

# Assessing drudgery and mapping demand for small mechanisation in Assela and Hawassa of Ethiopia

## Farm Mechanisation and Conservation Agriculture for Sustainable Intensification (FACASI) Project baseline study of April 22-25, 2014

### Technical report

M. Misiko<sup>1</sup>, M. Tsegaye<sup>1</sup>, B. Teshome<sup>2</sup>, B. Getnet<sup>2</sup>, G. Moges<sup>2</sup>, F. Baudron<sup>1</sup>, D. Tirfessa<sup>1</sup>, E. Berta<sup>1</sup>

<sup>1</sup>*International Maize and Wheat Improvement Center (CIMMYT - [cimmyt.org](http://cimmyt.org)) P.O. Box 5689 Addis Ababa, Ethiopia. Tel: +251 11 646 2314 Fax: +251 11 646 1252*

<sup>2</sup>*Melkassa Agricultural Research Centre, Melkassa, Ethiopia. P.O. Box 436 Nazareth, Ethiopia.*



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## Summary

### Sites

Five focus group discussions (FGD) were organised in two sites of Assela (Dosha Gura, Haro Belalo and Shalla Chebete villages), and in Hawassa (Dore Bafeno, Tulla and Wondo Genet villages) on April 22-25, 2014. These FGD are part of the Farm Mechanisation and Conservation Agriculture for Sustainable Intensification (FACASI) Project baseline study.

### Project goal and study objective

FACASI seeks to improve access to mechanisation, reduce labour drudgery, and minimise biomass trade-offs (i.e. competition for biomass between the livestock and the soil), through promotion and adoption of two wheel tractor-based technologies. It is being implemented in Ethiopia, Kenya, Tanzania and Zimbabwe. The objective of this FGD was to map power demand trends, by studying forms of drudgery and sources of power in Assela and Hawassa, Ethiopia.

### Study approach

Each FGD had two parallel gender-segregated sessions each consisting of 8-14 women or men. Participants were sampled based on their farming experience and contextual knowledge on mechanisation. Data were generated through participants' valuation of mechanisation percentages, frequencies of tasks, and discussions on the local meaning of drudgery, estimation of trends of mechanisation, constraints, animal feed changes and mechanisation opportunities among men and women farmers. Further participatory analyses were done through combined women and men sessions, to encourage debate and in-depth reflection over the gathered data.

### Findings

Data from these FGD exercises show lowest mechanisation among women-dominated tasks. This includes tasks one with animal draft, except for water fetching that is dominated by women. Findings show that in spite of drudgery related imbalances among women and men, there were interrelatedness in household tasks. Level of women labour drudgery was often directly dependent on how well men performed their tasks. For instance, when tillage was efficiently done, there was less weeding, if transport was organised well by men women would travel less to fetch water, decent construction ensured grain storage was adequate. However, chores mainly done by women were often routine and more frequent, with minimum use of appropriate equipment, less animal power and least mechanisation. Ethiopian farmers also pooled resources? i.e. teamed up oxen and labour esp. when individual households did not own complete spans of draught animals.

### Introduction

There is urgent need for mechanisation that is suitable among rural farmers, for gainful and sustainable farming intensification given the increasing labour shortage. If current mechanisation decline trend continues, the existing fragile and unsustainable agricultural production based on high labour drudgery with higher burden among women will only complicate the fight against poverty. This is the rationale for the current FACASI study that looks at gender, *agri-culture*, drudgery and possibilities for appropriate small mechanisation.

## Objective of the current study

This study aimed to map power demand and use trends, by studying forms of drudgery and sources of power in two farming agro-regions of Assela and Hawassa, Ethiopia.

## Methodology

### Sites

This study was conducted in two sites of Assela (Dosha Gura, Haro Belalo and Shalla Chebete villages), and in Hawassa (Dore Bafeno, Tulla and Wondo Genet villages) on April 22-25, 2014. These are Farm Mechanisation and Conservation Agriculture for Sustainable Intensification (FACASI) Project sites. The FGD were part of FACASI baseline study.

### Focus Group Discussions

There were 5 focus group discussion events. Each event had two parallel gender-segregated FGD sessions with an average of 10-15 participants. The overall theme was the way mechanisation could be enhanced among men and women smallholder householders. Focus groups were structured to yield specific quantitative and qualitative information in a short time. Quantitative information was mainly frequencies and percentages of ownership and use of machinery, growth in machinery use, amount of work done by men and women, and what equipment were used among each gender. Qualitative data were mainly on gender roles, definitions or ranking of tasks or drudgery.

The Ethiopian Institute of Agricultural Research colleagues undertook prior selection of FGD venues through consultative meetings with farmers. These meetings also identified suitable public or communal places to host the parallel FGD gendered sessions.

Focus group discussions had the following themes:

- i)* household tasks
- ii)* agricultural production
- iii)* processing (of produce)
- iv)* transport
- v)* timber and/ or construction

For each of these themes, participants identified and analysed key tasks, and derived:

- i)* frequencies of performing these tasks e.g. daily, weekly or seasonally
- ii)* percent of task performance by each gender
- iii)* percent sources of power for each task i.e. human muscle, animal draft or machine
- iv)* general trend of source of power in the recent 10 years
- v)* machine or equipment ownership, whether owned individually, collectively or hired

### Sampling

Participants in each site were men and women farmers, extension and development workers. These were selected based on purposive targeting of those with required contextual knowledge on mechanisation and local farming. Participants were selected from across the target sites, identified through consultation with local knowledgeable persons, especially leaders of active farmer entities, extension staff, field crops officers, etc.

The FGD leader was an experienced facilitator of groups, an anthropologist with extensive research knowledge in SSA agriculture. The support team comprised of trained and experienced engineers, agriculturalists, agronomists and a gender specialist. The gender

specialist played a critical role to strengthen relevance and quality of gender focused discussions.

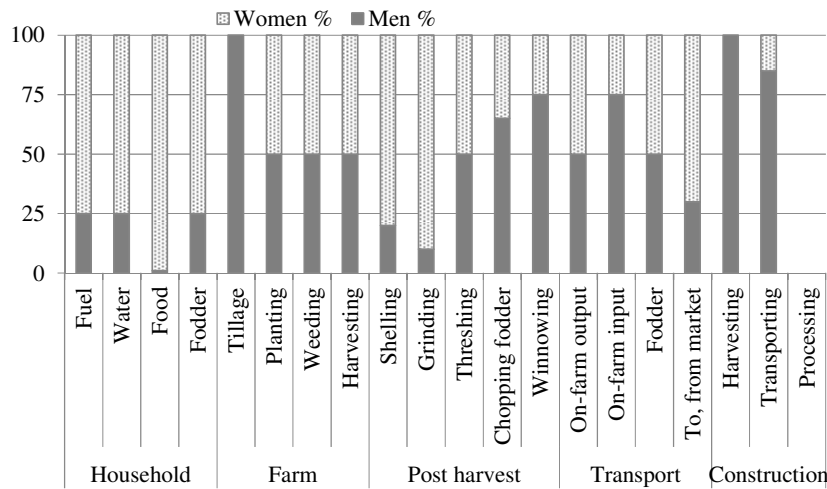
## Findings and discussions

### Findings

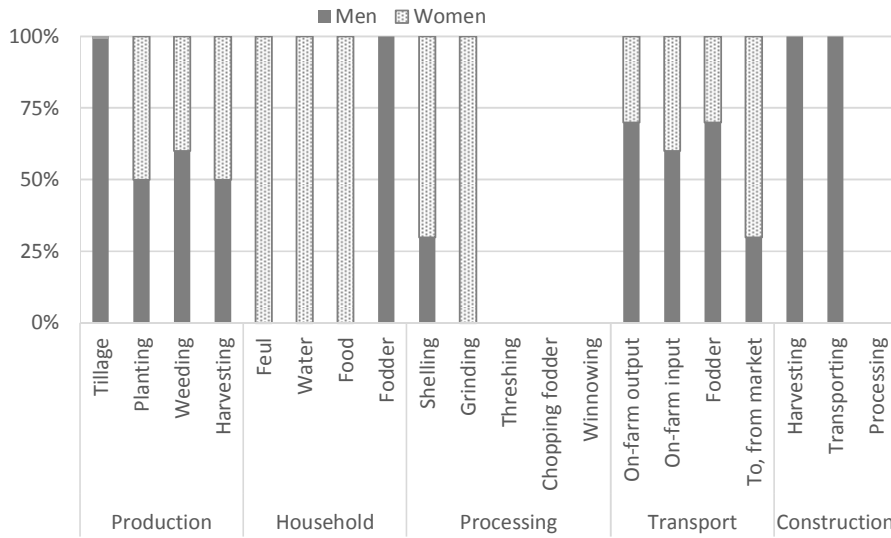
Patterns and trends were documented in frequencies, matrix charts and percentages. We have derived graphs and tables in our presentations for analyses.

#### Gender desegregated distribution of tasks

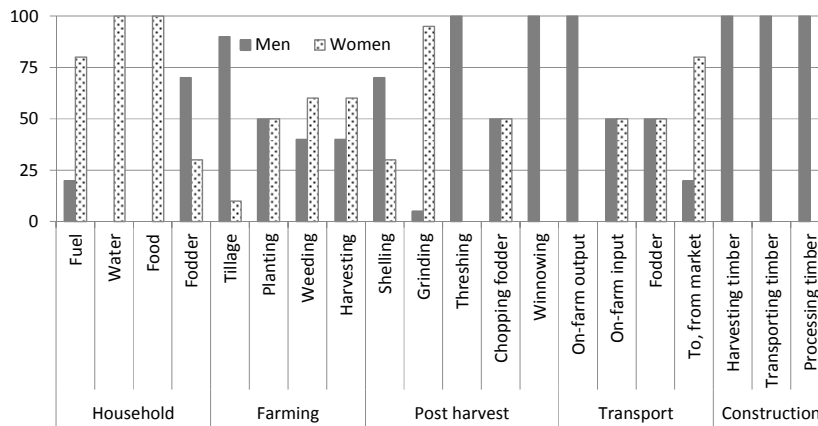
Results from both women and men-only FGD show that fetching water, preparation of food, and threshing of crops were almost exclusively done by women. In opposition, buying inputs, and selling or transporting produces (to the market) were largely shared among men and women as illustrated in Figure 1-4.



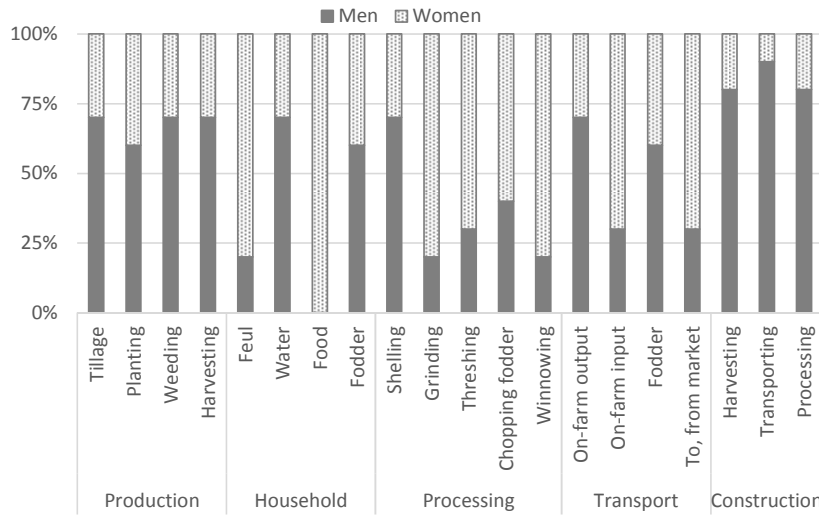
**Figure 1a.** Distribution of tasks among men and women at Hawassa Zuria, Dore Bofena – findings from the Women-only FGD



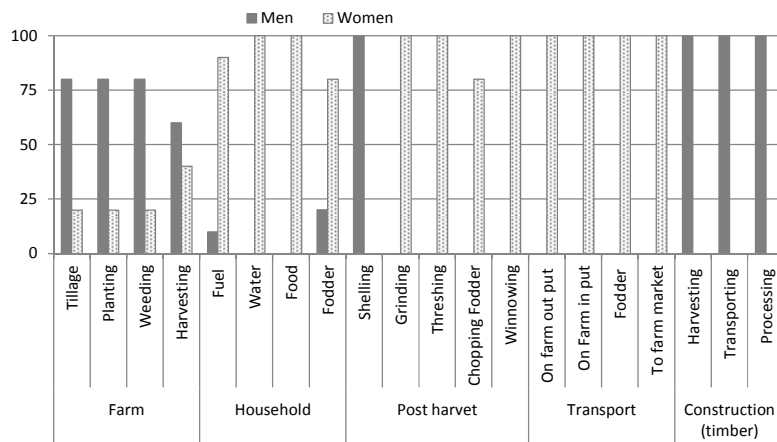
**Figure 1b.** Distribution of tasks among men and women at Hawassa Zuria, Dore Bofena – findings from the Men-only FGD



**Figure 2a.** Distribution of tasks among men and women – men only FGD findings at Wondo Genet



**Figure 2b.** Distribution of tasks among men and women – women only FGD findings at Wondo Genet



**Figure 3a.** Distribution of task-performances among men and women – findings from women-only FGD at Tulu

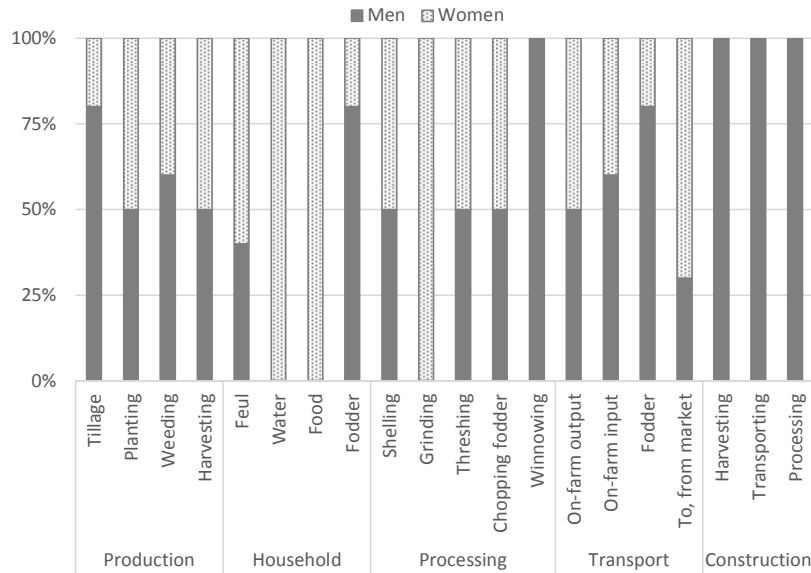


Figure 3b. Distribution of task-performances among men and women – findings from men-only FGD at Tulu

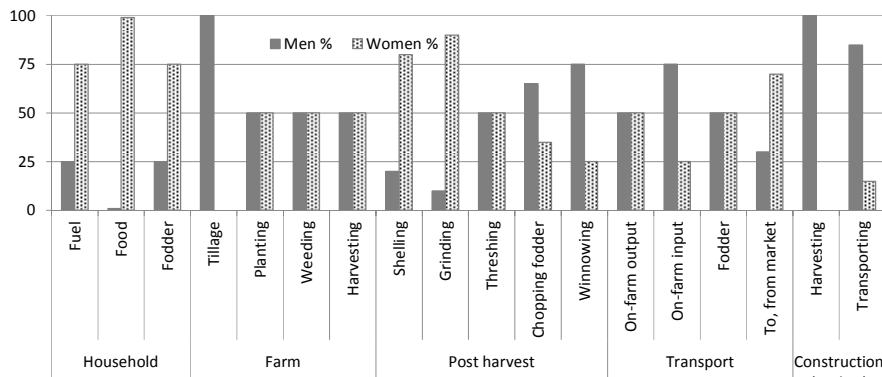


Figure 4a. Distribution of task-performances among men and women – men-only FGD findings at Dosh and Gora Silingo

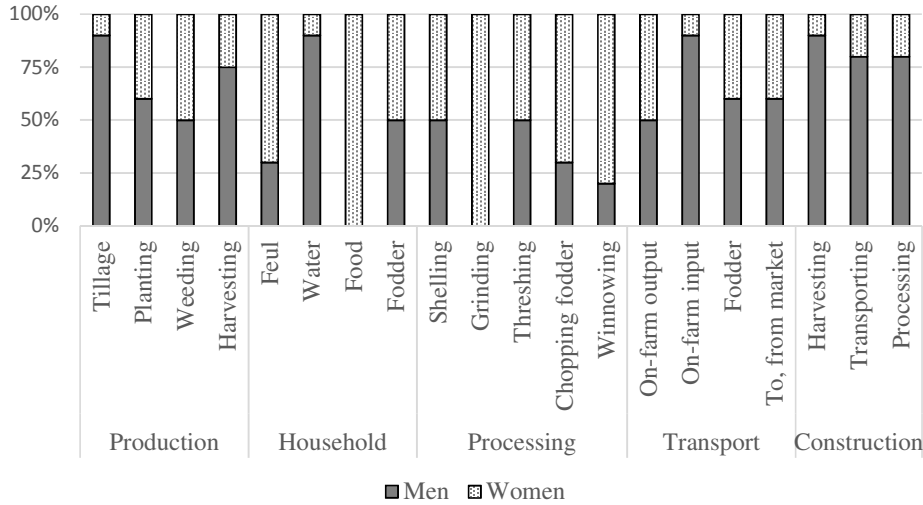


Figure 4b. Distribution of task-performances among men and women – women-only FGD findings at Dosha and Gora Silingo

An average of percentages from both men-only and women-only FGD show roughly 50-50 general distribution of tasks. However, an analysis of tasks performed predominantly by men and women reveal a completely different scenario. Women predominantly performed more tedious chores, such as fetching water, shelling, winnowing and threshing that were routine, time consuming or often solely carried out using human muscle – see Figure 1-4. In other words, these involved more drudgery.

**Common sources and ownership of farm power**

Figure 5-8 illustrates a pattern of higher use of animal in male dominated tasks. This confirms FGD findings and analyses that use of any improved equipment was among men, rather than women whose work was more routine and frequent.

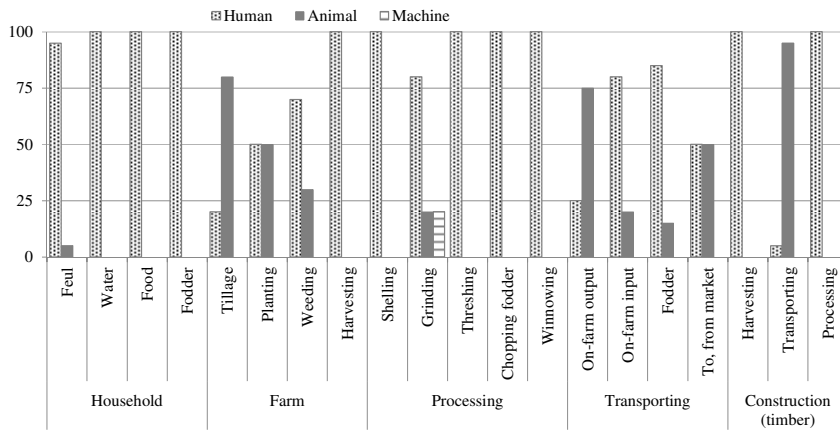
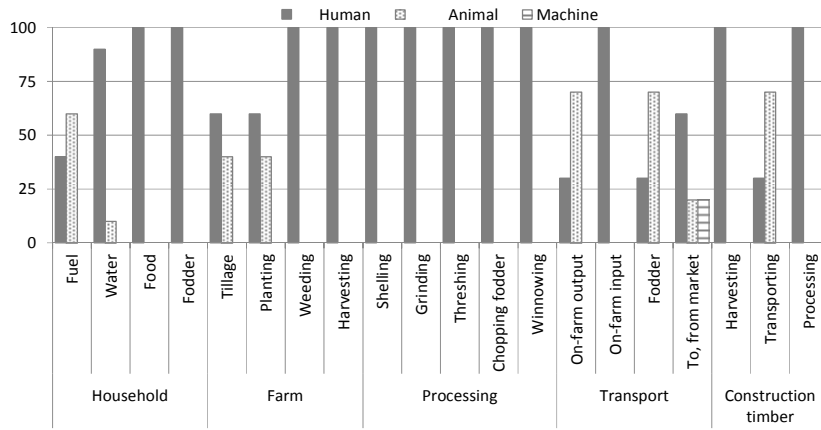
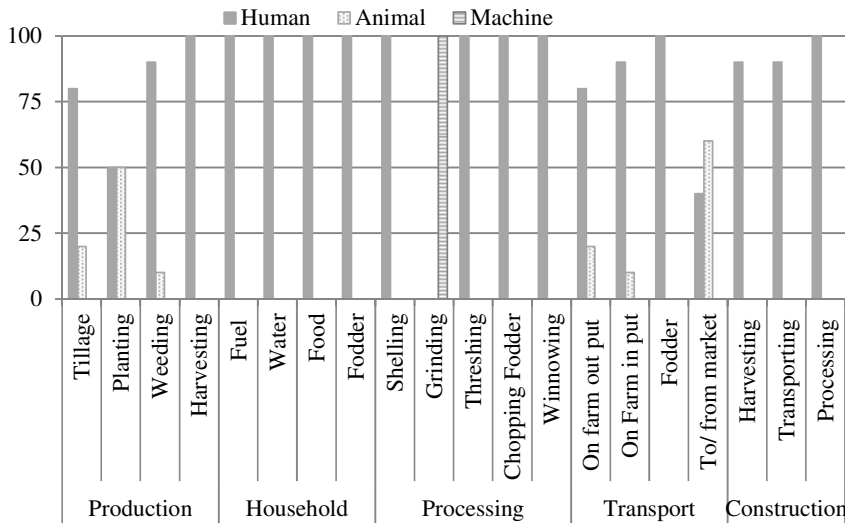


Figure 5. Distribution of sources of power – findings from women-only FGD at Dore Bofana

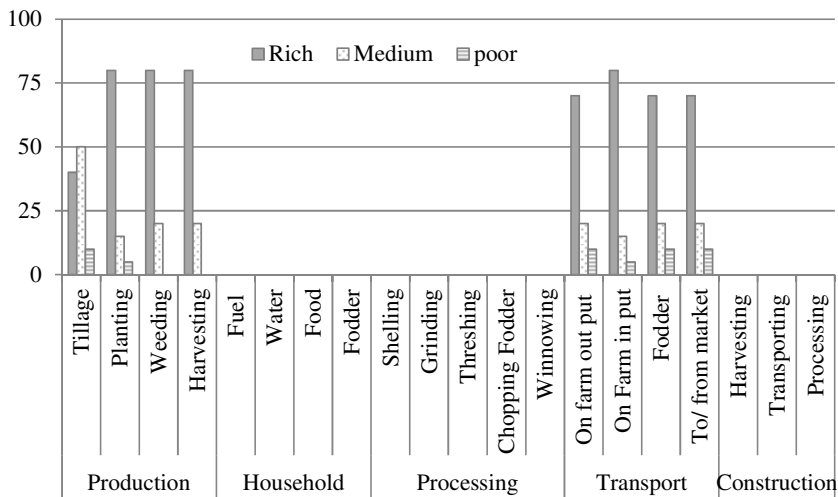




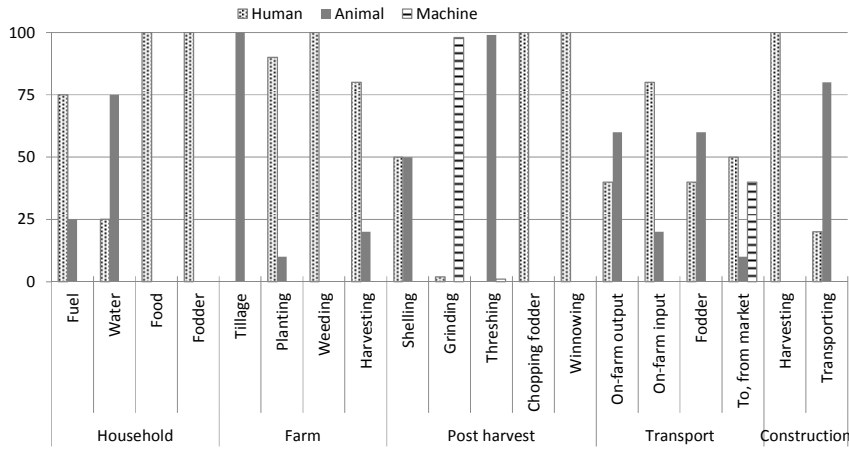
**Figure 6.** Distribution of sources of power – findings from women-only FGD at Wondo Genet



**Figure 7a.** Distribution of sources of power – findings from women-only FGD at Tulu



**Figure 7b.** Distribution percent ownership of corresponding power sources in fig. 7 – findings from women-only FGD at Tulu



**Figure 8.** Estimation of sources of power – men-only FGD at Dosha and Gora Silingo

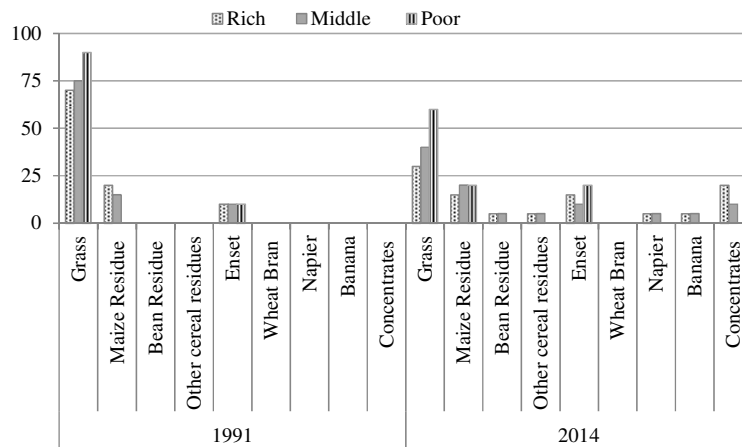
### Types of animal feed

Due to the critical importance of livestock in most rural Ethiopian economy, we sought to understand what farmers fed their livestock. We compared animal feed in 1991, and in 2014. The reference year 1991 was selected due to its political significance, and thus most farmers could remember what livelihoods were like then. Figure 9 shows that grass, which was critical in 1991, was less relied upon in 2014 compared to crop residue. In 2014, animal feed was more diversified, with richer farmers relying on more sources compared to the poorer households.

The purpose of focusing on fodder was to understand the changing value of animal feed, for instance if animal feed has become scarce and therefore more costly. Figure 9 illustrate how crop residue was playing critical role in 2014 compared to 1991 when grass was more predominant feed. FGD showed that with the increasing population, decreasing farm sizes, reducing common grazing areas, increasing school enrolment (less child availability to herd livestock) and changing patterns of climate, farmers were forced to rely more on crop residue. This was said to have negative consequences for the practice of CA. FGD participants also explained this meant keeping cattle was increasingly expensive, which may be useful catalyst for increased interest and demand for mechanisation. FGD discussions in all villages showed fewer farmers had enough oxen (compared to 1991) to form a ploughing set, and the need for cross-household oxen pooling had increased. In 2014 (compared to 1991) more households relied on well-wishers (esp. brothers, cousins, uncles, fathers) to plough family fields, based on both economic and social reciprocity. This model of social economy is fundamental, especially in shaping how ownership and use of machines are pursued.

Participants illustrated the need for households to be in a position to compare the economic returns/ costs between machine and animal. All FGD showed farmers will not widely embrace machine based solely on economy. The social reciprocity entrenched in culture, had more sway on livelihood trends. Therefore, participants preferred both machine (admired) and animal (known) power to be simultaneously promoted, because farmers would

only gradually find a balance that suited their unique economic model.



**Figure 9.** FGD findings on current types of animal feed by social class at Wondo Genet

### Understanding drudgery and preferences for mechanisation

Women perceived tillage, planting and weeding as the three most difficult tasks. They also ranked construction related activities as least difficult, especially because these were only occasionally done. And did involve combined efforts among men, including those hired or using better equipment.

**Table 2.** Perception of task difficulty among women in Dore Bofena

Task	Rank
Tillage	1
Planting	2
Weeding	3
transporting timber	4
processing/construction	5
collecting timber	6
harvesting farm produce	7

**Table 3.** Perception of task difficulty (drudgery) among women in Tulu

Task	Rank from most (1) to least (7) dreariest
Tillage	1
Weeding	2
Planting	3
Harvesting (crop and timber)	4
Shelling, transporting & processing (timber)	5
Threshing	6
Transporting on-farm output	7

**Table 4.** Perception of task difficulty (drudgery) among men at Haro Belalo and Shala Chebete

Task	Rank
Harvesting	1
Tillage	2
Shelling Threshing	3
Weeding	4

Transport	5
Planting	6
Timber/Construction	7

**Table 5.** Perception of task difficulty (drudgery) among women at Haro Belalo and Shala Chebete

Task	Rank
Harvesting	1
Construction	2
Planting, winnowing	3
Tillage, weeding, shelling	4
Food, on farm output, harvesting	5

**Table 6.** Reasons for prioritizing the mechanization of harvesting and tillage among men at Haro Belalo

Harvesting	Tillage
To improve grain quality	Due to ever increasing fodder Price
To ensure the task is finished in time	Increasing Price of Oxen
	Security (difficult to think of agri. Production without oxen)

#### *Common constraints identified in FGD related to mechanisation*

- i) Poor business orientations, for instance general perceptions that animal traction was cheaper or even more adapted to existing social, economic and environmental conditions. Indeed, animals played varied social functions. However, their economic and environmental costs were less perceptible, poorly visible, or not considered in long term implications for sustainability.
- ii) Increasingly decreasing farm size (about 1 ha) in the sites. This is principally caused by **Population** increases (Josephson 2013).
- iii) Nature of agricultural labour was changing due to the changing nature and quality of benefits (both on-farm and off-farm). The average age of farmers in the past 10 was reported to be about 45 years in all sites.
- iv) Cereal farming was mainly for subsistence or fetched lower incomes than horticultural enterprises. Mechanisation could therefore target both, by ensuring main staples are increased, while preferred or most promising income crops are integrated for complementarity in the household enterprises.
- v) Smallholders often did not belong to strong business groups or clusters. This lack of, or poor commercial clusters (including agricultural innovation platforms) that can facilitate *socially acceptable business models*, enhance use of research technologies such as CA, improved germplasm, is a key area that needs to be addressed. Social mechanisms to solving livelihood constraints were mentioned as critically vital among more than 90% of farmers who could not individually own 2WT, other machinery, or even CA-necessary equipment such as sprayers and planters.
- vi) FGD findings also indicated skills related to farm and off-farm mechanisation were low or non-existent. This included skills related to water handling e.g. irrigation equipment.
- vii) Findings also show farmer believed local fabrication would reduce prices or enhance suitability of equipment. This however would require identification and development of required skills.

## Discussions

### Gender, small mechanisation: toward an Ethiopian social economy

The FGD results in Ethiopia are very similar to the ones of the FGD in Kenya and Tanzania regarding division of tasks among men and women. There are clear trends, with women performing chores, especially those that are routine and most frequent. However, Table 1- 6 show that women prioritized tasks to be mechanized based on a complex set of criteria. First, they determined that a task is critical when it “opens” the way for other tasks. In other words, a timely and proper tillage is critical to ensure early planting, control weeds, and make planting easier. In reality, tillage is often hastily done, and women bear the brunt of weeding related drudgery. So the prioritization of tillage by women shows that women tasks are dependent on prior men. Second, harvesting was seen as critical, especially to avoid loss of yield in the field. In addition, mechanical harvesting and tillage would both reduce the need for women to travel frequently to men with food, if these can have multifunctional uses including hauling of carts.

An underlying aspect of gender and mechanisation is the cost, esp. because it is widely regarded as unaffordable for most households. If households would afford, however, men would be most likely the ones to own or acquire mechanization first. In other words, women prioritising men-dominated tasks illustrates how they considered mechanisation as a process that is likely to be “led by men”.

Many women regularly multi-tasked to cover more than 24 hours of work in a day, especially in households with young children. Percentages may show balances in chores, especially because farming is seasonal. However, most off-season chores that were male dominated involved animal draught power, handcarts and bicycles. This is not necessarily negative for gender dynamics, but rather we need to identify intra-household linkages among chores. We need to first ask whether we need to prioritise mechanisation of women tasks if we are to improve women welfare.

Prioritising what to mechanise is dependent on the context. Women-dominated tasks are ones that are mostly difficult to target. To mechanise such tasks as weeding, depends on such agronomic practices as planting in line. Setting the stage for mechanisation therefore is not mere entry of machines, but rather working to ensure basic agronomy is rightly practiced, involving men and women to ensure household work relationships evolve without creating conflicts.

It is evident machines and other new equipment will be shared among households. There is a strong social system based on sharing, on maintaining parallel monetary and non-monetary reciprocity. Profits are not seen in terms of cash in the immediate future, but rather they are regarded in terms of being able to collaborate for wider gain. This cuts across social status. Therefore, introduction of new CA equipment may not target a clear typology-based entry point. Instead, there has to be a mechanism to ensure locally suitable social economy – where social preferences, needs or constraints advise the type of approaches to mechanisation. For instance, in the Hawassa maize dominant and Assela wheat dominant systems, cooperatives, Saccos, marketing or input-acquisition farmer groups may be best

placed to partner with not-for-profit and business entities to engage the a sector that is public-sector led

## **Conclusion**

This study concludes that mechanisation among rural smallholders of Assela and Hawassa in Ethiopia cannot be merely about increasing machine numbers, but rather prioritising specific work activities, while seeking multi-functional equipment. Because livestock, especially donkeys and oxen are highly relied upon, and have a deeply entrenched social besides economic roles, there may be need to first seek appropriate equipment that may be hauled by these animals. And then gradually transition to mechanised power. Where possible, have equipment that may be interchangeably pulled by animals and small machines. To ensure gender sensitivity, multi-functionality of machines or equipment may be most appropriate in these smallholder circumstances that are characterised by small, highly fragmented and routine subsistence and economic chores.

## **Acknowledgements**

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