these options vary not only for types of household, but also for the sites and the types of tasks. They also have varying implications for different members of the household, as we discuss in more detail in the next section.

Table 11: Options to reduce labour intensity by site

Options	Hawassa	Asella	Bungoma	Laikipia
Other HH members	<ul style="list-style-type: none"> - all HH members do farming - girls support HH work - large families: no shortage of labour 	<ul style="list-style-type: none"> - girl child helps in HH work and agriculture (planting, weeding, harvesting, threshing) - boy child: esp. in FHH 	<ul style="list-style-type: none"> - women (HH heads, wives or 'other women') do majority of work - male members in FHHWAML participate in tillage and land preparation 	<ul style="list-style-type: none"> - male HH heads or HH members occasionally assists women in farming - in FHHWAML: high labour burden for women HH heads and members.
Pooled labour		<ul style="list-style-type: none"> - 'wonfel' very common: weeding, harvesting, construction, etc. - men call for and participate; women prepare and bring food & drinks 	<ul style="list-style-type: none"> - only used by FHHWOML: is their only option to reduce labour - sometimes by wives of male HH heads. 	<ul style="list-style-type: none"> - sometimes used by FHHWOML, but not very common
Hired labour	<ul style="list-style-type: none"> - for harvesting (- not for ploughing; not for weeding) - no domestic helpers) - not in FHHWOML) 	<ul style="list-style-type: none"> - agricultural labourers for farming cycle - female domestic helpers in some MHHs and few FHHWOML 	<ul style="list-style-type: none"> - employed by MHHs - less employed by FHHs 	<ul style="list-style-type: none"> - male and female labourers (for tillage/ planting and weeding, respectively, and for harvesting)
Animals drafts (hired or owned)	<ul style="list-style-type: none"> - for ploughing 	<ul style="list-style-type: none"> - for ploughing 	<ul style="list-style-type: none"> - used by MHHs (ploughing) 	<ul style="list-style-type: none"> - used by MHHs and FHHs, depending on resources available. - commonly available
Tractors (2WT/4WT) (hired or owned)			<ul style="list-style-type: none"> - used by MHHs (ploughing) - used by MHHs wives with formal employment - used by FHHs, depending on resources 	<ul style="list-style-type: none"> - used by MHHs - used by wives in MHHs, who own land or have formal employment - used by FHHs

(light blue indicates less common)

Hired labour - Across the four sites, the two most common ways to reduce labour intensity in farming are hiring labour and use of animal drafts. Hired labour can be employed for specific tasks (e.g. harvesting in Hawassa, or planting or weeding in Laikipia) or for longer period (the farming season in Asella). The arrangements of hiring agricultural labourers vary per site and location. Whereas in Bungoma hired labour can be paid through either cash or on a work-for-maize basis, agricultural labourers in Laikipia can only be paid in

cash. In that region, availability of agricultural labourers is affected by the flower farming industry which attracts the labourers. In Asella, different arrangements are found for hiring agricultural labourers: households hire labourers for three months or a full year, and on top of the cash they pay, they provide food and often shelter. Another arrangement is for the HH and the labourers to agree on sharing the produce equally after deducting costs for inputs, in which case shelter is not provided. FHHWAMLs generally do not seem to employ labourers for maize farming with a few exceptions that employ female labourers for weeding. These female labourers also help with household work and of live in the HH.

It has been noted in the Asella study that women from FHHWOML face more challenges in handling labourers: they have difficulties negotiating a fair price, and need to monitor the work to be done, as they indicate that many male labourers 'face difficulties accepting orders from female employers'. Some FHHs have abandoned the idea of hiring labourers for these reasons. In all sites, it was observed that hired labour was employed more often by male than female headed households, with a few exceptions of the latter employing female labourers for weeding. In Hawassa, FHHWOML did not make use of hired labour. Another observation worth mentioning, is that in Laikipia, some women with formal employment in MHHs employ agricultural labourers for farming, including post-harvesting tasks.

In some sites, domestic helpers are hired to reduce the intensity of the household work. Differences can be noted within countries and sites: there is no mention of female domestic helpers in Hawassa, whereas they are employed in Asella – more commonly in MHHs and less frequently in FHHs, especially those without access to male labour.⁹ In some MHHs, these domestic helpers are paid by the household head, whereas in others, wives are expected to pay themselves from the small incomes they can generate from small sales (which is most of the time insufficient for household expenses, let alone for hiring a domestic helper). Domestic helpers are often young women, and their salaries are paid directly to their parents in their village of origin. In Laikipia district in Kenya, agricultural labourers can be both male and female, with the latter playing a significant role when employed for weeding stage of the farming cycle.

Animal drafts - In all sites, animal drafts are important to reduce labour intensity. They are mainly used for ploughing, tilling and at land preparation stages. Animals can either be owned by the household head, or can be hired. In Laikipia, the costs of hiring draft animals, including the fee for the labourer, are 2,800-3,000 KSh (\$31-33 USD) per acre of land; and in Bungoma the price is 3,000 KSh (\$33 USD). In both cases, male labourers work with the animals. In all four sites, the expenses of hiring animal drafts and labour weigh more heavily on FHHs, especially when they have less access to cash. In Bungoma, FHHs did not use animal drafts.

Tractors - When looking where and by whom tractors are used, the discrepancies between household types and household members becomes stronger, as are the differences between the sites. Tractors are not used in Ethiopia: neither in Asella, nor in Hawassa. In the Kenyan sites, tractors are used to a limited extent. In Bungoma, MHHs hire tractors on an irregular basis dependent on the availability of resources and assets that can be sold to cover the expense. The tractors are hired from neighbouring counties, and cost 3,600-4,000 KSh (\$39-44 USD) per acre of land, including the hired labourer. In Laikipia, tractors can be hired in the county and the neighbouring county. The price is 3,500 KSh per acre (\$38 USD). It was only in Laikipia that a farmer included in the study owned a 2WT (the male head of a HH) and where the farmer had the associated components for tilling, planting, weeding and shelling.

In both Laikipia and Bungoma, wives in MHHs as well as female heads of household could hire tractors; for the former, this was mainly possible when they had their own resources (e.g. through formal employment or land ownership). Female household heads in Kenyan sites could decide independently of their sons living outside the homestead on whether to hire tractors or pursue other options to deal with labour intensity. In all MHHs,

⁹ Asella is also a site in which migration of women to Arab countries to work as domestic helpers is common. Daughters are sent to work in Arab countries and send remittances home.

men pay for hiring tractors for the family farm. In both Kenyan sites, the tractors are predominantly used for ploughing, and only on exceptional basis in Laikipia for tasks as weeding, that are normally performed by women.

Pooled labour - It was only in Asella that pooled labour was an important way to reduce labour intensity. Reciprocal labour arrangements, called *wonfel*, are very common here. It is mainly men who participate in them, but women are expected to prepare food and drinks and take these to the fields. FHHs can call for and /or participate in *wonfel* by sending oxen or by contributing with food. In the other three sites, pooled labour was either absent (Hawassa), or hardly ever used. In Bungoma, it was only used by FHHWOML for planting, weeding and harvesting, as it was their only option to deal with labour intensity beyond the labour available in the household. It was also highly uncommon in Laikipia, except for a few cases of FHHWOML who had very constrained access to labour and relied on the goodwill and help from neighbours in peak-times.

Labour of household members - Another way to deal with high labour burden for agricultural and household tasks is to use the labour of different household members. The extent to which household members are involved in agricultural and household work depends on both the options available to the household as a whole, and the sex of the household member – as described in section 4.2. The less options a household has to access labour (either pooled or hired) or to hire animal drafts or tractors, the more that household relies on the labour of its household members. FHHWOML are hence most reliant on labour within the household, and in both Kenyan sites, they are the only household who exceptionally use pooled labour. In Hawassa, respondents stated that having large families allows for dealing with labour burden, and that there is little need to find other options for reducing labour intensity when there are many children in the household. This is also the site where families have little alternative income sources from farming (maize, soybean and *enset*), and hence have little options to reduce labour intensity.

Other important options - In Asella, fuel saving stoves are widely used which reduces women's labour burden significantly in the collection and preparation of the fuel wood – all except one FHHWOML have them installed. Also in Asella, in one MHH bio-gas is installed which speeds up food preparation and saves the time for the women in the HH. And a final way to reduce the labour burden is to ensure that different agricultural activities are performed effectively and timely. In Asella, women talked about the importance of preparing the land well before planting. They insisted that if ploughing is done well and in a timely way, it reduces women's labour burden significantly at the time of weeding. According to women in Asella this implies a high labour burden on the part of men and depends on their availability and willingness to plough the fields 4-5 times – or to invest in labourers that can do it.

In conclusion - Hiring labour and animal drafts are the most common ways to deal with labour intensity in farming in all sites, and these mainly apply to reducing labour in the land preparation phase of the farming cycle. Tractors are only used in Kenya, whereas using pooled labour is a way to reduce labour only in Asella. Few women can hire tractors – i.e. in MHHs it is primarily those with formal employment and/or land ownership that can independently decide on hiring labour, animals or tractors. FHHs have the least options and means to reduce labour intensity due to limited access to cash and financial resources. FHHWOML have the least options of all HHs, as they rely primarily on the labour of the members of the HH, with negative implications for young women and girls in particular.

WOMEN'S EXPERIENCES WITH ORGANIZING IN GROUPS

In the two study sites in Ethiopia, the number of women organized in community based groups and organizations is fairly low. Women interviewed suggest that membership in the local multi-purpose cooperatives serves a purpose only for those HH members who are responsible for requiring agricultural inputs and selling produce, which by and large is a male domain in the Ethiopian sites. In Asella, it is therefore

only the heads of FHHs without access to male labour that are cooperative members. In the case of FHHs with access to male labour, this membership is taken care of by the eldest son while none of the interviewed women in MHHs are members. Otherwise, women in Asella do not speak of being members of local women or savings groups. In Hawassa by contrast, women in all household types are members of local women groups organized under the church (*idir*) but none of them mention being in leadership positions. Also in Hawassa, two women (one from a FHH and one from a MHH) are members of local saving and credit associations, but both are currently inactive as they are not able to pay the required contribution. Of those women in the two sites that did participate in various local group or cooperative meetings, no one recalls that labour concerns were ever discussed, let alone how to access mechanized agricultural technologies. Across sites and household types, men and women question the relevance of organizing in cooperatives and community based groups such as the saving and credit associations, often citing experience with financial mismanagement and sometimes corruption concerns.

In contrast to Ethiopia, in the Kenyan sites there is a high level of women's membership in community based groups and organizations such as women groups, self-help groups (for example for widows) and farmer's organizations. In MHHs, the wives of the head of the household said that they are members and in some cases have leadership positions. Daughters-in-law appear to participate in the groups with their mothers-in-law. It seems that male heads of HHs rarely join farmer's organizations and that the level of men's membership in local organizations in general is low. In Laikipia, however, it is men who are involved with projects and organizations that work with small scale farmers such as FACASI.

Women across sites and HH types indicate that they have become members of local groups to bring development to their community, to find a space to talk about their concerns as women, and to support each other in taking care of their families. Several of the women groups are organized around micro-credit strategies such as 'table banking' and 'merry go rounds'. It appears that women members have occasionally obtained loans from the group to hire draught animals and agricultural labourers. However, according to women interviewed, it is not possible to access sufficient funds from the groups to hire mechanized equipment such as tractors. The impression is that addressing women's labour burden is not high on the agenda of the groups. Also, there is no indication that hiring or acquiring mechanized equipment as a group has been considered by the women members. To some extent this has to do with limited knowledge of accessing credit as a group. But some women also indicate that they would be afraid of taking loans as a group partly because they are concerned about group solidarity and management capacity. Moreover, because the income the women control as individuals is not stable and they would not necessarily be able to repay the loans, thus putting their limited assets at risk.

In conclusion - Across sites local organizations do not specifically address the high labour intensity of women. No examples were found of women accessing mechanized technologies through women groups or women purposefully organizing with accessing mechanized technology in mind.

4.4 – IMPLICATIONS OF WOMEN'S HIGH LABOUR BURDEN

Across sites it has been observed that hiring labour and animal drafts are the most common ways to deal with labour intensity, and similar to the case of using tractor, these mainly apply to reducing labour in the land preparation phase of the farming cycle. These options, in other words, do not address many of the tasks that women find most burdensome in the maize farming cycle nor do they address the labour intensity of women's reproductive responsibilities.

Across sites and HH types, the high labour intensity results in women being overworked and overburdened, with negative effects on their overall wellbeing and health in general, and their productivity and efficiency as

maize farmers in particular. Women often point out that it is the combination of having to do productive and reproductive tasks that makes their lives difficult. As a woman in Asella explains 'a woman may get to sleep for an hour or two' as she is pressed for time trying to finish her work in the household and the field. In the day-to-day life, men's absence on the one hand, and their expectations about women's multiple roles on the other is experienced as a burden, which a woman in Kenya express in strong words:

We work like donkeys, while men take rest and spend time out of the home. In addition, men still want to be taken care of like small boys. (FGD participant in Laikipia)

In general, reliance on the labour of household members seems to disproportionately affect women and girls. Women in FHHWOML appear to have the highest labour burden of all women and are therefore harder hit by these negative effects.

Almost all women consider reproductive work, in particular child care, highly labour intensive and often women with small children - including daughters-in-law - find it hard to make ends meet combining these tasks with productive tasks in agriculture. At peak moments in the maize farming cycle this becomes especially challenging, such as when women in Asella are expected to prepare and bring food for the reciprocal labour groups on top of their regular work.

For girl children, the implications of high labour intensity seem to be similar across sites and HH types. Young girls of school-going age are reported to face a number of challenges related to their schooling: poor school attendance and performance in exams, reduced time for home work and lack of enough sleep which in turn lowers concentration in the class room, and very little time for leisure /resting. The Asella report reads:

All girls ... interviewed in all household types ... expressed their dreams of becoming doctors, lawyers, actress, and the like, which they think is highly challenging to achieve because they are unable to concentrate on their studies, sleep less hours and are often tired at school (Asella field report, by Hailemariam, 2014, p.18).

In the Ethiopian sites, interviewees mentioned that girl children have had to drop out of school because of their high labour burden. Girls from FHHWOMLs seem to be most negatively affected, and in Hawassa, it appears that some girls have had to take over most of their mother's role in the household, while at the same assisting in farming and having to take food to the field where the mother works.

In general, across sites and HH types, if mothers are overburdened (for example when they have to take over tasks from men, in particular tilling and land preparation) and/or get sick, it falls on girl children to take over the mothers' work, especially the reproductive tasks. In FHHs with young men or boys, they are sometimes expected to provide the same labour contribution as a male heads in MHHs, which also can have negative consequences for their schooling.

Nonetheless, across sites, it seems that parents – mothers in particular – are increasingly focusing on their girls' education. In Laikipia, one of the women in a MHH speaks about this:

You see I have two daughters and one son in very good colleges and I am the one paying for their tuition from the sale of maize from my individually owned plots. I am investing in my daughters because I want them to be better off than me in their married life and be independent instead of relying on their husbands for everything because it can be very frustrating (Wife of Head of HH Interviewee).

In Asella, some mothers spoke about their efforts to protect their girls from too much work even if it meant more work for themselves, insisting that the girls should have time for homework and study. It appears that some mothers hope to give their girls a better future, with less hardship, through access to good education. This is recognized by their daughters as expressed in the Asella field report:

Two daughters in MHHs in both Kebele stressed that their mothers give special emphasis to their studies and therefore, have ample time to do their home works and study. They underlined that their mothers are overworked and tired all the time because the mothers insisted their daughters to do less at home and focus on their studies. However, both said that there is no excuse during weeding (school is closed at weeding time) and threshing time (which is during school time). (Asella field report, by Hailemariam, 2014, p.18).

5. GENDER DYNAMICS IN DEMAND ARTICULATION AND ADOPTION

Women and girls across sites and HH types provide most of the labour needed in the maize farming cycle as well as for all reproductive activities. However, that is not to say that the gender division of labour in maize growing HHs is static; on the contrary it is very dynamic as illustrated in chapter 4. Gender roles and responsibilities are affected among other factors by labour intensity, societal values that influence how HH members' labour is valued and recognized, individual aspirations of HH members, access to and control over resources, and social relations and decision-making. In this chapter, we analyze the factors that contribute to this lack of demand articulation and adoption. The four dimensions of our analytical framework will guide that investigation. We start with looking into the gender division of labour itself, then discuss values and assumptions that affect demand articulation and adoption. This will be followed by a discussion of gendered access to and control over resources, particularly extension services, land and income. The fourth dimension deals with intra-household decision-making.

5.1 – GENDER DIVISION OF LABOUR

In terms of the gender division of labour, the findings of the previous chapter would suggest that there is high demand of women for mechanized farm power. Chapter 4 has shown that, while there are differences between household types and different context, all women experience high labour intensity. For women and girls across sites and HHs, it is not only the distribution of tasks between male and female HH members that adds to their labour burden, also the high labour intensity of the tasks for which they are responsible. Yet, this high labour burden does not translate into a strong articulation of demand for tractors; neither by women themselves, nor by their male relatives. Chapter 4 has shown that FHHs have fewer options to reduce labour burden than MHHs. Especially FHHWOML face a high labour burden, but have few options to deal with that. Tractors are only used in the two Kenyan sites, and only by a number of MHHs, and in exceptional cases of married women with formal employment or own land. In addition, tractors are mainly hired for land preparation and tillage, and hardly for many of the tasks that contribute to women's labour burden. So, despite the high labour burden and intensity, there is no articulation of demand or adoption of tractor power for those tasks that affect women's labour burden, nor for the groups of women that face the highest labour burden. How to make sense of this paradox? And what additional factors play into women articulating demand for and adopting farm power mechanization? Before exploring the other three dimensions of the analytical framework, one aspect of the gender division of labour itself merits consideration: time poverty.

For women and girls across sites and HHs, women's total labour burden results in a 'chronic' condition of time poverty and exhaustion which in itself affects their demand articulation for and adoption of mechanization in several ways. Time poverty affects women's opportunities outside their house and farm for example in terms of acquiring new knowledge or benefitting from training and extension about agricultural practices including 2WTs and mechanization. As an example during the field-research in Laikipia, only one woman participant out of 30 was observed in a "Farmer's Field Day" organized with the purpose of informing and training farmers and service providers on how to use mechanization. Also it appears that less women than men across sites have heard about or seen 2WTs. Limited time also affects women's opportunities for building up social capital in the community and organizing around labour concerns which could make women's labour burden more visible. Of the few women in the Ethiopian sites that did participate in various local group or cooperative meetings, no one recalls that labour concerns were ever discussed let alone how to access mechanized agricultural technologies. With limited time, engaging in income generating activities becomes constrained, which otherwise could give women access to resources that could be invested in reducing their labour burden in agriculture. In Laikipia, young

women speak of their work burden preventing them from succeeding with small businesses. As such, time poverty and ill health are not only a manifestation of women's labour burden, but also affects women's opportunities outside their house and farm, for example in terms of acquiring new knowledge or information about agricultural practices, organizing around labour concerns, and/or engaging in income generating activities. Together all these effects further constrain women's opportunities to voice their labour concerns and exacerbate the invisibility and the lack of recognition of women's labour burden.

5.2 – VALUES AND ASSUMPTIONS

In this sub-section we discuss the implications of gender norms for women's articulation of demand for and adoption of mechanization. We will focus in particular on the extent to which women's labour is taken for granted, norms against women independently articulating their needs, and the assumption of 'the man is the farmer'. We will discuss how these norms and assumptions come together and undermine demand articulation by women; in that sense, they are a first key factor in explaining why the 'objective' labour burden of women does not translate into women articulating demand for mechanization.

WOMEN'S LABOUR TAKEN FOR GRANTED AND UNRECOGNIZED

Across sites there are strong norms and values about what a woman should do or not, and what is the ideal woman. One norm, that is present in all sites, is that women should do hard work non-stop. In Asella, this is illustrated by the local saying 'a woman and a sorter should never take rest'. In Bungoma it is referred to as 'doing what is normal for women' and in Laikipia as 'being a good wife'. In Laikipia, some women speak of taking on heavy labour burdens to live up to local gender norms, even when resources are available to invest in mechanized equipment. In Bungoma, women talk about a woman being considered a good wife if she does not employ other people to help her because that is a sign of laziness. Norms about women having to work hence undermine articulation of demand to reduce that labour burden.

A key factor explaining the low articulation of demand for reducing women's labour burden is the low recognition and value given to women's time and labour. In all sites, the work women perform is taken for granted, and most of the time not recognized. When asked about needs for reducing labour burden interviewees in different sites argue that women only play a supportive role in agriculture, while men do the more labour intensive tasks and men are therefore the ones whose labour needs to be reduced. In Hawassa, it seems that men and women alike consider women's roles and responsibilities insignificant - also in the MHHs where women have taken over the tillage and land preparation. Here, the argument is that men still supervise the women and this guidance is more important than the work itself. At the same time, women tend to belittle their work, as for instance this woman in a male headed household who says: 'the work is too little, [women] are never busy, the work is too small to need labor reducing options'. This lack of recognition of women's work is partly related to the lower visibility of women's work, and partly because the interconnectedness of reproductive and productive work is not acknowledged. The majority of postharvest management and reproductive tasks do not take place in the field or in the open but are confined to space in and around the home. Women's labour in the productive and reproductive spheres is often linked to social roles of women as mothers and wives, and women are expected to work in line with prevalent norms.

Labour being taken for granted is observed across sites, but there are variations in how it affects different women. Societal expectations of women to provide labour without much recognition start from a young age: girl children in Asella talk about being taken for granted as opposed to their brothers who have to work less hard and whom the sisters are even required to serve. Girl children in general work the most but are rewarded less or the

least – as is the case in the Ethiopian sites where boys are more likely than girls to go to school, especially when there is work that needs to be done. In Hawassa, across HHs the dominant sentiment is that there is no need to invest in girls, because they will be married and will eventually be serving another household. The category of daughter-in-laws, especially in Bungoma, also express their experience of being taken for granted and the many barriers their low status in the HH and community imply.

It is recognized across sites by many different HH members that HHs cannot function without women's labour, as illustrated by a quote from a women in Bungoma:

Women's labour is very valuable in the entire HH because without the presence of women households cannot function: there will be food insecurity and disorganization in the home; women take care of everyone in the HH. (Bungoma FGD participant 2014)

Paradoxically, the value of women's labour is in most sites and households invisible, taken for granted, and not translated into recognition. In the Kenyan sites, some men seem to appreciate that women are indispensable. Across HH types and by different household members in the Kenyan sites, concerns are expressed about women's high work-load and all interviewees feel that there is a need for reducing women's work burden. The motives are however different for men (male heads of HHs) and women. Some male heads of HHs in fact mention they feel neglected when their wives spend long hours working in the fields. Others worry about the effect of heavy work on their wives' health which might jeopardize their continued labour input into the farm and household. Women's motives are more varied – they talk about wanting to reduce their labour burden so that they can rest more, take better care of their HH duties, attend meetings outside the house, and engage in income generating activities. Turning to Ethiopia, a different picture emerges. In Asella, both men and women acknowledge that women are overburdened as illustrated by the quote of a woman who claims that she is so tired that she has 'difficulties lifting my hand at the end of the day'. But with the exception of one woman from a MHH, nobody expresses that there is any need to reduce women's labour burden.

An interesting point in this respect is the recognition of the labour burden of girl children. In Asella, Bungoma and Laikipia, it was observed that both men and women recognize that girls' labour burden compromises their education. The general pattern appears to be that the more work and the more labour intensive the tasks of grown-up women and heads of HHs are, the more the young women and girls are expected to work, which negatively effects girls schooling. In some cases, such as in MHHs and FHHs in Asella, women are consciously limiting or defying this pattern in HHs where mothers work harder to protect their daughters to ensure that they have time to study. The mothers do not want their girls to end up overburdened and without opportunities the way they did themselves – so the mothers work even harder to compensate for the labour input of the girls.

CHANGING ROLES, CHANGING NORMS?

Tillage and land preparation often used to be performed by men, however, in all study sites there are examples of women taking over ploughing from men who are absent. In Ethiopia, the trend is evident in Hawassa across HH types, while it is only happening in one FHH in Asella. In Kenya, the change occurs in both sites, though more in Laikipia, and concerns many MHHs and the majority of FHHs with or without male labour access. The many examples of men disengaging from agriculture mean that women's labour burden increases, but the changes do not immediately translate into an increase in women's interest in mechanization nor into the articulation of demand. This to a large extent has to do with societal norms about hard-working women that can defer women from adopting mechanization.

The changes do contribute to challenging stereotypes about what women can or cannot do such as in Ethiopia where a common belief is that "women cannot plough", and especially married women who plough are seen as dominant and *wondila* (meaning 'like a man' but with negative connotations). In Asella, the female head of a HH

without access to male labour, who has started ploughing, has experienced negative comments (especially from older people) but has also been encouraged. In Hawassa, where more women are beginning to plough, women speak about how a girl's ability to plough is becoming an asset when she gets married, which is an indication of a change in appreciation or attitude towards girls/women who do not match old stereotypes. In Laikipia, several women interviewed have taken part in ploughing competitions with draught animals. As such, the conversations with men and women farmers in the study sites reflect the gradual change of attitudes regarding women's labour roles.

Reported changes in the gender division of labour seem to be 'one-sided', i.e. when men hand over work to women they do not necessarily take over some of women's tasks in return such as reproductive tasks, as also noted by women across sites. Gender norms are at play around reproductive tasks affecting the likelihood of men taking on these tasks, as for example in the case of Asella where women report that if men are asked to help with household tasks they will respond 'do you think I am a woman?'. There are some examples of men taking over work that is usually done by women in the post-harvest management phase of the maize cycle, but it seems to happen mostly in combination with the use of animal power (such as in the case of men in Hawassa where men use oxen cart for transportation) or mechanized tools (such as in the case of Laikipia where men in a MHH participate in maize shelling because a machine had been hired). Unlike women, men then are able to articulate demand for mechanization when taking over these tasks. While men's support could reduce women's labour burden, it could also affect women's ability to control a particular phase or task in the farming cycle which could be a disincentive for women for adoption of mechanized equipment.

NORMS ABOUT VOICING CONCERNS AND INDEPENDENCE

The articulation of demand is further undermined by norms that limit women's space to articulate their own demands. These include on the one hand norms that women should not complain, and on the other hand, norms that women are to depend on men. In the Ethiopian sites, women explain that society favors women who never whine and never speak out loud. Here it is not socially acceptable for a woman to complain about her work-burden, which in Hawassa - as mentioned earlier - seems to be so strongly engrained in women that they belittle their own work. This is exemplified by a woman from a MHH in Asella who expresses concern that if she would use machines in her work, she would be labelled as a woman that 'managed to have time to be idle' by society. In the same site, two wives in MHHs in Asella, who claimed that labour saving technologies could reduce their labour burden, were reluctant to raise this with their husbands, afraid that they would consider them 'lazy'. These values make that women's labour burden is not a subject that easily gets raised or discussed. Not at the household level, but also not in other spaces. This silencing of women's realities and concerns in itself contributes to the general idea that women are not in need of labour saving measures, and further undermines demand articulation for mechanization.

A less explicit, but nevertheless influential norm appears to support that women, in particular in households with male heads or in some cases male adult sons, must be dependent on men. Across sites gender norms manifest themselves in negative attitudes to women owning land, assets and controlling money. A male head of a HH in Asella argues:

However knowledgably a woman may be, her idea will not be realized without the consent and action from the man.

This expectation that women should be dependent on men becomes most visible in those instances where it is challenged, for instance when women access tractor power and their husbands oppose that. In all four sites, resistance is voiced or reported of men and in-laws against women and daughters inheriting land. In Hawassa for instance, women who own land after the death of their husband, face pressure from in-laws to give up the land. In

Bungoma, widows inherit land directly in case the marriage has not brought sons; in some cases, but not always, there is opposition from the in-laws to the land being owned by the woman, and she is encouraged or pushed to return to her parental home.

Laikipia is the only site where it was indicated that in some families there is little hostility towards daughters inheriting land from their deceased father. However, in both Kenyan sites, we see male household heads who do not want their wives to succeed as farmers, and prevent women from hiring tractors from their own money. A male household head in Bungoma argues:

How can a woman hire tractors? What does she want to show? I am the head of the household and no-matter how much money she earns; it's nothing and I cannot allow her to invest in big projects that will bring in more money to her pockets. I do not know what will happen, she might decide to abandon me and not to listen to me. A woman's place is in the kitchen and in the home even if she is working. No-matter what it takes, women should always be reminded so that they do not cross the line and try to do what men can do.

Women who defy gender norms experience resistance, repercussions and stigmatization within their household and families, as well as in the community. A woman from a MHH in Asella who is taking joint decisions with her husband says that other husbands are considering her as bad influence and they do not want their wives to be associated with her. In Hawassa, women talk about instances where wives were asked for divorce because they complained too much about their work.

The combined effect of norms that women should not complain and should depend on their male relatives, constrains women to independently articulate demand to reduce their labour burden. Gender norms related to how women have to perform appear to be a hindrance for women to raise or discuss their labour burden. The result is that their labour and their burden continues to be invisible and unrecognized, and it feeds the perception that women are not in need of labour saving measures with negative effects on demand articulation for mechanization. Defying gender norms appear to have negative implications for women, however there are also examples of women who find ways to challenge stereotypes and a gradual change of attitudes regarding women's labour roles are reflected in the conversations with men and women farmers in the study sites.

ASSUMPTION OF 'THE MAN AS THE FARMER'

Across sites, men are considered to be the main farmers in MHHs. This manifests itself in different ways. In Asella, with the exception of members of one MHH, women are perceived as having a supportive role in agriculture irrespective of how much agricultural work they do. In Hawassa, it is assumed that women lack technical knowledge to make the right decisions in agriculture and male heads of HHs stress the need to supervise the women who have taken on ploughing and underline that their guidance is more valuable than the actual work of the women. Interestingly, recognition of who does what work is not only, or not so much based on who does the actual work, but also on the assumption that men are farmers and women are not. Here an important observation to make is that the social recognition of labour roles has not kept pace with the changes in the gender division of labour. Men's traditional role in agriculture - tillage and land preparation - translates into men's labour being more recognized than women's; this perception of value persists whether men continue to be responsible for the work or not.

The assumption that 'the man is the farmer' affects demand articulation and adoption in different ways. Firstly, by making their farming work invisible, and by denying the link between productive and reproductive work. Secondly, the assumption is also prevalent and influential at the level of organizations offering services to farmers. Women's views are not sufficiently informing agricultural service providers and other stakeholders that develop and deliver technologies. As a general pattern, men across sites and HH types, and irrespective of

whether they are working as farmers, have obtained more knowledge about mechanization than women have because they have been more in contact with service providers and organizations that work with small scale farmers. Women are not involved in trainings which mean that the provision of knowledge to men further supports the assumption that men are the farmers, and actually reproduces their privileged control over knowledge and resources.

5.3 - ACCESS TO AND CONTROL OVER RESOURCES

The general pattern is that men control most assets in the households in which they are present. This counts for most of the MHHs in all four sites; it also applies to many of the FHHWAML. There are differences between the sites on gendered access to and control over resources. Interestingly, these variations - in the level of access to and control over resources that some women can realize - have been observed within the same site, and both between and within different household types. In this sub-section, the dynamics are presented for different types of households, and the implications for the articulation of demand for and adoption of mechanization are discussed. Particular attention is paid to changing relations, to variations between sites and household types as well as within household types, and to ways in which women realize access to and control over resources. We discuss three types of resources: we briefly touch upon (1) extension services, information and credit, and then continue with a detailed consideration of (2) land and (3) income from farming.

We observed earlier that women were less informed about 2WTs than men. In addition, only one woman was observed as participating in the 'Farmer's Field Day' that took place during the field work. Women also report to have little access to credit, and to extension services in general. This is partly due to the bias of service providers (the 'man as the farmer' assumption). Women's time poverty also constrains their ability to move out of the home and away from their work. In chapter 4, we noted how that affects their possibilities to attend groups, engage in business, access information and build networks. That means that time poverty constrains women's access to a wide range of key resources. As we will discuss in more detail below, women control mostly small amounts of money and only in a few cases are owners of land and assets; as a result, women face challenges in accessing credit, as is reported in both Kenyan sites. Indeed, women access table banking and merry-go-rounds in order to control, accumulate and access money and capital.

LAND AND INCOME

Male headed households - In MHHs, most assets are owned and controlled by men. This includes land as well as the animals, crops, trees (e.g. eucalyptus in Asella, and coffee plants in Hawassa), tools and furniture. In both Ethiopian sites, land is perceived as belonging to the man; in MHHs, all land is perceived to be owned by the male household head. There is one wife of a MHH in the Asella site who claims that the land belongs to the household, and that she jointly owns it with her husband. In the Bungoma site, men in MHHs own the land. Male household heads in Laikipia own land; yet, wives in MHHs, and also daughters and daughters-in-law do own land independently. This land has been acquired through inheriting from parents or deceased husbands, or women purchasing land from their own resources.

Male ownership over the land is translated in all MHHs in all sites into male control over the fruits derived from the land, that is the harvest and the income generated from sale of the crops. In several cases, women do not even know how much income is generated. In Hawassa, women in MHHs that own eucalyptus trees or coffee plants do not know how many plants or trees are owned by the household, or what income is derived from it. In MHHs in the Kenyan sites, there are differences in the level of control men exercise over marketing and incomes; especially in Laikipia, it has been observed that in some households income is controlled solely by men, whereas

in others it is more joint. In none of the sites, household level assets and income are controlled by women only.

In most MHHs, women generate a small income. This primarily is generated from the small amounts of harvested crops that the household head allocates to the wives for household consumption and expenses. The harvest allocated to household consumption is then controlled by the wives. In addition, wives of male household heads can sell small amount of *enset* (Hawassa), *arekie* and other local alcoholic drinks (Asella), vegetables, eggs and chickens, dairy products (both Hawassa and Asella). This income is to be spent on household needs, including oil, salt, sugar, soap, as well as school related needs of the children.

In most cases, the income women generate in these ways is small and insufficient to meet household needs. One woman in the FGD in Asella illustrates this when stating:

The income from the sale of these products is so small compared to what is gained from the main agricultural products and therefore it is always a struggle to make ends meet.

In both Ethiopian sites, women in MHHs cope with these challenges by taking some amount of the harvest before it is sold by the household head. Either during harvesting or threshing, women seize the opportunity to set aside small parts of the harvest, without their husband's knowledge. These small amounts are sold secretly to complement their limited resources and meet household needs. A similar strategy of secretly selling maize or other crops allocated for household consumption is employed by women in Bungoma.

In a few households in the Kenyan sites, women owned land or controlled income they earned from formal employment. These women had direct access to and full control over key resources. In Laikipia, women who own land, have full responsibility and authority over their farms. We will discuss below how this fundamentally changed their ability to deal with the labour burden in farming and the household.

Female headed households – The different FHHs in the four sites vary considerably as to the resources that women can access and control. These variations manifest themselves between the two types of FHHs, as well as between same types of FHHs in the same site. In those households which are not headed by men, but in which male relatives are present, the access to and control over both land and income is arranged in different ways. A key asset is ownership over land, and control over land is governed by formal and informal rules of inheritance, as well as social norms in the community. In Laikipia, women own land after the death of their husbands (and can, as mentioned above, also acquire land by purchasing or inheriting it from their parents). If a couple has no sons, the wife inherits all property when the husband dies, and when she passes away, the land is inherited by the daughters.¹⁰ The actual control over the land is further governed by social norms and relations, and this explains why women in similar household types have different levels of access to and control over land. Informal rules and social norms for instance explain the difference in control over land between the two Ethiopian sites. In Ethiopia, legally land is registered and owned by both the male and the female head of the HH. In Hawassa, however, the social norm is that women cannot own land, whereas in Asella social norms allow women to inherit land from their deceased husband, and some women actually have land titles.

In some of the FHHs in Ethiopia, the land is owned by the sons of the female head; the woman can farm on the land, but it is owned by the son. In those cases, women have access to land, but do not control the income derived from farming, which is also controlled by the son. This situation is found with both FHHWAML and FHHWOML in Asella and Hawassa. For those FHHWOML, the land and income derived from it is controlled by sons who live at a distance in the cities; that is, these are cases of 'remote control' by sons not actually living in the village and household, but having control over key assets and resources in the household. We come back to this when

¹⁰ In Bungoma, a common practice was that the brother to the husband inherits the wife in case the husband passes away. In such cases of wife inheritance, the brother-in-law lives with her as if she is his wife, and controls the household assets and income. This practice is said to be dying out gradually, and no cases of inherited widows were observed in the Bungoma site during the field work.

discussing decision-making dynamics below. In neither of the Kenya sites have we observed such a pattern of land and income of FHH being under 'remote control' by sons living in the cities. In fact, the women heading the FHHs in Laikipia and Bungoma, control the income derived from the farming. These female household heads occasionally consult their sons living elsewhere, but the women also indicate that the overall decision lies with the woman.

In some of the FHHWOML in the two Ethiopian sites, women own the land themselves. Women have access to and control the land, as there are no sons to inherit from their deceased husbands. Yet, earlier discussed values against women independently owning property come into play here. For those women who control land, then, this often comes with a price in terms of social acceptance and strength of family ties. In several cases, women in FHHs had to cut the ties with their sons to be able to control the land. The variations in women's control over land in FHHs, as well as the social disapproval accompanying it, indicate that ownership can be interpreted in various ways, is subject to contestation, but is also changing. Another important observation to make is that the land that women own or access is very often inherited; in the inheritance process, land is divided among the sons and this implies that widows in FHHs in the majority of cases own or access smaller plots of land than their deceased husband. Put differently, the amount of resources FHHs can access or control is smaller than that of MHHs.

The differences in control over land affect women's control over income. When land is owned by sons, they also control the income generated from it; this has been observed in households where sons participate in the actual farming as well as in households where the female heads provide all labour for farming. In cases where women control land, they also have more control over the income. Female heads of HHs in Laikipia do the marketing themselves, and wives in MHHs who own their own land, also farm independently and sell their crops themselves. One woman in a FHHWOML in Asella owns the trees of the household, and also sells them and negotiates the price herself. Being an exception, she has to make an effort to get the right information to do the marketing:

I look for information from different people, the market and listen to the radio or other sources as to how much is the current price before I decide to bring any product to the market. (female household head, interview, Asella)

Land ownership for women in FHHWOML does not automatically translate into control over produce and income though; one of the FHHWOML in Hawassa reported that she relied heavily on agricultural labourers to be able to farm her land, and that those labourers had a large say in deciding what was being planted and how the harvest was divided and used.

EFFECT ON DEMAND ARTICULATION AND ADOPTION OF LABOUR SAVING OPTIONS

Tractors are only hired in the Kenyan sites, and in vast majority of cases by MHHs. Male heads of household in Bungoma often rely on the sale of assets to pay for the tractor hiring, or draw from income from formal employment to cover the expenses, as the following quote from a male household illustrates:

In the past when I was much younger and had a formal government job (Bungoma town mayor), I hired a tractor for different activities in the maize farming cycle. Those were the days when I could boast of a good harvest: my family had enough to eat, sell and my wives were happy and well taken care of since they did not have to do manual work all the time. I was the envy of many in the village. I am now a retired government employee. My pension is not that much, yet I have three wives to take care of.

And some of the children from my youngest wife still go to school and I have to raise the tuition especially for university education. There are times that I cannot hire a tractor or even animals to help with the work. When that happens, I do not harvest enough maize even to feed my big family leave alone to sell. My youngest wife spends long hours in the fields working. She gets very tired and I also need more care and attention because I am not young anymore. (male head of household, interview Bungoma 2014)

In Laikipia, it is the male household heads who hire the tractors, and are also the ones paying when hiring is for the household fields. Laikipia is also the site where wives of MHHs hire tractors themselves, that is, when they are also the ones owning the land. It is the control over resources that allows them to do so. Similarly, women in Bungoma who control resources and income, for instance through formal employment, occasionally hire tractors for their own fields. Whereas women with independent resources in MHHs in both Kenyan sites more or less frequently hire tractors themselves, FHHs lack the resources and purchasing power to hire, let alone buy tractors.

The arrangements through which women themselves can access and/or control resources are very different in the different types of HHs. As a result, the extent to which women can articulate demand for mechanization and adopt labour savings options also varies. In MHHs, women control little assets, and this limits their ability to articulate demand for mechanization or other ways to reduce labour intensity. The few resources women control do not enable them to independently adopt relatively expensive options (see section 4.3 for an indication of prices of hiring animals and tractors in Kenya). The examples of wives in two MHHs in Asella who paid the (very low) salaries of domestic helpers from their own small incomes, underline that control over resources can positively affect demand articulation and adoption. Yet, they also point out that the amount of resources of women is very limited resulting in having fewer options to pursue on their own means; they could not afford other, more costly, options, and wives in other MHHs do not have enough money to pay for domestic helpers. As we will discuss in more detail in the decision-making part, women's limited control over resources affect their ability to make independent decisions, and also affects their influence in shared decision-making in the household.

In some FHHs, the control of women over resources is similar to that of wives of male household heads, with the difference that in those FHHs, resources are controlled by sons, either living in the household or at a distance. The amount of resources these women control can be further constrained, compared to MHHs, because the assets of the deceased husband have been divided among the heirs. In other FHHs, women do control assets and income, but again, the amount of resources is very low, and this undermines their ability to opt for more costly options such as the use of tractors. The death of a husband seriously affects the resource base and income of households and widows often find themselves with more limited resources, and hence lost options to reduce labour burden, as illustrated by the following woman heading a FHH in Bungoma:

When my husband lived, he hired tractor and animal drafts to till the land and prepare it for planting, weed and transport farm inputs and outputs. I did not have to do these activities on my own. Now that he has passed on, I use human labour for most of the activities during the maize farming cycle. Those days were good because productivity from our farm was high; we had enough food for the family and could even have a surplus to sell. I had more time to attend to household duties and even rest. A lot changed after my husband passed on: I have more struggles and barely rest yet productivity from my farm has gone down. My only helpers are my children, friends, neighbours and women group members but still life is not the same at all. (female head of household, interview Bungoma 2014)

In both Asella, Hawassa as well as Bungoma, FHHWOML actually lack sufficient resources to hire agricultural labourers. Affordability of tractors is therefore a major concern for women in FHHs. Moreover, these women who are challenging conventional norms on male ownership over land might lack social capital of sons, relatives and community members to support them in difficult times.

5.4 – INTRA-HOUSEHOLD DECISION-MAKING

Within households, a range of decisions are being made, about what crop will be planted where and how, what inputs will be purchased, which parts of the harvest are sold and which parts are kept for household consumption. Decisions are also made on who is to provide what labour at what stage of the farming cycle, and on how the income derived from the sale of crops is used. Obviously, the dynamics around who takes

these decisions, and who else in the household is involved in what capacity, vary greatly between male and female headed households. The largest part of this section unpacks decision-making processes in MHHs; towards the end some issues in FHHs will also be discussed.

DECISION-MAKING DYNAMICS IN MALE-HEADED HOUSEHOLDS

In MHHs, the general pattern is that men are the ultimate decision-makers in the household. They are the ones to decide on the allocation of labour, on what part of the harvest is sold and what allocated to HH consumption, and also on how it will be used and what expenses will be made. This counts for all MHHs in the two Ethiopian sites; both women and men in both sites state that men are the main decision-makers in the household. This is strongly related to the expectation that women have to depend on men, discussed earlier. Interestingly, women are the ones who actually keep the money in the household. One male FGD participant in Asella claimed that ‘women are good in keeping the money’. Wives and husbands in both Ethiopian sites confirmed this; they also explained that women cannot use any of it. ‘Touching his money’ is considered a cultural offense.

The two Ethiopian sites differ in the level to which women in MHHs are involved in decision-making. In Hawassa, none of the four women in MHHs interviewed was consulted on household expenses and decisions made by the male head. In Asella, by contrast, all FGD participants and three of the four wives in MHHs said that men involve them in decisions on expenditures. Yet, as the field report reads:

Ensuing discussion revealed that their involvement is more of *being informed* on his decision than discussion regarding what the priorities are and what has to be bought or sold for what purpose. All women involved in this research, including the two who claim to make decisions, admitted that even when they touched that money for fulfilling the family needs, they often return back before the husband finds out. [...] After a heated discussion during the FGD, women insisted that it is very hard to say that they are deciding on anything due to among others high dependence for income on the men. They also argue that, culturally, major decisions are for men. (Asella field report, by Hailemariam, 2014, p. 25; emphasis ours)

In the same site, one woman from a MHH and one in a FFHWOML indicated that they are making and participating in decisions. But this is also the woman to which we referred earlier, with whom other men do not want their wives to associate with.

The patterns of decision-making in MHH are more varied in the Kenyan sites, and this is most visible in Laikipia. One variation is when wives own land or have formal employment; this will be discussed in more detail below. The other variation is that in some MHHs, decision-making is done jointly by husband and wife, whereas in others, decision-making remains the exclusive domain of the male household head. This means that there is no universal pattern within this household type in the Kenyan sites. The Laikipia report reads:

Women’s views are rarely taken into consideration since most wives do not earn an income of their own and depend on their spouses for support. In other MHH, there is joint decision making on allocation of resources. (Laikipia field report, Mukewa, 2014: p. 27-28)

Joint decision-making is not equivalent with equal voice in decisions; the report continues that in the MHH with joint decision-making ‘still major decisions on resources are made by the male heads of households’. This is a consistent interpretation across the four sites, when husbands or wives speak about joint decision making, this often means being informed, or sometimes being consulted. The women and men who claim shared and equal decision-making are rare. The male dominance in decision-making is well illustrated by the explanation of a male household head in Bungoma who explains why he holds the household’s bank accounts:

How can my wife operate bank accounts? I am the sole owner of all bank accounts. If she needs money for anything she should ask and it is I who determines whether it is a worthy need or not. It is my money, so I control it. If a woman has a bank account then she will be big headed. (Bungoma Male Head of Household 2014)

This quote not only points out where the decision-making authority in the household lies, but how that is related to the husband's ownership and control of key assets in the household. The quote also points to negative conceptions around women having a say or power in decision-making, to which we pointed earlier.

Male dominated decision-making does not by definition mean that women's interests, and especially their labour burden, are not recognized by their husbands. In Bungoma, the decisions of some male household heads responded to women's need to reduce their labour burden; some women also discussed their needs with their husband, and tried to negotiate a positive response. In other MHHs, this was not considered a factor in household decisions. In fact, the FGD, key informant interviews and individual HH interviews in Bungoma indicated that in most MHHs, decisions were not taken in favour of reducing women's labour burden. A similar picture emerges for the three other sites. In Asella, one husband in a MHH allowed his wife to hire a domestic helper, but did not want to invest in this, and insisted that she had to pay for it herself. In Hawassa, women in MHHs face difficulties pursuing options to reduce their labour burden, given the low level of resources they control and the low level of involvement and power they have in decision-making processes. Women's weak bargaining position, combined with norms against women that 'complain', can even prevent them from bringing up their concerns.

It is important, however, to see the positive deviances from this general pattern. In Laikipia, a few MHHs occasionally hire tractors for weeding, a task that is normally carried out by women. In Asella, the husband in one of the MHH had brought bio-gas into the household; his wife explains that he understands her issues and had decided to invest in biogas to reduce her labour burden. The direct benefit for the wife is that it speeds up food preparation and saves her time. Moreover, women are taking initiative to raise their concerns with their husband, for instance two women in FHHWAML and one in a MHH in Asella are proposing to install fuel saving stoves, and two wives in MHHs in the same site had raised their labour needs with their husbands. And the earlier mentioned wife who claims shared decision-making in the household. The significance of these positively deviating cases is that they imply that gender relations are dynamic, and that there are tendencies towards more equitable gender relations in MHHs.

The big shift occurs for women who own their own resources, either through formal employment or when owning land. Independent control over resources is a game changer in decision-making, because it allows women to make their independent decisions. One woman in a MHH in Laikipia explains:

I bought my own piece of land and I plant maize on my own land, though my husband and I also have joint plots under maize. I make my own decisions on whether to hire tractors or not. This season I sold some of my goats and one cow and had enough money for hiring a tractor and animal drafts to reduce my labour burden. This way I can concentrate on my dairy cattle because they give me a good income. My husband cannot question my decisions because he knows once I get the money after selling maize,

I use some for household needs, buy more assets for myself and also I have a separate savings account. You see I have two daughters and one son in very good colleges and I am the one paying for their tuition from the sale of maize from my individually owned plots. I am investing in my daughters, because I want them to be better off than me in their married life and be independent instead of relying on their husbands for everything because it can be very frustrating. (Laikipia Wife of Head of HH Interviewee (Kikuyu), 2014)

Women's independent ownership of land or income from formal employment gives them direct control and decision-making authority on those resources. It also affects their bargaining power vis-a-vis the resources

controlled by their husbands, and the decision taken in the household. Direct ownership is a game changer, because it is the only way in all four sites and across all household types, through which women could independently make decisions, and indeed, articulate demand for mechanization and actually hire tractors.

The acknowledgement that households are not harmonious units also requires an exploration of instances of tensions or conflicts in intra-household decision-making. The interviews in the four sites suggest that diverging interests as well as differences in bargaining power can contribute to tensions or conflicts in intra-household decision-making. Wives of MHHs in Laikipia had experienced conflicts with their husbands about whether or not to reduce women's labour burden. Husbands were reported to not recognizing or not being willing to hire tractors, but rather preferred to use financial resources to buying shares in the local cooperative. In some of the cases, changes in control of women over resources, were accompanied by increased tensions in household. In both Laikipia and Bungoma, wives in MHHs report on husbands being hostile, putting women down, or obstructing their efforts to hire tractors. This tie in with norms against women's independence, to which we pointed earlier. A male household head in Laikipia argues:

Our wives can be big headed especially when they have money under their control. That is why we do not allow them so much autonomy in decision making on income and sell of produce. For instance, in my household, I sell all the maize and then decide how the money should be used. If my wife needs to buy something, she informs me, then I give her the money that she needs as long as it is reasonable to buy that item. (Laikipia Male Head of household interviewee (Meru), 2014)

In both sites, reference is made to men intimidating their wives in order to maintain their control. In Bungoma, women sometimes temporarily abandon their marital homes when tensions become too high. In Laikipia, one of the women in a MHH also speaks of physical abuse:

I inherited land from my parents before marriage and over time, I have been growing maize on my own here in addition to joint maize farming on the piece of land that my husband owns. I have my own bank account and have also bought some dairy cattle, goats and sheep. Instead of my husband appreciating that I am helping with the family responsibilities, he sometimes treats me with hostility and physically abuses me. I have reported him to the local administration. I take courage because I have my own money and assets. I do not understand why he feels this way and I pay tuition for my two daughters who are in colleges. It is not like he did not know about this land because I inherited it before marriage. (Wife of Head of Household, Laikipia Household Interviews, 2014)

She speaks of her husband trying to oppose her from using tractors on the land she owns and farms. For some men, women's financial empowerment is experienced as a threat, and they seem to be afraid that women's control over income will undermine their position as household heads.

DECISION-MAKING DYNAMICS IN FEMALE-HEADED HOUSEHOLDS

The gender dynamics in female headed households are also not universal. The major difference concerns the decision-making authority male relatives, especially sons, have in those households. This counts for FHHs with males living inside the household itself, as well as for those where there are no males living in the household. In both cases, sons living in cities can be key players in household decision-making. As pointed out earlier, there are major differences between Kenya and Ethiopia in this respect however. The phenomenon of male sons living in the city being the main decision-maker in the household has only been observed in the Ethiopian sites, and not in the Kenyan ones. The situations of 'remote control' by sons living elsewhere are reported in both Hawassa and Asella; the authority of the son is explained by referring to 'his' ownership of and control over the land (irrespective of how land is legally registered), and hence the income derived from it. The fact that he does not contribute any labour to the farming process, is not considered a disqualifier for his decision-making authority.

Males were the key decision makers in the two FFHWAML and one of the FHHWOML in Asella. This is also the case for one of the two FFHWAML in Hawassa; the women in the two FHHWOML in that site take decisions on the harvest themselves, because the amount is so small. One of them will ask for a man from the community to accompany her to the market to sell the little surplus she has.

In both Kenyan sites, the female household head is the main decision maker, in both FHHWAML and FFHWOML. These women can decide to consult their sons living in the city, but the authority for the decisions resides with her. These type of relations differ fundamentally from the ones of FHHs in Ethiopian household under remote control: in Kenyan cases, sons in cities can offer social capital to their mothers by providing advice or financial support, whereas in the Ethiopian cases, sons in cities constrain rather than enable women's decision-making power. Some of the Ethiopian women decided to cut the ties with their sons, after giving them their share of the land, in order to gain more control over their household: these women have not only lost part of the household resources (land), but also the social capital of their son's knowledge and resources to support their livelihoods.

DECISION-MAKING ISSUES IN RELATIONS AMONG WOMEN

Field work in the four sites did not report much dynamics on relations between women in FHHs. In most cases where female heads were in control of decision-making, no observations were made on diverging interests or tensions between women within the same household. A notable and important exception to this, is the situation of daughters-in-law in both Kenyan sites. At marriage, women farm with their mother-in-law, until the next wives enter the family of her husband. During the time, when a daughter-in-law farms with the mother-in-law, she is expected to assist her in all work, including farming as well as household work. In many cases, daughters-in-law have little autonomy to take decisions for themselves. Daughters-in-law do not make independent decisions; rather, decisions are made on their behalf by their fathers and mothers-in-law, in combination with their husbands. In Laikipia, young women indicated to feel helpless in the houses of their mothers-in-law. These daughters-in-law have no say in what work to perform, or in decisions about mechanization or reducing labour burden. The youngest daughter-in-law in a family is the one who remains for the longest with her mother-in-law.

EFFECT ON DEMAND ARTICULATION AND ADOPTION OF LABOUR SAVING OPTION

In terms of effect on demand articulation and adoption, intra-household decision-making has the most direct effect. Making a decision to use tractors or hire labour is articulation of demand. In the vast majority of the MHHs, and in the FHHs under remote control, women have no or very little say in such decisions, and hence have no opportunities to articulate demand for mechanization. For the FHH that have decision-making authority, this implies that they are positioned to articulate demand for mechanization; yet, as we have seen, for them it is more the lack of resources that constrains the articulation of that demand.

Our analysis in this chapter underlines that decision-making dynamics do not stand on their own. Most of the issues pertaining to access to and control over resources and to values and assumptions are key elements shaping and justifying the authority and bargaining power household members have in decision-making. In both positive and negative ways, women's bargaining power in the household is undermined by the low recognition of their

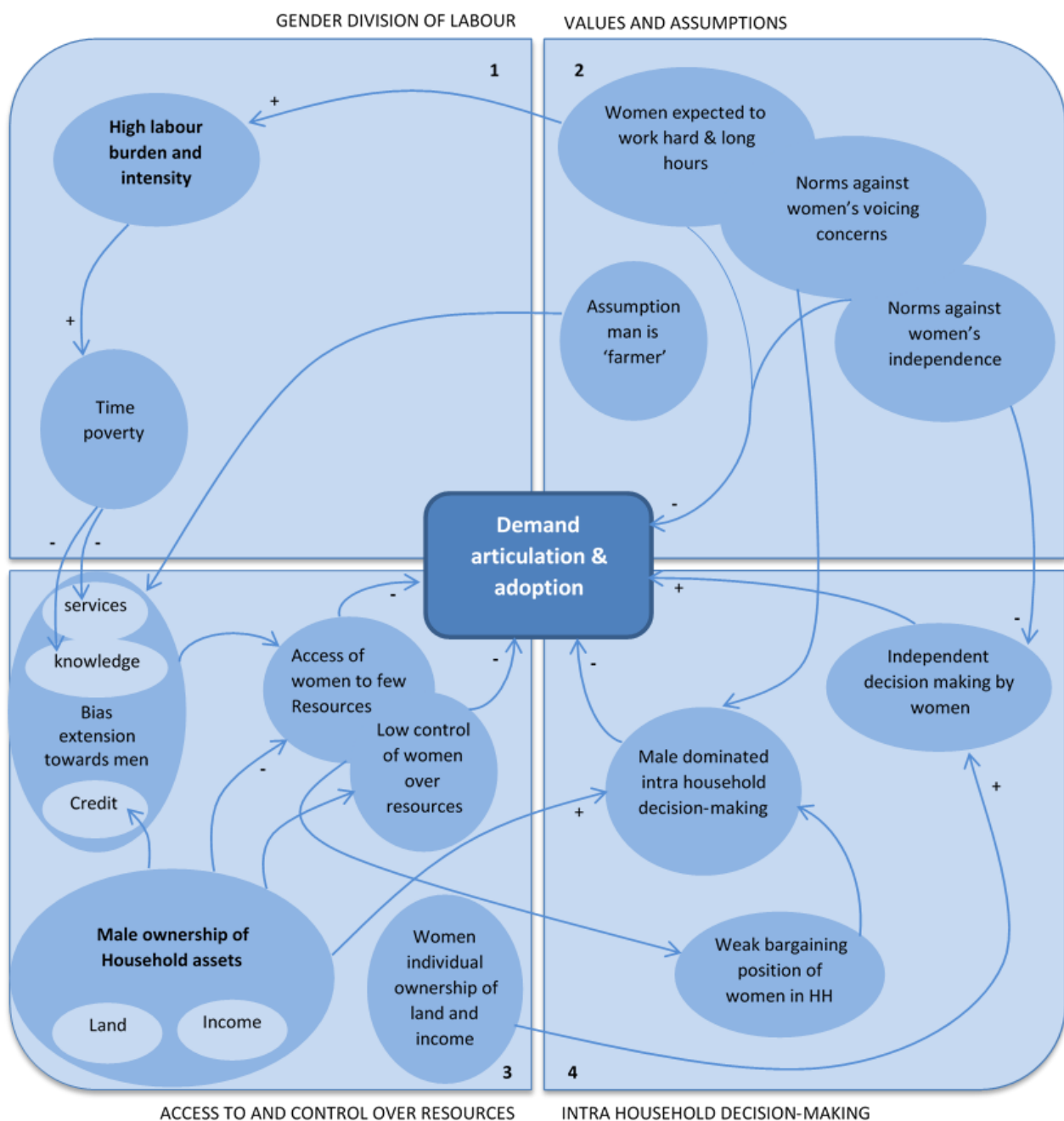
labour and contributions to the household economy. Moreover, their limited access to and control over resources is also used to justify their exclusion or low level of involvement in decision-making. This is further reinforced by values against women's independence. On the positive side, the exceptions show that when women have full control and authority over resources, they are also positioned for independent decision-making. In the final section of this chapter, we will present the model as a whole, and highlight the interrelations between the dimensions.

5.5 - REFLECTIONS ON THE MODEL

Having looked into and unpacked what is going on in the different dimensions of gender relations as we conceptualized it in the initial analytical framework, this is now the point to bring these findings together into an explanatory model. Figure 3 captures what is going on in the different dimensions, and also how these dimensions relate to each other and impact on demand articulation and adoption of mechanization.

High labour burden and intensity of women in different households is the result of the gender division of labour, is due to their involvement in farming tasks both on and off-field, and the connections with their reproductive labour. The gender division of labour is not static, but changing; some trends actually further increase women's labour burden, especially trends of men disengaging from agriculture.

Figure 3: Gender dynamics in demand articulation and adoption of mechanization



Our findings reveal that:

1. High labour burden of women does not translate into demand articulation and adoption of mechanization, except for a few exceptions . (quadrant 1)
2. One of the factors leading to the low articulation of demand are norms that expect women to work hard and long hours, combined with the low recognition of women's labour and its value. (quadrant 2)
3. Norms against women voicing concerns about their individual well-being, against women owning and controlling resources, and against women's independence further undermine women articulating a demand for reducing their labour burden. (quadrant 2 affecting quadrant 3 and 4)
4. Changing norms about what women can do in combination with men disengaging from agriculture, increases women's labour burden. (quadrant 2 affecting quadrant 1)
5. A strong assumption of the man being the farmer limits women's access to extension, information, knowledge and services. (quadrant 2 affecting quadrant 3)
6. The time poverty of women, due to the gender division of labour, constraints women's possibilities to access services, information and knowledge – as well as organizing. (quadrant 1 affecting quadrant 3)
7. A key factor leading to the low articulation of women of demand to reduce their labour, and specifically for mechanization and tractor power, is a result of women's low access to and control over resources. These resources include: extension services and information, land and income from farming, and social capital (women organizing). (quadrant 3)
8. Even though the net effect is the same for women across household types, in terms of most women having low control over resources, it is important to understand the different dynamics in different households. Women in MHHs have little access to and control over such resources, and this undermines their ability to articulate demand and adopt labour reducing options. Women in FHHs have higher levels of control over resources, but generally have smaller assets and income bases to draw from. (quadrant 3)
9. High demand for reducing labour burden, and especially adoption of mechanized farm power, is only observed by women who control land individually or who have independent income from formal employment. (quadrant 3)
10. Decision-making authority is the key to articulation of demand. (quadrant 4)
11. Decision-making authority is not based on labour contributions (quadrant 1 affecting quadrant 4); authority is justified on resource ownership and dominant values. (quadrant 3 and 2, respectively, affecting quadrant 4)
12. Women articulate demand and adopt mechanization only in independent decisions, hardly through joint decision-making with male relatives (either husbands or adult sons). (quadrant 4)
13. Women's weak bargaining power in household decision-making is the result of their limited control over resources and reinforced by the low recognition of their labour and negative norms against women's independence. (quadrant 3 and 2 affecting quadrant 4)
14. Independent decision making for women on demand for and adoption of labour reducing options, and particularly mechanization, only takes place for women who have direct and sole control over land and off-farm income. These are game changers. (quadrant 3 affecting quadrant 4)
15. Independent decision-making by women on labour reduction and adoption of mechanization is confronted with social disapproval, and comes at the costs of losing social capital, both within the household (conflicts, violence, loss of support of husband or son) and the community (relations with community members). (quadrant 4 interacting with quadrants 2 and 3)

By bringing together these dimensions and factors, the model brings to the fore that it is not labour burden in itself that leads to the articulation of demand for and the adoption of options to reduce labour intensity. In fact, the two key factors are access to and control over resources, and values and assumptions. Without insight into what is happening here, and what the opportunities and constraints are for women and men in different types of household, it is impossible to grasp women's demand articulation and adoption.

Moreover, the model also makes insightful that it is not one of the factors, or one of the sub-factors under each

dimension, that is the key constraint; rather, it is the interplay among factors and dimensions that undermines women's demand articulation and adoption. The different factors reinforce each, and in many cases these interconnections further undermine demand articulation and adoption by women. It is this interlocking of factors that explains the strength of the gender dynamics at play.

Finally, the findings reveal that gender dynamics are not universal, nor static. They are changing: we have observed changes in the gender division of labour, in norms and values, in access to and control over resources, and in decision-making. This points out that, even though gender relations are hegemonic, they are also unstable and can change. Some changes are more positive, others are more negative. Moreover, some changes have more potential to destabilize the model as a whole (for instance, sole land ownership or formal employment by women), than others (women taking over ploughing, or women accessing income by secretly selling small part of the harvest). In the next chapter, we will go back to the original research questions and hypotheses, and translate our findings into recommendations.

6 CONCLUSIONS AND RECOMMENDATIONS

This study explores how gender matters in small-scale farm power mechanization in agriculture. It set out to investigate how intra-household gender dynamics affect women's articulation of demand for and adoption of mechanization. The approach and analysis is based on a relational understanding of gender, and a need to differentiate between different household types as well as to look at different individuals within households. This study is funded by the Competitive Grant Initiative of the CRP MAIZE (CGIAR research program on maize-based farming systems). The study contributes to the development and consolidation of a gender knowledge base on maize farming systems. From the onset, we sought to link this study to the work of the FACASI project, of which the development of mechanized technology, 2WTs in particular, as well as the development of business models are key features. In this final chapter to the report, we pull out the key findings of the study, and seek to indicate their implications for technology development and business modeling. The chapter starts with main findings at the empirical level as well as those on gender dynamics, women's demand articulation and technology adoption. The last part of the chapter presents the recommendations.

6.1 - THE PARADOX: HIGH LABOUR INTENSITY, BUT LOW DEMAND ARTICULATION

In Hawassa and in the two Kenyan sites, maize is considered a major food and cash crop and considered important by all household members. In Asella, maize is grown at the homestead and women seem to appreciate maize more than men do. Labour is highly segregated: across all sites, only women are responsible for household work and other reproductive activities. Across sites, a significant part of the agricultural work is done by women (household heads, wives, daughters and daughters-in-law). In the Ethiopian sites, male household heads as well as male household members participate in farming; in the Kenyan sites, male household members only occasionally participate in farming, and then predominantly in the tillage and land preparation stage. Many women talk about their experience of men disengaging from providing labour to the household, and how women are taking over tasks that were conventionally done by men.

The farming activities that women consider as contributing to their labour burden include: weeding, tillage and land preparation, post-harvest management and transport of agricultural produce. In addition, women's labour burden is affected by the intensity of the work on chopping and collecting fodder, fetching water, and the reproductive labour, especially child care. The ranking of labour intensive tasks varies by context. A key factor in determining whether tasks are labour intensive is the reliance on women's muscle power: women consider all tasks where they have to solely rely on their own muscle power (such as for weeding, fodder collection or transport of produce carried on their own backs) or hand-tools (as for threshing and grinding) as highly labour intensive.

So far, there has not been a lot of experience with mechanization in the study sites (see also Bymolt & Zaal *et al.* 2015). Tractors are only used in the Kenyan sites and more in Laikipia than in Bungoma, and a general pattern is that women have less knowledge and experience with tractors than men do. Across sites and household types, hiring labour and animal drafts are the most common ways to reduce labour burdens. Similar to the case of using tractor power, these mainly apply to reducing labour in the land preparation phase of the farming cycle. These options, in other words, do not address many of the tasks that women find most burdensome in the maize farming cycle, nor do they address the labour intensity of women's reproductive responsibilities. This also counts for tractor power, which, when used in the Kenyan sites, is only to a very limited extent used to address the labour intensity of the tasks that women are mostly responsible for.

Multi-functionality of tractors has been identified as a key feature for technologies to benefit women. In one of its reports, FACASI concludes, among others, that multi-functionality has been 'is the way to reduce women drudgery and also fit mechanization in smallholder circumstances that are characterized by small, highly fragmented and routine subsistence and economic chores' (Misiki et al. 2013: 10-11). Multi-functionality of 2WTs might be an important entry point to mechanization of women's labour tasks. Yet, the actual practice of multi-functionality is low so far (see Bymolt & Zaai *fc.* 2015). Moreover, the costs of buying or hiring additional equipment have to be taken into account, and will affect the realization of the multi-functional potential.

The benefits that can be derived from the use of tractors are gendered. Mechanization can lead to improved productivity¹¹, but this does not necessarily benefit all household members. In MHHs, especially in the Ethiopian sites, men in general make the decisions on the allocation of labour, on what part of the harvest is sold, and also on how the income will be used and what expenses will be made. With increased production of maize there are some indirect benefits for women in these households, as they can access more of the produce which they can sell (openly or secretly). Another indirect benefit is that mechanization of 'male labour' in farming, for instance in land preparation and tillage, can reduce women's labour when (1) men spend less time in the field, and women need less labour to prepare and transport food to the fields, (2) the family would keep less animals, and women spend less time on collecting and chopping fodder, and (3) when planting is done in a timely manner, and weeding is reduced (ripple effect). There can also be adverse effects, as existing literature on technology adoption pointed out, such as higher workloads, loss of control over resources and income. Neither direct nor indirect benefits, hence, can be assumed, but have to be monitored.

FHHs have less options and means to reduce labour intensity due to their more limited access to cash and financial resources. FHH without access to male labour have the least options of all households, and they rely primarily on the labour of the members of the household, with particular implications for young women and girls. To reduce their labour burden, women in MHHs mainly rely on using the labour of other household members, and are otherwise dependent on the willingness of the head of the household to invest in other labour saving options such as labourers. The big shift in reducing labour burden and in access to and control over benefits from mechanization, occurs for women who own their own resources, either through formal employment or when owning land. Independent control over resources is a game changer in decision-making in adoption of mechanized equipment to address women's labour.

Across sites, the high labour intensity of women is not addressed by local organizations or women's groups. The study did not look into these groups and local organizations in an in-depth manner. Our 'quick look' did not encounter examples of women accessing mechanized technologies through women groups or women purposefully organizing with accessing mechanized technology in mind.

Our first level finding is hence a paradox: women in different ways – that means, in different households and in different sites - experience high labour burden and intensity. Yet, only in exceptional cases do women articulate demand for mechanization and use tractor technology. Does that mean that women do not have a demand for mechanization, or are other factors at play that explain the low demand articulation and technology adoption levels? The low articulation by women of demand for small-scale mechanization has to be understood within a broader picture of low levels of adoption of 2WTs in particular, and mechanization in general (for details, see Bymolt & Zaai *fc.* 2015). Demand for and adoption of mechanization are related to factors such as the (perceived and actual) costs and benefits of tractors, plot size and land suitability, availability of 2WTs, and the supply chain and hiring arrangements (*Ibid.*). Gender dynamics are a set of factors that specifically affect women's ability to demand and adopt mechanization. In the next section, we focus on our conclusions of these specific factors that are related to gender dynamics.

¹¹ For more information on the impact of small-scale mechanization on productivity (in the context of conservation agriculture), see Bymolt & Zaai (*fc.* 2015) and <http://www.fao.org/ag/ca/index.html>.

6.2 – GENDER RELATIONS, DYNAMICS AND VARIATIONS

A comprehensive analysis of four dimensions of gender relations and dynamics in maize farming households reveals that women's high labour burden does not translate into the articulation of demand for and adoption of mechanization due to the complex interplay of values and assumptions, access to and control over resources, and intra-household decision making. Factors in each of these dimensions negatively affect women's ability to articulate demand. Firstly, values and assumptions make women's work invisible and go unrecognized. Secondly, a general and consistent pattern regarding resources, is that women lack access to and control over a range of resources, including land, income, and extension services. Thirdly, the gender division of labour exacerbates this limited access, because women's time poverty negatively affects their access to resources and information. Finally, decision-making is a male domain, and women are mostly excluded or merely informed.

The study also finds that it is not only the influence of each of these separate dimensions and factors, but especially the way in which they affect each other, that is key to understanding gender dynamics. Many factors interlock, and as a result reinforce each other in undermining women's opportunities to articulate demand and adopt mechanization technology or other options to reduce their labour burden. It is this interlocking that explains why changes in the gender division of labour do not translate into changes in access to and control over resources. It also adds perspective to see that changes in the division of labour do not lead to changes in the relations of production; in fact, changes in labour division might occur within the existing status quo, and benefit men. One observation is that changes usually imply women taking over tasks formerly assigned to men, but hardly ever men taking over for instance women's reproductive tasks. The status quo also remains intact in instances where women's labour burden increases under the influence of men disengaging from agriculture. Cases of remote control by adult sons over resources, income and decisions in female headed households also attest to this point.

Access to and control over resources, as well as values and assumptions are key dimensions of gender relations that constrain, or can enable, women's demand articulation and technology adoption. This conclusion is not only based on an analysis of factors that constrain women's demand and adoption, but is also confirmed by the exceptions of women in MHHs with sole ownership over land or in formal employment, who are the only women that articulate demand for tractors and actually hire them. This conclusion implies that, if interventions do not engage with these two dimensions of resources and norms, they are unlikely to have a structural impact on gender relations and women's position. If this is related to the point about interlocking factors and dynamics, a next lesson is that unequal gender relations cannot be altered by single solutions – magic bullets – in whatever domain, but require integrated approaches, acknowledging the interplay between factors and dimensions (see also (Quisumbing & Pandolfelli 2010).

Our analysis has brought forward two additional insights. Firstly, gender relations are not static, but changing. In some sites and some households, women are taking over men's work, and become involved in tillage, ploughing and land preparation. There are also changes in values, for instance with some households and some men increasingly recognizing women's labour burdens and interests. Changes occur also with respect to resources; changes at a relatively small scale, such as women participating in training, or ones with larger implications, such as women inheriting or buying land, women achieving educational qualifications, or women having formal employment. Also in decision-making, changes can be observed in level of sole or joint decision-making. Again at smaller or larger scale, with some women being more involved, or more informed, about household decisions, vis-à-vis women who can take decisions independently.

The second important insight that merits attention are the variations in

Box 4 - Key lessons

1. If a project does not engage with gender relations and dynamics, especially access to and control over resources, and values and assumptions, it is unlikely to have a lasting and structural impact on gender relations and women's position.
2. The interlocking dimensions and factors imply that gender relations and dynamics cannot be altered by single solutions or magic bullets; they require integrated approaches.
3. Demand for mechanization and adoption of options to reduce labour burden cannot be assumed; the same counts for the benefits of adoption of mechanized technology.

relations and dynamics between sites, between household types and even within household types. The findings point to variations between MHHs and FHHs in terms of options that are pursued to reduce labour burden. On the one hand, MHHs are able to opt for more costly possibilities as hiring animal drafts and tractors, in addition to hired labour. FHHs, on the other hand, also use animal drafts or hired labour, but do not use the relatively costly tractors, and actually more often rely on pooled or family labour which does not involve financial transactions as such. The analysis of gender dynamics revealed that such differences in adoption can be explained from variations between and among households in access to and control over resources, and decision-making process, under the influence of values and assumptions.

One important variation concerns the one between households in which resources and decision-making are controlled by men, either in MHHs or FHHs under 'remote control', vis-à-vis FHHs in which women own resources and have authority to make decisions. In the latter, demand articulation is hampered by a low assets base and low incomes; in the former two, the household might or might not have more resources, but women have little or no control, and hence are constrained in demand articulation and technology adoption. Whereas one might wonder that the net effect is the same and the detailed gender dynamics are hence of little added value, on a second thought, the instances differ in terms of what the bottleneck is, and hence call for a different approach or remedy when seeking to reduce women's labour burden and enabling their adoption of mechanization.

A related, important observation is that the possibilities and constraints for women in the same type of household also vary. Women in some FHHs have low levels of control over resources and decision-making, whereas women in other FHHs have full decision-making authority. This shows that women's control over resources in households that are not headed by men, is governed in different ways. Variations also occur among women in MHHs; whereas most women in MHHs have limited opportunities to articulate demand for mechanization or to reduce their labour burden, some women who are formally employed or own land individually can and do adopt it. The significance of acknowledging these variations is that options, demand and even benefits cannot be assumed for household types, let alone for individuals within them.

6.3 - RECOMMENDATIONS

So where does this leave us? A paradox, interlocking gender dynamics, and variations and diversity in dynamics. The picture, unfortunately, reveals more challenges than opportunities. At this point, it is important to acknowledge that the findings and their implications cannot be addressed with easy solutions or quick fixes. They call for a recognition that the project is affected by the complex interplay of gender norms, gendered access to and control over resources and decision-making. Moreover, a technological intervention itself also affects gender relations and dynamics. These acknowledgements challenge some of the assumptions of technology oriented interventions. In terms of recommendations, this implies that some of them can be taken up within the existing frame of the intervention project, whereas others might challenge or go beyond that frame.

What the findings call for is the articulation of a theory of change for addressing gender equality concerns through interventions like FACASI. That is, to clarify assumptions about social change processes and how they can be affected through project interventions, and next, to design intervention strategies and activities on that basis. Such a theory of change has to find a balance between *being modest* – that is, acknowledging that there are limits to the change an intervention can bring to gender relations and dynamics –, but at the same time also *be bold* and brave – by engaging with them and their implications.

In addition, the theory of change also has to engage with how the intervention will *not do harm*, undermine women's position and reproduce or exacerbate gender inequalities. Critical concerns here are increase in labour burden (e.g. additional tasks, women taking over men's tasks, processing larger volumes) and loss of control over or access to income and benefits. The theory of change also has to the need for *integrated approaches*. One can

consider integrated approaches in two ways: one way in which integrated can be understood, is in the sense of each intervention taking all four dimensions of gender relations and dynamics into account. Alternatively, the different factors and dimensions are taken into account by a set or series of interventions.

The recommendations have been developed to give guidance to projects like FACASI on how project interventions can be designed to better engage with the broader social context within which agricultural mechanization is introduced. That means, they translate the key lessons (in box 4) into entry points and directions of what tasks and technologies to focus on, and how to engage with how gender norms and gendered access to and control over resources affect women's demand articulation for and adoption of mechanization. These also have implications for project management, and several recommendations on that are presented at the end.

ENGAGING WITH THE TECHNOLOGY AND ITS DESIGN

Entry-point – technology or women's needs?

It is important to be explicit about the starting point of the intervention: is it the technology or is it women's needs and/or the potential benefits they could derive from mechanization? If the technology is the starting-point and fixed (such as 2WT), there are currently limitations in what labour intensive tasks of women can be addressed. Adoption of tractor power depends also on plot size and land suitability, amongst other factors.

If the starting point is women's needs and interests:

- this calls for attention for technologies and approaches that address planting, weeding and processing.
- the project could opt to include and promote mechanized technologies that directly respond to women's labour burden (such as *shellers*, *grinders* etc.).
- When considering the amount of women's burden and intensity in relation to *weeding*, technology development can also engage with solutions that can positively affect weeding labour indirectly. Timely planting, or the use of fertilizers, are examples of interventions that can reduce labour demand in weeding.

The choice of where to focus technology development can also be informed by the points in the process where women, due to their positioning as well as to the nature of the farming activity, are more likely to access mechanization.

- When women have less resources under their control, high demand can push women out of the market. Because *ploughing* is time-bound, it may be more difficult for women to access mechanization, as demand for tractors is high in a short period of time. *Threshing*, by contrast is less time-bound; the demand is less high and less confined to one period, and this can enable women's access to and use of mechanized equipment, even when they have fewer resources under their control.
- The multi-functionality of mechanized equipment, in particular tractors, has been identified as a key feature for technologies to benefit women. Much thinking has already gone into developing additional appliances so that 2WT can be used beyond ploughing and tilling, and also for planting, weeding, milling etc. The project should consider exploring further how the interrelatedness of different tasks in maize farming households can be taken into account in the design and testing of farm power technology.

Involving women as co-designers of mechanized technologies

By involving women in the design of mechanized technologies, new features that so far have been overlooked could possibly surface – such as addressing women's multitasking of productive and reproductive work. Involve women in the technology design and get surprised. In addition to that, involving women in the design and testing of technology can offer a window of opportunity to open up conversations about the realities of different women and men, of different ages and socio-economic backgrounds. This will provide more insight into their demand, interests, priorities, opportunities and constraints, and also offer a chance to engage with people's ideas regarding gender.

Project interventions should engage more consciously with gender norms and values that affect women's articulation of demand for and adoption of mechanizations. That can be done by deliberately reaching out to women farmers, as well as by explicitly engaging with norms and relations.

Reaching women farmers

The findings of the study call for specific targeting strategies and appropriate mechanisms to ensure that different women from different types of household can benefit from project activities. That means:

- Explicitly seeking to include women as contact farmers, women members of farmers organizations, women extensionists, women's groups, and so on.
- Ensuring that the capacity development activities of the project are gender-sensitive, in terms of for instance their timing (matching women's availability), location (related to women's mobility), and respond to women's limited resources and decision-making authority.
- Ensuring gender aware dissemination of information dissemination, in terms of choice of communications channels, language, timing, sex of service providers and trainers, and so on. The project should endeavor to go beyond 'farmers' days' and conventional trainings/ information materials and design more creative ways of informing and training women and men about 2WTs. Use of local media can contribute to exposing male and female farmers to new options and ideas, and new ways of engaging with gendered constraints. Another way could be by organizing ploughing competitions or other similar events.
- In information dissemination, deliberately 'show-case' women role models who have used or adopted 2WTs or similar technologies successfully, or women who have challenged gender stereotypes. Moreover, models farmers can include women who are using mechanized power, as well as households with more progressive husbands that support women's initiatives to reduce their labour burden and make independent decisions.
- Opting to work deliberately with households and individuals that are willing to change gender relations and dynamics. Such initiatives of show-casing in themselves might not alter gender dynamics in their base, but do contribute to the non-reproduction of assumption that farmers are only men.

Engaging with gender norms and relations

Designing (with partners) a set of structured/facilitated activities for target communities will facilitate the discussion of the constraints and opportunities of different women experience as farmers. Such community dialogues have been initiated in other programs, e.g. World Food Programme in Ethiopia (Hailemariam 2013). Community dialogue interventions deliberately seek to steer the discussion beyond gender roles and women's labour burden to issues around access to and control over resources, decision-making and gender norms. Ideally, this process should provide different groups of women and men from different household types (such as male heads of households, female heads of households, wives from MHHs, daughters in-law, girl children) with the opportunity to, first, discuss separately with peers, and then to share their perspectives in a mediated community-group setting.

Such a process serves several objectives. First, it deepens the understanding of the gender dynamics at play - for the individuals, groups, communities, and project. Second, it serves to identify ways to engage with and leverage 'cracks' and/or examples of positive deviance, such as changes in gender division of labour, mothers' attempts to educate their girl children, and so on. Third, it assists in identifying in the specific local context the main blockages and possible solutions. This is about exploring, and if possible, supporting positive social change in attitudes and values towards women and their work. For example with respect to ploughing that is reported to be considered a valuable skill for girls in Ethiopia: the community dialogue can engage with this to explore whether this is a positive trend or not, and whether is it an entry-point for the project to target more young women. Fourthly, it stimulates the articulation of women's demand for support/mechanization in the household, community and vis-à-vis project and other service providers.

The study has pointed out how women's limited access to and control over resources constrain their articulation of demand for and adoption of mechanization, with variations between women in different household types. It was also observed that 2WTs, because of the cost of investment, were considered out-of-reach for individual women. Project interventions should recognize and engage with gender opportunities and constraints in access to and control over resources. The gendered constraints that women face in articulating demand and in adopting mechanized equipment have implications for the principles of business modeling.

Further research: follow-up questions

The current study has focused on intra-household dynamics and women's articulation of demand *within* the household. The scope of the study did not allow for investigating how gender dynamics interface with the mechanization supply chain. The hypothesis is that the access of women and men to the mechanization supply chain differs, and possibly shows variations between household types and sites. Follow-up research is needed to further look into how gender dynamics position and enable different household members to access the mechanization supply chain, both as potential clients/beneficiaries and as potential chain actors. Follow-up research can more concretely include:

- A literature review on other technologies of small mechanization, specifically looking at existing insights regarding gender dynamics and business modeling, in particular gendered access, outcomes and impacts of small mechanization.
- Empirical case studies on existing mechanization technologies. These can include treadle water pumps, threshers, shellers, combined harvesting, and possibly also draft oxen. Key questions concern (1) to what extent women access selected technologies through different business models, and (2) how these technologies and the business models affect gender relations.
- In a later stage, and building upon insights from a review of existing literature and analysis of specific cases, new gender sensitive business models can be tested with women entrepreneurs and women beneficiaries in a selected number of sites. Such a testing project will benefit from a participatory monitoring approach to capture the learning.

Principles for business modeling

Demand articulation and technology adoption calls for an engagement with gendered constraints. These are multiple and interlocking, and on top of that, different for women in different sites and different households.

A first way to translate the findings of the current study to business modeling, is to take labour burden as the starting point for business modeling.

- This would call for business models that can meet the needs of those women that face the highest labour burden. This means *targeting specific groups of potential clients*. These include women in female headed households without access to male labour, as well as for instance daughters-in-law in male as well as female headed households.

A second way to translate the findings of the study to business modeling is by translating them to principles for business modeling. More gendered principles for business modeling would include:

- *Integrated* approaches, that address the multiple constraints that women face (in control over land, access to marketing, control over income, access to credit, access to knowledge, low decision-making power, etc.)
- Lower input *costs*; the hiring of tractors is too costly for many households; it is not accessible for FHHs, and not accessible for women who do not control large assets or independent income.
- Contribute to *control over outputs* and benefits: business models should look into ways that women can retain control over the benefits of their investments and labour.

- *Multi-functionality*: business models should promote that the potential multi-functionality of tractors is realized. Hiring arrangements reduce input costs to adoption of tractors, but at the same time can also undermine the multifunctionality. In theory, 2WTs can be used for different tasks and in different stages of the farming and production cycle; in practice of hiring, this means that for each task the users have to pay for the actual hiring. This calls for a consideration of the costs and perceived benefits. When a tractor is hired to assist in tillage and land preparation, that does not mean that it will also be hired one for weeding or post-harvesting activities.

Group formation and collective action

While the study found little or no organizing of women around labour concerns or access to mechanization, the idea of women accessing mechanization/2WTs as a group was discussed with study participants and during the validation workshop. This idea could possibly be developed into a gender-aware business model. Such a strategy can be further developed by:

- Collecting and learning from the experience of potential partners and service providers at all levels with facilitating and supporting women's groups in the specific contexts.
- Building on insights from the extensive body of knowledge on micro-credit. Group based credit schemes, possibly with low interest rates and long repayment periods, could be set up so women could access financial resources and acquire multifunctional 2WTs. It is likely that there are existing credit schemes and/or organizations in or around the target communities; the project can hence build on local expert knowledge and lessons learned.
- Earlier experiences with women's groups and entrepreneurship have pointed to the need to ensure that the groups get sufficient support (possibly from partners) including training on operating and maintaining 2WTs, as well as "business training" for the women's groups to hire out the 2WTs to earn an income that could partly be used to repay the groups loan, and partly be shared among group members.

THE PROJECT ORGANIZATION

The findings as well as the earlier presented recommendations also have implications for the project itself, in terms of how it functions as well as its internal capacities.

M&E

Because gendered needs, gendered constraints and gendered impacts cannot be assumed and are context specific, projects require continuous monitoring. This calls for a detailed gender review of monitoring and evaluation plan of the project and for the development of indicators that could track changes related to gender equality. This implies firstly, to select gender indicators from different dimensions of the analytical model, and secondly, to monitor them on a regular basis. This will allow the project and intervention to address unintended consequences as well as opportunities that arise.

Building the capacity of staff and partners

The need to respond to gendered constraints calls for a gender-sensitive capacity of the staff that designs and implements the project activities and interventions. The staff of both FACASI itself, and key partners and stakeholders in the project, hence require gender analytical skills as well as competences to engage in conversations on gender norms and constraints, and to be able to deal with resistances. Apart from hiring gender specialists and providing gender training, the project can benefit from identifying governmental and non-governmental organizations (or sub-offices) that can assist the project in addressing gender issues. For Ethiopia these could include: the Gender and Capacity Building Office of the Ethiopian Institute of Agricultural Research (EIAR), and Women, Children and Youth Affairs Offices.

Action research

Action research is a methodology to unite a group of people (project staff, together with women or disadvantaged groups in particular) around a shared concern related to access to and control over resources (such as farm mechanization), and to engage them in joint analysis and reflection. Local civil society can be considered as facilitator of the action research process with capacity building and technical support from outside experts.

Action learning can also be a method for stakeholders to work together and explore important complicated development problems – such as how to develop gender-aware business models for 2WTs - and to learn from their collective attempts to change approaches and practice. Participatory action learning groups are established as the main vehicle for action. The learning group meets regularly over a pre-defined time period to identify a key development problem, develop an action learning project, review progress, and practice peer support as they address practical concerns and issues arising and plan new individual and group actions. An action learning trajectory can be designed and launched with different FACASI stakeholders (government, private sector, civil society, community based organizations).

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