

The impact of mechanised groundnut shelling on gender dynamics in Malawi

Malawi Oilseed Sector Transformation Programme
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Executive summary

This study was carried out under the DFID-funded Malawi Oilseed Sector Transformation Programme (MOST) with the aim of assessing the impact of the introduction of mechanised groundnut shelling on gender dynamics in selected districts in Malawi. Based on this assessment, the study develops strategies to address key barriers to women's full engagement in groundnut processing and to increase or safeguard women's roles in mechanised processing of groundnuts. The study was conducted in 11 villages, seven in Mchinji District and four in Dedza District, all of which have some level of groundnut production activities, and all-but-one have had some exposure to mechanised groundnut shelling.

The study focused on hand-shellers that rely on manual action to shell as these were most widely available in the study sites, although a number of different types of groundnut shellers are available in Malawi.¹ The system examined involved smallholders accessing a sheller for a fee, either from a group or a private person, and carrying out the shelling themselves. This stands in contrast to business models that offer the equipment together with shelling and winnowing services as one package (toll shelling).

The study produced the following key findings:

Key findings

- 1. Women play an active role in all stages of groundnut production, but control of income generated from groundnut sales involves complex gender dynamics and is mostly dominated by men**

The study establishes that women are actively engaged at all stages of groundnut production and processing, from seed selection to selling. However, when considering the sales stage, there are often intra-household conflicts and negotiations over how the money earned should be used. This and other findings of the study suggest that, while women have greater control over groundnuts compared to other crops, such as maize and tobacco, this control is limited, especially regarding the control of income generated.

- 2. Gender division of labour when mechanised shelling is introduced:**
 - Men and boys operate the sheller**
 - Women and girls also operate shellers but to a lesser extent. They also winnow.**

The study found that, most commonly, men and children (mostly boys) operate the machines while girls and adult women winnow the groundnut chaff. No such winnowing is needed when the shellers are electric because most of the chaff is removed during the shelling process, and the rest is blown away.

¹ These shellers differ from those that have a handle or wheel to create levered force and shell through an indirect mechanical action. The key distinction is the use of manual power versus manual power and mechanically generated force versus non-manual power (motor) and mechanical force.

3. The introduction of mechanical shelling leads to a displacement of casual labourers (mostly women) who provide hand-shelling services

A considerable proportion of hand-shelling of groundnuts is carried out by casual labourers, who comprise mostly poor women. With the introduction of mechanical shelling, these labourers lose an important income generating opportunity. Since this group is already likely to be very poor, this displacement may have serious negative effects on their ability to meet basic needs and is likely to negatively affect overall development outcomes.

4. Women, in particular, experience difficulties in operating metal shellers and have preference for electric and wooden shellers

Particularly women reported that although they can use metal shellers, these are harder to operate, require more physical exertion. Wooden shellers were reported to be easy to operate by both women and men and are, thus, more women-friendly in terms of operation and use. For those that had experienced electric shellers they preferred these to either metal or wooden shellers, and electric shellers were the ones that were seen as the easiest to use for both women and men.

5. Ownership of shellers is dominated by better-off men so women and poor people in general lose out

The study found that most shellers are owned by NGOs or groups and the few private owners were all relatively well-off men. This suggests that the likely economic benefit from owning a sheller is among better-off men, rather than women or poor people, unless mitigating strategies are put in place.

6. Overall benefits of mechanised shelling:

- **Reduced drudgery, especially for women, because they dominate manual shelling;**
- **Reduced cost of shelling and greater volumes of sales of groundnuts leading to increased incomes;**
- **Rental income from shellers accruing to individual owners and also clubs;**
- **Productive use of time saved (potential)**

The main actual benefits of mechanised shelling are reductions in drudgery; reduced costs of shelling groundnuts since mechanised shellers cost less per unit compared to manual labourers; and for women and men who in addition to producing their own groundnuts participate in retailing it, increases in incomes due to rapid turnover of sales. Potentially, women and men can also earn incomes by renting out shellers for a fee. Currently however, only clubs and a few men that can afford investing in shellers have benefited in this way. Another potential but currently underutilised pathway to benefits is the productive use of the time saved as a result of mechanised shelling.

7. Overall negative impacts of mechanised shelling:

- **Loss of income of labourers who provided hand shelling services (most poor women)**
- **Women re-legated to supportive task of winnowing, not operating the sheller (potential)**

One critical negative impact of mechanised shelling is the loss of income by labourers who provide hand-shelling services, often poor women. Potentially, mechanised shelling, particularly using hand-operated shellers, can also have negative effects by relegating women to supportive tasks such as winnowing which are likely to be poorly remunerated.

- 8. Barriers to women fully capitalising on mechanised shelling:**
- **Women un-friendly design of shellers**
 - **Gender norms that further discourage women from operating shelling machines and re-legate women to supportive tasks**
 - **Lack of finance to purchase shellers to rent out or operate for a fee**

Key barriers identified that limit women's ability to fully capitalise on mechanised shelling include the prevalence of metal shellers, as opposed to wooden and electric shellers, which are difficult for women to operate as they require significant physical strength. This physical barrier is further compounded by gender norms that discourage women from operating machines and relegate them to supportive tasks, such as winnowing.

In addition, women are more likely than men to lack the financial capacity to purchase and own shellers, which could be rented out for a fee. While microfinance levels available to women would in some cases be adequate for financing hand-operated shellers, they are unlikely to be adequate for financing electric shellers. Yet in some areas close to electric power, electric shellers are the most preferred type of shellers and hand-operated shellers are becoming obsolete.

9. No overall displacement of women groundnut farmers as a result of introduction of shellers

Although at the household-level the introduction of mechanical shelling has led to men taking on a more dominant role in groundnut processing, possibly resulting in even greater male-control over income generated through groundnut production, this has not resulted in an overall displacement of women in groundnut production as the demand for groundnuts in Malawi is growing.

There is however a risk that in future, as the market becomes saturated, women, who typically have fewer assets than men, could be displaced. The driver for men entering groundnut production is, however, not necessarily mechanisation but increased demand for groundnuts, good market price, low inputs requirements and the low (price) dependability of tobacco – a crop that men have traditionally depended on for their incomes. Nevertheless, well-designed strategies to support women's participation in mechanised shelling can contribute to building women's market resilience.

Based on these findings, the study makes the following key recommendations:

Key recommendations

Recommendation 1: Promote women-friendly sheller designs

The study found that most respondents, particularly women, find operating the metal shellers available in their communities difficult to operate as they require too much physical strength. There is an overall preference for wooden, as well as electric, shellers. However, electric shellers have the added disadvantage that they require electrification, which is rare in rural Malawi. It is, therefore recommended, to consider promoting wooden shellers as well as metal shellers that do not require as much physical strength, such as those that have a handle or wheel to create levered force and shell through an indirect mechanical action.

Recommendation 2: Address gender norms to encourage women to operate mechanical shellers

In addition to the physical difficulty of operating some shellers, the study found an underlying gender norm that discourages women from operating shellers, leaving the task to men instead. The exact origin and reasoning behind this norm is, not doubt, complex and the report has not been able to provide an in-depth understanding thereof. However, it seems a critical contributing factor resulting in women being re-legated to supportive tasks in groundnut production through mechanisation. It is recommended to further engage with this norm to better understand it, as well as working with women's groups, to explicitly encourage women to carry out mechanical shelling themselves. Household methodologies should be used to stress the joint benefit of gender equality and women's empowerment to the household as such.

Recommendation 3: Promote toll model for shelling

Promote a toll model for shelling through which smallholders can bring their groundnuts to a sheller who has a machine and provides the actual shelling and winnowing service. Provided that the shellers are reasonably priced and easy to reach, this should enable female farmers to access the benefits of mechanised shelling without having to rely on male labour.

Recommendation 4: Link casual labourers who engage in hand-shelling to alternative income generating activities

With the introduction of mechanical shelling, casual labourers who engage in hand-shelling are likely to lose an important income generating opportunity. Since this group mostly comprises poor women and some men, this may have serious negative effects on their ability to meet basic needs and is likely to negatively effect overall development outcomes. There is, therefore, a need to link these labourers to alternative income generating opportunities.

Recommendation 5: Facilitate access to finance for women to purchase shellers

Where economic analysis shows business viability, female groundnut farmers should be supported by linking them to access finance, and supported to invest in shellers. For the most part, this will be realistic only with hand-shellers since electric shellers have much higher upfront costs. However, options for getting women to engage as co-owners of electric shellers should also be explored. This option is particularly viable in villages where there are no clubs that already own and hire out shellers to avoid immature competition, which can result into failures of either or both club-owned and women-owned shellers. To reduce the women's risk of high indebtedness resulting from the financing but also to capitalise on peer support, sheller ownership can be group-based.

1 Background and Rationale

1.1 Background to the study

The UK's Department for International Development (DFID) is supporting the Malawi Oilseed Sector Transformation (MOST) programme with the aim of reducing poverty by facilitating changes in the cotton, groundnut, soybean and sunflower markets through a market systems approach ('making markets work for the poor' – M4P). Groundnuts are seen as a reliable crop which requires fewer inputs such as fertiliser and pesticides, for example compared to maize and tobacco², and contributes to household incomes and nutrition. Increasingly groundnuts are becoming a cash crop and there is potential for export. Since women tend to have lower economic capacity to invest in farm inputs, groundnuts and its commercialisation represent an important economic opportunity for women.

Female farmers have traditionally played an important role in groundnut production in Malawi, resulting in much literature referring to groundnuts as a "women's crop".³ Indeed women in Malawi predominantly grow groundnuts, and are engaged in many of the postharvest processing including digging/lifting, drying, stripping and shelling for their own fields and for other farmers as hired labour. However, the extent to which women have actual control and decision-making power over all aspects of groundnut production, including sales and use of profits is questionable, which will be further discussed below.

Due to women's strong role groundnut farming, the crop presents an opportunity for women's economic opportunities and empowerment especially as the market grows. The processing of groundnuts in Malawi is however largely manual and is arduous which can deter production expansion. In addition, most farmers sell groundnuts with little or no value addition and hence obtain marginal benefits from its production, also stunting growth of the groundnut sector. High levels of aflatoxins are another barrier to growing groundnut sector in Malawi especially for the export market (See for example, Simtowe, undated; Exagris, undated). Adding value to groundnut production through processing is one the strategies necessary for facilitating the growth of the sector. Inputs to this value addition process include mechanisation of the groundnut value chain, which could be manual or electric. Part of MOST's strategy in Malawi is therefore to promote mechanised shelling of groundnuts in order to add value, increase returns, and reduce the risk of aflatoxins.

While MOST's strategy presents opportunities for groundnut farmers such as increased income from groundnut production, more time for women to engage in other productive and social activities, experience from other sectors shows that without understanding of gender dynamics including opportunities and barriers of any sector and especially in women-dominated sectors, increasing monetisation and mechanisation of sectors can reduce women's opportunities even if the sectors were previously women-dominated (von Braun and Webb, 1989; Mehti, Gandhi and Dilbaghi, 2012; Venter and Mashiri, 2007; Fisher, Warner, and Masters, 2000; Paris and Chi, 2005; Carruthers, 1985; World Bank, FAO, and IFAD, 2008). It is therefore important before extensively promoting mechanisation, to understand the gender dynamics of the sector and of mechanisation so as to understand the likely impacts of mechanisation on women. By knowing these gender dynamics,

² The comparison with maize and tobacco is selected because maize is a staple food and widely grown while tobacco is an important cash crop, providing over 60% of the nation's foreign exchange (Tchale and Keyser, 2010: 35).

³ Women's crops are defined by Doss (2001) as crops where women are the ones that not only control the output, but also choose the crops to grow and make management decisions.

strategies can be formulated to mitigate any negative impacts while enhancing the positive effects of mechanisation of the shelling process. In order to do this, MOST through Adam Smith International commissioned a study to assess the actual and potential effects on mechanisation on women in groundnut value chains. This document reports on the findings of the study.

1.2 A note on different types of shellers and shelling models

The market in Malawi offers a number of different types of groundnut shellers. The shellers analysed in this study are mostly metal and wooden hand shellers that rely on manual action to shell as these were most widely available in the study sites. These shellers differ from those that have a handle or wheel to create levered force and shell through an indirect mechanical action. The key distinction is the use of manual power versus manual power and mechanically generated force versus non-manual power (motor) and mechanical force.

There are also different ways that shelling services are offered in Malawi. Shellers can either be made available for a fee and clients carry out the shelling themselves, or the service offered is a combined package offering the equipment together with the shelling and winnowing service. This report focuses on the former system only.

1.3 Gender and farm mechanisation – what do we know and study rationale

FAO defines mechanisation as the process of improving farm labour productivity through the use of agricultural machinery, implements and tools. It involves the provision and use of all forms of power sources and mechanical assistance to agriculture, from simple hand tools, to animal draught power, and to mechanical power technologies. While theoretically, mechanisation presents opportunities for female farmers to be more productive as well as to engage in other productive and social activities where it reduces time poverty, experience shows that mechanisation can either benefit or disadvantage women. Indeed, studies looking at mechanisation of agricultural processes across various countries and crops have found that mechanisation can have positive, as well as negative impact on women, depending on the extent to which the initiatives were purposefully gender-responsive. This section provides a short overview of this literature.

1.3.1 Potential positive impacts of mechanisation on women

Reduced drudgery

Mechanisation of agricultural processes can reduce women and men's drudgery and work burdens reducing the time taken to perform specific tasks and the related hardships. Mwankusye (2002) found that the use of a wheelbarrow can reduce the time spent on water transport, and was appreciated for its multiple functions including transporting firewood, tools, crops, children and the elderly to health clinics. In Bangladesh, use of draught animal power benefitted women and children the most because they were traditionally responsible for the tasks it mechanised including weeding. Time taken to weed sorghum crop decreased from 157 to 34 hours per hectare, while weeding groundnuts decreased from 73 to 31 hours per hectare (DfID, 2001). Mechanisation of weeding also increased the number of men engaged in weeding, further reducing drudgery for the women.

Women's economic empowerment

In addition, mechanisation can, if carried out in a gender-responsive manner, economically empower women at various levels in the value chain. For example, a study by Mehti, Gandhi and Dilbaghi (2012) found that mechanisation of various field preparation and planting activities in India increased the use of female hired labour and thus increased income generation opportunities for poor women. The Mali Multifunctional Platform, a diesel powered engine that enables women to process grain and other produce, resulted in increased self-confidence as women were trained to operate these engines and because they earned incomes from operating the platform and charging a fee for the service (Sovacool et al, 2013). The project promoting the Mali Multifunctional Platform specifically targeted women by providing the technology (free of costs to the women) as well as supporting services such as marketing its services. Paris (2011) shows how women were empowered economically and socially as a result of mechanised rice milling leading to increased income, which also increased their self-esteem and improved their social standing. This was possible through a project supported by gender analysis in research and initiatives, engaging women in design and dissemination of technology, organising women in groups to own rice mills on entrepreneurial basis, providing financing for purchases of rice mills for the women's groups, and provision of training both on machine operation as well as on gender issues.

1.3.2 Negative impacts of mechanisation on women

Increased workload

In some cases, mechanisation has disadvantaged women and in some cases subsistence farmers in general. Mehti, Gandhi and Dilbaghi (2012) found that the adoption of new technologies increased the time inputs, in this case for both women and men. Thus, even though the same technology increased incomes as discussed above, it also increased time inputs showing that a single intervention can have opposing effects. This was because it added tasks that the farmers undertook. Venter and Mashiri (2007) show that various intermediate means of transport (such as donkey carts or bicycles) added more tasks, responsibilities and time burden for women compared to when they were less mobile.

Loss of control and income

In the Gambia, von Braun and Webb (1989) found that introduction of technology to improve rice production a traditionally female crop, increased men's involvement in rice production to the detriment of women's, with women's share of rice fields decreasing from 91% to 10%, and rice changing from being an individual crop controlled by women to a communal crop under male governance. Women then started engaging in farming crops that were less valuable than men, and less valuable than those they previously farmed. Fisher, Warner, and Masters (2000) find that the adoption of the stabling technique in rural Senegal improved milk production and profits but later on was taken over as an activity by men. In Mali, the Multifunctional Platform created some discord over gender roles as men resented women's new powers and in some severe cases harmed them physically for contemplating taking a part in the project (Sovacool et al, 2013).

Increased inequality between more or less poor smallholders

Mechanisation can also increase inequality not just between women and men but across economic categories. Paris and Chi (2005) found that when plastic drums for seeding were introduced to improve seeding efficiency in Bangladesh, it was mostly better-off households that benefitted while poor, landless women who were previously employed to plant seeds lost their jobs. Similar patterns have been observed when conservation agriculture has been introduced (World Bank, FAO, & IFAD, 2008). In Indonesia and Bangladesh, the increased use of rice mills displaced part time jobs for the poorest individuals including women (Carruthers, 1985).

Re-enforcement of negative or restrictive gender norms/stereotypes

Improved agricultural technology can also reinforce gender norms that have contributed to the disempowerment of women. In rural France, drawing on life-histories and ethnographic study of rural France, Saugeres (2002) shows how the introduction of the tractor reinforced rather than challenges gender divisions of labour and inequalities leading to male domination in farming in France, affirming patriarchal norms in agriculture even in the long term⁴. Brandth (1995)⁵ shows how images such as advertisement and pre-existing gender norms co-constructed notions that equated tractors to masculinity and in doing so, maintained men's control of tractors (and subsequently, the Western farm).

1.3.3 What makes the difference: When do women benefit from mechanisation

A critical question to be answered is why does mechanisation yield such different results? The literature analysing impacts of mechanisation on women shows a pattern whereby positive impacts result when programmes put in place explicit interventions to support **women's ownership of machines** (Paris, 2011; Sovacool et al, 2013), and when **technical designs are responsive to women's ergonomic needs** such as weight of the machines as well as their social status such as portability of rice millers (Paris, 2011). Enabling these changes in a sustained manner was in almost all cases cited above, catalysed by purposive efforts to build the interventions on a gender analysis and subsequently mainstream gender in the mechanisation process through, for instance, specifically **mobilising and working through women's groups**, purposefully targeting women for training initiatives, and facilitating access to financing (Paris, 2011; Sovacool et al, 2013).

Negative impacts were experienced where there were limited efforts to explicitly engage women or other marginalised groups (Sovacool, 2013; World Bank, FAO, & IFAD, 2008; Paris and Chi, 2005); when existing restrictive gender norms that, for instance, limit women's social ability to operate certain machines, are not addressed; and when alternative income opportunities are not available to those that previously provided manual labour and are being displaced by mechanisation (Paris and Chi, 2005;). In the case of commercialisation of the associated crop, negative impacts might be more complex since commercial value of the crop can displace women regardless of whether there is mechanisation or not (although the two often occur in tandem).

1.4 Study sites

The study was undertaken in Mchinji and Dedza, which were selected both purposively since they are groundnut growing areas and opportunistically because they were the districts on which information was available regarding the location of villages that had access to groundnut shellers. Efforts were made to include villages close to roads and trading centres as well as those that were far (outside typical walking distances that do not present excessive hardships) from such centres. This is because road networks and proximity to markets are known influential variables in both agro-economic activities and mechanisation.

In Mchinji, the research was conducted in seven villages, two of which were combined because they were very close to each other (Table 1-1).

⁴ To date, farming is largely seen as a male occupation in Europe with women being seen as farmers' wives or playing a supportive role only. It is likely that Europe's approach to mechanisation and other factors have contributed to this legacy.

⁵⁵ Brandth notes that "the men farmers give the tractor gender, and the tractor makes farmers into real men." (p127).

Table 1-1: Research villages, their locations and sheller use

Name of village	District	Proximity to major markets or roads by car (approx.)*	Shelling location	Types of shellers used
Kalulu	Mchinji	10 minutes/40 minutes	Mkanda EPA/ trading centre	P: Electric S: Hand operated
Kafere and Milioti	Mchinji	10 minutes	Mkanda EPA/ trading centre	P: Electric S: Hand operated
Nkhwazi	Mchinji	> 1 hour 20 minutes	N/A	Hand shelling
Chioko	Mchinji	15 minutes	Within the village and Chiosya EPA/ centre	Electric and Hand operated
Chimteka	Mchinji	15 minutes	Within the village and Chiosya EPA	Hand operated
Mwambula	Dedza	> 1 hour	Within the village	Hand operated
Kutsanja	Dedza	> 1 hour	Within the village	Hand operated
Chimatiro**	Dedza	10 minutes	Within the village	Hand operated
Ntengeza**	Dedza	10 minutes	Within the village	Hand operated
Kamgunda	Dedza	10 minutes	Within the village	Hand operated

* Major markets means either main market that several villages use and vendors come to, markets near an EPA or district centre/headquarters

**Chimatiro and Ntengeza are both under group village headman Lodyanyama (and are therefore sometimes referred to as hamlets of Lodyanyama) and are within 5 minutes' driving distance from each other.

Of these villages, only Chioko and Chimteka villages had shellers within the village, and in both cases the shellers were provided to clubs, free of charge, by NGOs. The clubs then charge users a fee for use. In Chioko, shellers were introduced by the African Institute for Cooperate Citizenship (AICC) while in Chimteka they were introduced by the Rural Livelihoods and Economic Enhancement Programme (RLEEP). Kalulu village depends on hand-operated shellers that are rented from other villages, and electric shellers from the nearby trading centre and from Mkanda. Kafere and Milioti villages largely depend on electric shellers from Mkanda trading centre but optionally, hand operated shellers from nearby villages. Nkhwazi village did not have any shellers but residents were very keen to participate in the research and it was added to the list of study villages and used to strengthen the understanding of barriers to the use of shellers (See also methodology section).

In Dedza, all study villages have hand-operated shellers within the village or in a close by village. In Mwambula village, and in Kutsanja villages, shellers were provided by RLEEP. In Kamgunda the shellers were provided by Concern Universal. All shellers in Dedza are supported, at least in part, by RLEEP. Of all villages, Nkhwazi in Mchinji, and Lodyanyama in Dedza appeared to be the poorest villages based on housing type and incomes reported. Nkhwazi was the furthest from any trading centre. All villages however had roads that were passable by vehicle even in the rainy season (albeit with some difficulty)

1.5 Methodology

This study used qualitative methods with focus group discussions (FGDs) as the primary method and complemented with in-depth interviews. The methods are detailed in the following subsections.

1.5.1 Focus Group Discussions

FGDs focused on community members in the following categories:

1. Female and male groundnut farmers who are using mechanised shelling;
2. Female and male groundnut farmers who manually shell groundnuts;
3. Female family members from households using mechanised shelling⁶;
4. Female family members from households that manually shell groundnuts;
5. Male and female labourers that engage in groundnut shelling

Table 1-2 details the sample size by location and sex of participants. Within each category, FGDs were conducted as either female only or male only in order to allow both men and women to freely express themselves.

Table 1-2: Composition of focus group discussions

Name of village	District	Number of female participants	Number of male participants	Number of FGDs	Shelling location	Types of shellers used
Kalulu	Mchinji	21	45	4	Mkanda EPA/trading centre	P: Electric S: Hand operated
Kafere and Milioti	Mchinji	17	15	4	Mkanda EPA/trading centre	P: Electric S: Hand operated
Nkhwazi	Mchinji	***	***	2	N/A	Hand shelling
Chioko	Mchinji	31	15	5	Within the village and Chiosya EPA/centre	Electric and Hand operated
Chimteka	Mchinji	20	10	5	Within the village and Chiosya EPA	Hand operated
Mwambula	Dedza	19	5	4	Within the village	Hand operated
Kutsanja	Dedza	35	23	6	Within the village	Hand operated
Chimatiro	Dedza	18	7	2	Within the village	Hand operated
Ntengeza	Dedza	14	2	3		
Kamgunda	Dedza	18	9	5	Within the village	Hand operated
Total		193	131	40		

***In Nkhwazi village, almost the entire village wanted to participate so, making it difficult to only interview a few. The encounter was therefore conducted as a village meeting. It comprised 22 males and 40 females. No demographic data was collected for this encounter.

It must be noted that for each village, some level of hand shelling persists. The mechanised shelling is most common in Kalulu, Kafere and Milioti where shellers have been around since about 2009. Of the villages with access to mechanised shellers (i.e. excluding Nkhwazi), those in Dedza had most persistent use of hand shelling. This is in part because mechanised shelling is new, having been

⁶ The term “female family members” was taken to mean female persons living in the household but not in a key decision making position. They were generally children of the household whether biological or not (fostered or adopted). The concept of a female and male groundnut farmer as it pertains to this research and its findings is further clarified in section 3 on page 37

introduced from around 2012, and because there are few or not privately operated shellers to complement those provided by NGOs.

In each village, participants were sampled using a mix of convenience and purposive sampling. The convenience strategy was used due to time limitations and because of a high number of disruptions during the fieldwork⁷. These disruptions also meant pre-recruitment sessions, which had been planned to be conducted before the fieldwork day to more consistently select participants were left to community leaders rather than the team doing this themselves.⁸ Purposive sampling was used because the study required specific information from the specific categories outlined above.

A topic guide developed before the fieldwork and reviewed by MOST's gender consultant was used to guide discussions focusing on the key issues that this study seeks to address. The topic guide included a section on informed consent, which reiterated the objectives of the study and the fact that participation was on free will and did not mean certain advantages (e.g. distribution of goods). Confidentiality and anonymity rules as well as the setup (such as recording of the discussions) of the FGDs were also explained and verbal consent sought before beginning the FGDs. No incentives were provided, other than refreshments at the end of the FGDs a token of gratitude. New questions were added as issues emerged in the field (e.g. comparing electric and hand operated shellers, asking views on gender).

1.5.2 Demographic characteristics of FGD participants

The study involved a total of 40 FGDs with a total of 324 participants (excluding about 80 who attended a community meeting in Nkhwazi village, 22 men and 60 women). Of these participants, 193 were female and 131 were male. Of the persons that participated in the FGDs, 73% reported that they were in male-headed households while 17% reported that they were from female-headed households. Another 10% were from households that were headed by both the male and the female. 74% of the participants were married, 15% were separated, 8% were divorced, and 3% were widowed.

The average age of female participants was 33 (with median of 32) while the average age of male participants was 41 (with median 40). The majority of the participants reported that farming was their primary source of income (85% of the males and 91% of females). Other primary sources of income were piecework (11% of males and 6% of females). Microbusinesses were common secondary sources of income, with women dominating snack businesses while men engaged in carpentry, retailing of food and groceries. Both women and men also depend on piecework for secondary incomes. Formal employment was very rare for both females and males.

⁷ The fieldwork coincided with the first rains (and hence planting) as well as the arrival of subsidised fertiliser which meant many households were busy with agricultural activities. There was also a funeral in one village (Nkhwazi village) which delayed fieldwork. In another village in Dedza, fieldwork was cancelled because there was such a crowd at Mayani market for people attempting to buy FISP fertiliser. According to various sources, one child died and four people were hospitalised after a stampede when tear gas was used to control the crowd. Sources reported that this was a second death related to efforts to get fertiliser in the area. They also reported that women were being disadvantaged because they were less likely to bribe to get fertilisers, less likely to spend a night in open air waiting for fertilisers and that when there are stampedes they and children are more likely to be injured. Women's child care duties are also an impediment to them spending a night at FISP fertiliser purchasing point (in an effort to be among the first to be served).

⁸ The timing of the study was in rainy season at the beginning of the planting season and community members were busy preparing fields and in many cases had to spend hours or days attempting to access fertiliser distributed through the Farm Input Subsidy Program (FISP). This made making appointments difficult and so the idea of using a recruitment form on one day to return subsequent days to conduct FGDs and KIs was abandoned. Instead, key gate keepers in the communities were asked to arrange the participation by making announcements or randomly identifying participants.

It was problematic to estimate monthly incomes since incomes from subsistence farming are often irregular but also because some participants were unable to estimate their spouses' incomes. However, a picture that emerges is that the majority of the respondents between 0 and K5000 per month.

Table 1-3: Reported monthly incomes*

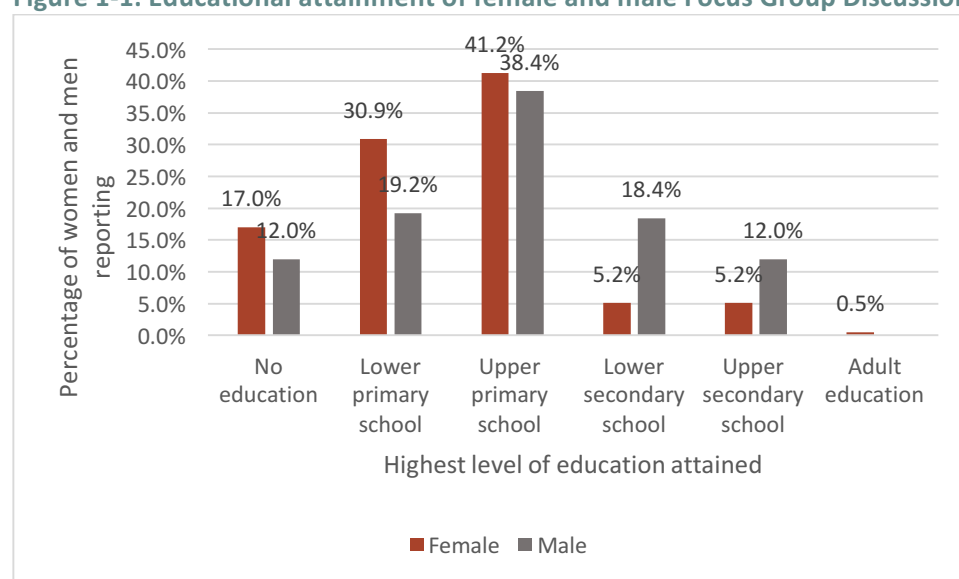
	Women	Men
Monthly income (MK)	Total (% of all women reporting)	Total (% of all men reporting)
0 to 5000	76 (54%)	33 (31%)
5001 to 10000	23 (16%)	15 (14%)
10001 to 20000	13 (9%)	12 (11%)
20001 to 50000	15 (11%)	20 (19%)
50001 to 150000**	13 (9%)	26 (25%)
	140	94

* The incomes reported are a mix of one person's incomes or a couples' incomes since

** These incomes were more seasonal incomes and before debts for agricultural inputs are taken into account

Women had lower levels of education than men and the pattern of education suggests that girls are enrolled in school but dropout as they progress to higher classes since women outnumbered men in the education categories of lower and upper primary school but are outnumbered by men in the secondary school categories (Figure 1-1)

Figure 1-1: Educational attainment of female and male Focus Group Discussions participants



Women in FGD tended to report lower groundnut yields compared to men, with women's groundnut harvests at median of five to six bags compared to men whose median harvest is seven to 10 bags⁹. As Figure 1-2 shows, women dominate the lower production categories (up to 5 bags, and the category 6 and 10 bags).

⁹ The median was selected due to the huge influence of outliers on either end of the dataset. For example, for women, in women's FGDs, the lowest amount of harvest reported was half a bag while the highest was 60 bags. For men the lowest level of harvest was also half a bag while the highest was 70 bags. Arithmetic means therefore presented a distorted picture of harvest levels.

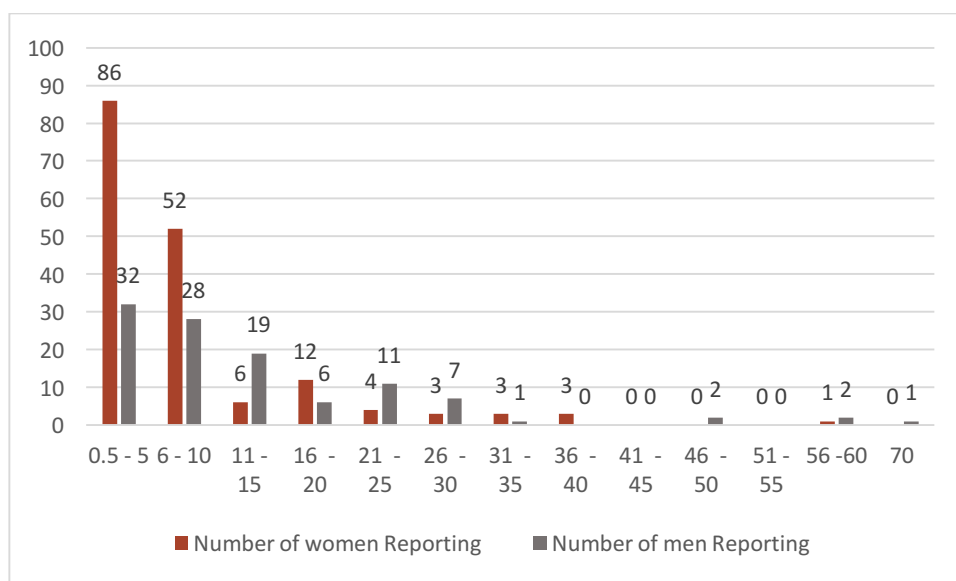


Figure 1-2: Bags of groundnuts harvest reported by women and men in FGD

1.5.3 Key informant interviews

Key informant interviews were of two types. The first were those held with household members, typically a wife or a husband¹⁰. The second type was that held with key agricultural advisors and coordinators in the area and these are also referred to in this report as expert interviews. For household KIIs, a total of 15 were conducted of which nine were with women including two girls (aged 16 and 17)¹¹ from groundnut farming households, and six were with men.

Among the 15 KIIs, three KI considered themselves as being from couple-headed households (i.e. households headed by both female and male, in partnership), two were from female headed households and 10 from male headed households. The average age of respondents was 41. None of the 15 KII had agricultural equipment to reduce labour, other than traditional hoes and slashes. Interestingly, of the 15 KIIs, nine had mobile phones in the household and only two women had had mobile phones (in one case it was being repaired at the time of the interviews). This suggests that men have better access to technology and communication in particular than women. The two women who had had mobile phones were both from couple-headed households.

There were six expert interviews including five agricultural advisors (village level persons such as club chair persons and village extension multiplier) and one project manager. Two other interviews were done opportunistically at a groundnut shelling point and these included the operator and the customer, and another opportunistic interview was conducted with a female buyer of groundnuts (and other produce)¹². The household interviews allowed for an examination of household based dynamics on groundnut shelling while expert interviews were focused on getting the experts' perceptions on mechanisation process.

¹⁰ Initially the plan was to interview a husband and wife separately. This was not possible because only in three cases were a man and woman found at home at the same time.

¹¹ One was in school and the other had stopped schooling because she became pregnant. Based on the age of the child, it was estimated that she was 14 when she became pregnant.

¹² She runs the business together with her husband.

1.5.4 Data analysis and management

For the FGDs, one transcript per category (female farmers, male farmers, young female and male members of groundnut farming households) was selected at random and these were analysed and manually coded to create the initial coding template. All other transcripts were coded to this template. New codes were added to the template as they emerged. Themes were developed first across gender then per technology group (whether manual, mechanised electric or mechanised hand operated) and then these were compared across groups to identify unifying and distinguishing themes. Theoretical constructs and narratives were then developed and used to re-examine the questions in the research and their answers. For KIIs, interview guides were coded and categorised and analysed, then cross compared with codes from FGDs. Finally, the evidence from the literature was used where relevant to interpret the findings.

1.5.5 Study limitations and interpretation of the findings

The first key limitation came about in recruiting. The initial plan was to recruit individuals of various categories days in advance of the fieldwork day. In part because the rains, which were late in 2015, started the day we started fieldwork, it was often difficult to recruit persons for various categories since village residents were out in the field, planting, or at market centres trying to purchase fertilisers. Advanced recruitment was therefore abandoned as it was slowing down the process and FGD members were recruited through village announcements made by chiefs and agricultural clubs personnel. Related to this challenge was then the issue of trying to select female-headed households only to be an FGD category. When this was attempted, only one or two women would turn up for such a category and so we ended up combining women from female headed households with those from male headed households. This actually had benefits in that within each group, female and male headed households could debate dynamics of each household, enlightening certain aspects of the study.

The study depends on self-reported data from participants and informants. Given that in many cases research on development triggers hope of assistance it is possible that certain issues were overstated in the hope of getting development support. This is especially true in the case of incomes. Also in interpreting incomes there is need to understand that since the women and men in the sample do not earn stable monthly incomes and do not collate their incomes or expenditures over time, they are often unaware of their actual income. Further, when married women and men report incomes, they are not necessarily reporting total household incomes but rather they are reporting what they earned because husbands and wives are often not fully aware of each other's earning. Self-reporting also always has "response bias" limitations whereby participants provide what they feel are the "desired" answers even though they are told that there is no right or wrong answer.

Last, the study only focused on shellers and shelling models available in the study areas and did not include toll shelling or shellers that have a handle or wheel to create levered force and shell through an indirect mechanical action, which have largely been promoted by MOST.

2 Context

2.1 Gender norms, values and their impacts on agricultural production

This subsection outlines the prevailing gender norms and values in the study areas in order to provide the context in which mechanisation occurs. The focus is on outlining the perceptions and prevailing practices with respect to women and decision-making, resource ownership and control, and economic empowerment.

Although there is increasing awareness about equality between sexes, such equality is at times seen as dangerous for family life and at other times, misrecognised (e.g. as helping women (only) if they are not available to do “women’s work”). Appendix 1 is a more detailed discussion on the prevailing gender perceptions and prevailing in the area.

Groundnut shelling it is still seen as women’s task except when remunerated or when a machine is used, in which case men start getting involved. When men get involved without pay it is young boys or, if at home, it is done in short bursts of activities without full commitment. Asked why groundnut shelling is a women’s tasks, the following reasons were given:

- It is carried out close to home and the home is a woman’s domain while men go out to earn incomes;
- It requires sitting for a long time and men cannot do this because they are restless;
- Because groundnuts are women’s crops and not men’s.

In terms of decision-making, participants said that increasingly, men discuss their decisions with their wives before implementing them, compared to the past when women were rarely consulted. However, men largely remain the key decision makers. During KII, 13 out of the 15 interviewees were asked about who makes a range of key decision and while there are some decisions that are made jointly in general, the majority are made by men as Figure 2-1 below shows.

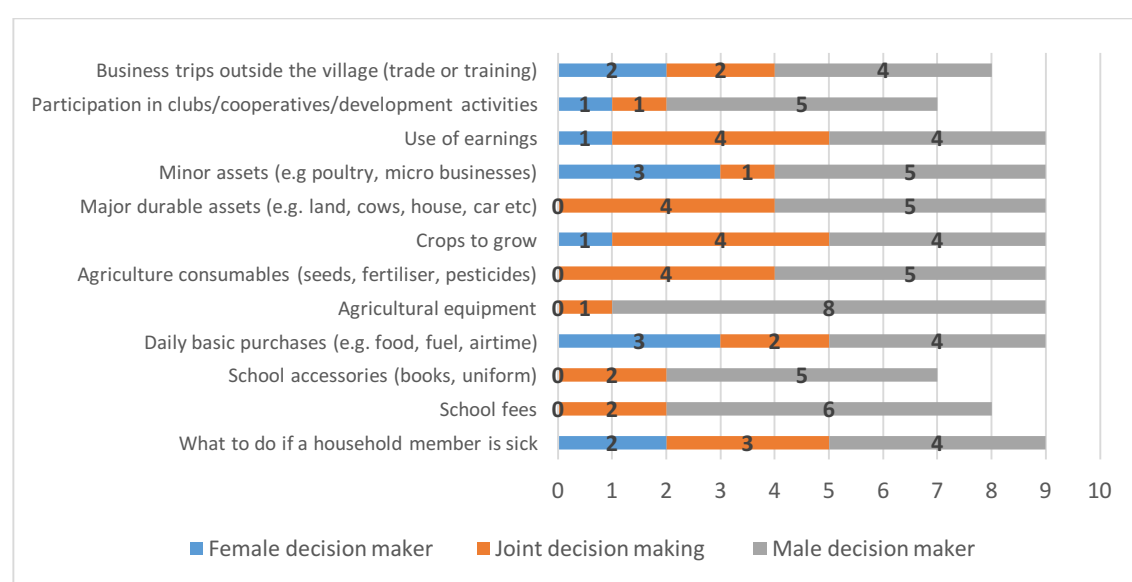


Figure 2-1: Gender division in key decisions (n=12)

When households without a husband are removed from the data, nine households of key informants remained. This subset of data shows that there are two decisions that women are

likely to make and these are decisions on daily basics (what to cook, eat, etc.) and making purchases of minor assets such as poultry and micro-enterprises. In both decision-categories three women reported that they are the ones that make these decisions. Joint decisions were most likely to occur in cases some in the family being ill (3/9 participants), as well as agricultural consumables such as seeds and pesticides, what crops to grow, major durable goods such as buying land and houses, and how to use earnings in general (4/9 households in each case). Above all, men were most likely to make the decisions regarding the purchasing of agricultural equipment (8 of 9 households). The decisions about the paying of school fees was also dominated by men – reported in 6 of the 8 households that had school-going children.

Other key decisions that were made by men were purchasing of school accessories such as books and uniforms, agricultural consumables (seeds, pesticides, etc.), major durable purchases, purchasing minor assets, and decisions on whether or not to participate in development activities and whether or not a woman can travel outside the village for business. All these cases, five of the nine households with husband and wives reported that it was the man who made the decision or had the final say. However, three women reported that although the man had the final say, they reported to him as a matter of informing him and that he would not refuse them permission to travel or participate in development clubs.

Another aspect that participants and KIIs reported has not changed much is earnings and opportunities to earn (and with it economic power), citing that men have more income earning opportunities and actual incomes than women. This was reported by both women and men. This was largely attributed to men's high mobility. Both women and men reported that women's limited mobility is a key barrier to their income generation capacity both in terms of opportunities and levels of income. Women however pointed out that increasing their mobility is good for income generation but would also be in conflict with their roles as mothers. Working around the home, they argued, enables them to look after their children as they work.

An interesting finding was that most of the men in the FGDs did acknowledge that women experience a high level of work burden and often have no time to engage in income generation. In particular, they reported that women's reproductive work such as caring for children, managing homes, firewood and water collection etc., are a huge burden for women and disrupt their engagement in agricultural activities.

One gender structure that is historically common between Mchinji and Dedza is how marriage is governed which in turn affects women and men's access to and control over resources and, decision making. Both Mchinji and Dedza Districts are traditionally recognised as matrilineal – termed *chikamwini* - and matrilineal districts. However, in tribal groups that practice matrilineal and matrilineal customs in Malawi, there is an option for patrilocal setups called *chitengwa*¹³. The FGDs and household KIIs showed that there is a social change that is occurring, particularly in Mchinji where most married couples are entering *chitengwa* arrangements. The occurrence is so

¹³ Matrilineal societies are defined as societies that trace their descent through mothers and mothers' side of the family. In many matrilineal societies such as among the Chewa in Malawi, societies are also matrilineal meaning after marriage the couple and their families reside in the home village (locale) of the woman (wife/mother). *De jure* inheritance is also through females. Patrilocal and patrilineal societies are the opposite of matrilineal families, tracing lineage and inheritance to fathers and male descendants. In reality, the practice is more complex. In Malawi for example, the advent of cattle, the Nguni, Christianity, colonisation and modern economic structures are said to have modified matrilineal societies, shifting power towards men (Holden and Mace, 2003). Additionally, among matrilineal societies in Malawi, the maternal uncles (also termed female fathers) are considered guardians over their nieces and have a say primarily on their nieces' marriages but also on inheritance.

high that the majority of the participants in 6 of the 7 villages in Mchinji reported that they are largely chitengwa villages. This change is said to have started about 10 years ago:

“Over the last 10 years we have just preferred to do this because we felt that we men were losing out. You invest years in your wife’s village and when you are chased out, you leave with nothing.”

Men’s FGD, Chimteka II Village, Mchinji

Women FGDs also confirmed that this change had been occurring over the last 10 to 15 years and one woman implied that there is little consultation with the elders on this change and that for the majority of the cases, it is the men making the decision to adopt a patrilocal practice and not women:

Yes, this has happened. Now you don’t even give a chance. Today they marry and the next day, he has taken her to his village

Women’s FGD, Chioko village, Mchinji, 2015

In comparison participants in villages in Dedza reported that they remain largely matrilocal. Thus while women reported that they are experiencing changes in levels of empowerment mostly due to knowledge brought through NGO channels, they appear to be losing material forms of empowerment that existed through customary structures which provided tangible and economically valuable assets however limited these were.

2.2 Gendered access to agricultural land and finance, and use of income

2.2.1 Who farms where?

Among couples (married participants) the majority of both FGD participants and KIIs reported that they farm their plots together (but not necessarily control use of crop equally) regardless of the crop, with the exception of tobacco, which was typically farmed by men, and in many of these villages, groundnuts which is considered a woman’s crop.

There are two ways in which women and men farm or own plots together and yet focus on different crops. The first is intercropping by either planting one crop with another on the same ridge or dividing a plot in sections of different crops. This is often done for small-scale farming and for groundnuts and is being discouraged by extension advisors according to the participants. A more common approach for households that have more than one plot is to plant one crop per plot. In the KIIs, 10 informants reported farming on more than one plot. Of these, three considered themselves to be headed by both (couple-headed) husband and wife, two were female headed, and five were male headed. Of those with a single plot, four were male headed while one was female headed (See also Appendix 1).

However, the majority of FGD participants pointed out that when a husband and wife farm on different plots, it is often a result of intra-household (marital) conflicts. In cases of separate plots, the dynamics of *chikamwini* and *chitengwa* appear to come into play because in Mchinji, over half of the FGD participants reported that men have bigger plots than women. One reason that was given for women having smaller plots was that brothers purposely give them a smaller piece of land:

“As a man, you give your sister a small portion of the land you inherit from parents because you say to yourself, she will get married and her husband will also give her a portion of land and support her. Sometimes the husband does (give her a portion of land) or she gets divorced. So this is why women have smaller plots than men.”

Male participant, Chimteka village FGD

The above quotation illustrates the *de facto* power that men, whether husbands, fathers, or uncles, have even in matrilineal and matrilocal settings. Few women are able to challenge this power especially when they are in their natal homes and have support, some level of intangible empowerment, or if they justify their need for bigger land (or other resources), often on the basis on the man’s failure to economically provide for the family mostly due to alcoholism (See Appendix 1)

2.2.2 Who has access to finance

Another recent change that is modifying gender norms is the increasing availability of microfinance. In general, microfinance institutions prioritise women in accessing loans enabling them to invest in micro enterprises. This trend is observed not just in this study but also globally as observed by the Women’s World Banking (WWB). The WWB, in a review of 28 countries and 39 institutions, showed that women comprised 73% of clients (Women’s World Banking, 2013: p7). Of the 15 HH KIs conducted 10 had had access to loans, of which 70% were women and 30% were men.

The higher levels of access to finance among women shown above (Table 1-2) is a direct result of NGO interventions that specifically target women. However, sometimes women have to ask their husbands for permission to get loans. Amongst the women interviewed for this study, three reported they had to negotiate while three others were able to decide on their own. Men have fewer opportunities for accessing finance and sometimes use their wives as a conduit to do so.

Loan amounts among respondents ranged from K1 000 taken by a woman to pay for fees to K50 000, taken by a couple to start a business. The most common loan amount was K10 000. Almost all loans were repaid at an interest rate of between 15% and 20%. Women tend to use their loans for micro, snacks-related businesses, while men have a wider range of businesses including investments in agro-economic activities, bicycle purchases, stocking a welding shop and retailing of second hand clothes.

2.2.3 Use of farm incomes

In both the sites in Mchinji and those in Dedza, there is a gender division of economic responsibilities, which has important consequences on asset accumulation, economic empowerment of women and agency (decision making and autonomy). Women in general use the incomes from the sales of produce to purchase food, fertilisers, renting plots, clothes for children, pay primary fees and funds, groceries, buy school supplies and kitchen utensils (pots, plates, mats etc.). Men, on the other hand, spend their incomes on fertilisers, houses, radios, bicycles and motor bikes, paying for secondary school fees and starting businesses including, at times, providing capital inputs for their wives’ businesses. Other than these essential items, ‘luxury items’ are also purchased by both sexes. For women, these were said to be getting their

hair done and buying the latest fashions and occasionally going for tea at tearooms while for men it is often drinking or supporting girlfriends, and spending on tea at tearooms¹⁴.

2.3 Importance of groundnuts

In Mchinji more than in Dedza, groundnuts are produced commercially at a higher level and there is an established market. In contrast, the groundnut market is relatively young in Dedza and most FGD participants and KII interviews had only farmed it commercially over one to three years/seasons.¹⁵ This was confirmed in interviews by club coordinators as well as the Dedza field coordinator for Concern Universal. Indeed, in Mchinji farmers reported producing as much as 70 bags of 90kg each, and some men especially in Kalulu, Kafere and Milioti villages reported that they had abandoned tobacco farming in favour of growing groundnuts on a commercial basis. The fact that groundnuts are grown on a more commercial basis in Mchinji appears to be changing the gender dynamic of their production as men are becoming increasingly involved in groundnut production and reported that it is no longer considered a ‘women’s crop’. This is further reinforced, according to the participants, by climatic changes, which have made tobacco – previously the main cash crop, less viable. Women also acknowledged that more men are now engaged in groundnut production but reported that this is not a problem since there is increasing demand for groundnuts and that men earning incomes from groundnuts can have a beneficial effect on households.

Regardless of the production levels of groundnuts in Mchinji and Dedza, groundnuts are an important crop for households in both areas. It is an increasingly important source of income which women and men use for purchasing a range of items and it is also key to nutrition. Men, but more importantly women, see its importance as part of a balanced diet as well as a coping strategy (i.e. coping with an unending diet of basic vegetables) when animal-based protein is not available. Groundnuts in form of *nsinjiro* (powdered) and *chiponde* (peanut butter) are added to vegetables and porridge to improve their taste and nutritional value, used for production of oil at household level¹⁶, and as a snack in form of roasted or boiled groundnuts.

“For us women, groundnut is very important. You can use it when you don’t have good relish, or for children’s porridge. You get and sell some. You can even buy fertiliser with money from groundnut.”
Woman, Kafere/Milioti village FGD

Table 2-1: Prices for common crops in the study villages

Crop	Average lowest price (MK/kg)	Average middle price (MK/kg)	Average best price (MK/kg)
Groundnuts	300	550	750
Soya	100	220	160

¹⁴ The issue of drinking tea was especially important in Dedza. Women often classified husbands as being bad husbands based on their inability to buy them tea or take them to tearooms in the village or when the men go and drink tea but do not take their wives with them. Tea was one of the major sources of conflict between wives and husbands and appears to symbolise a “good, modern life”.

¹⁵ For both districts, the year before (2014-2015) had been among the lowest harvest with some harvesting a bucket or less due to poor rains, and additionally in Mchinji, due to peanut rust (*Puccinia arachidis*).

¹⁶ Participants pointed out that commercial oil production is not viable because 4kgs of groundnuts are required to make one litre of oil such that even disregarding all other inputs, a litre of oil produced this way costs 3-4 times what a litre of oil would cost in grocery shops in the area.

Maize	50	100	160
Sunflower	5	10	20

Finally, groundnuts are seen as a way to provide employment to the poorest in the villages, something households were proud to be a part of:

The thing about groundnuts is that they don't just help us. By producing groundnuts, we are also able to help fellow residents who lack the most because they can be employed to shell the groundnuts and if you have a lot, to harvest and collect the pods. So you help them earn a little from your own little

Employment from groundnut production is largely centred around shelling although for bigger fields, it can include tilling and weeding. In Mchinji where groundnut production is high the shelling and selling season can last from June to April the next year i.e. 11 months, with most of the labour for shelling used in the first three months. In Dedza, few households use shelling labourers and when they do, the season is much shorter, often from June to August and October.

In order to establish **women's roles in groundnut production and processing and the extent to which different parts of the production and processing process are remunerated** (objective 1 of the study), the relevance of groundnut shelling to women, and the gender dynamics around groundnut production, FGD participants were asked who the key persons – by sex – involved at specific stages of groundnut production are. There is some gender division of labour that dominate seed grading, planting, and drying, while activities such as seed selection, land preparation, and weeding, of groundnuts are done by both women and men, with exceptions involving households where groundnut production is seen as a woman's activity in which case, women dominate all stages of production (Figure 2-2).

Stage	Seed selection	Seed grading	Preparing land	Planting	Weeding	Harvesting	Drying	Shelling	Selling
Reported participation	Women and men	Mostly women	Women and men	Mostly women	Women and men	Mostly women	Mostly women	Mostly women	Negotiated and contentious

Figure 2-2: The participation of women and men in various stages of groundnut production

Figure 2-2 illustrates the complications of control over crop production, and shows that gender dynamics are complicated, often with deviations depending on the quality of individual relationships as women and men themselves asserted during FGDs.

When any stage of the groundnut value chain is remunerated, men join in including in the stages that are traditionally seen as women's work such as shelling. Importantly, participants reported that there is no different in the pay (per unit output) between women and men. At the sales stage of groundnuts, women in particular reported that this is wrought with conflict and negotiations because men want to take over. In discussing the gender dynamics of stages of groundnut production women in both Mchinji and Dedza repeatedly used the allegory of courtship saying that, figuratively, there is love and flirting (being in love, holding hands, winking at each other etc.) at all stages except at sales. This allegory was used to describe the unity that exists between husbands and wives at all stages of agricultural production (not just groundnuts) but breaks down when the crop is ready for sale and men want to take control of the sales. This

stage is so contentious that there were many accusations of theft (mostly women accusing men but also some men accusing women).

Even for households where husband and wife produce different crops, women and to a lesser extent, men, reported that men try to take over the incomes women earn even from 'women's crops' but often refuse to share their own earnings. Although many of the activities for the production of groundnuts and other crops are done in a joint manner, there are differences in the types of crops that women and men focus on.¹⁷ In all villages, women reported that they focus on groundnuts, soya and sunflower, and in the case of Dedza villages, they additionally focus on beans and cow peas. Men focus on tobacco and maize. In Dedza, men additionally focus on paprika¹⁸. However, being in charge of the production of particular crops does not automatically translate into control over the associated incomes. Some women still had to ask for permission to spend the earnings from "their crops". Women's lack of control over crops is even more pronounced in the case of 'men's crops' even when the husband and wife worked together on those crops:

For my crop we can both use and sale. For groundnuts, I do not ask for his permission because it is my crop. I can sell a portion and use it and when he is back, explain it. But for his crops, maize, tobacco or paprika, I wouldn't even dare to take any. Even if I farmed with him. Not even in an emergency
Women's Manual Shellers FGD, Chioko Village, Mchinji

The exception in terms of dominance of groundnut value chains were the villages in Mchinji particularly in Kalulu, Kafere, Milioti villages, Chimteka and Chioko where men have high levels of involvement in groundnut production. They reported that they started engaging in groundnut production because prices at the market are high, inputs are lower and so groundnut is currently the most profitable crop among the array of crops grown in their areas.

Interestingly women reported that the entrance of men in the groundnut market has not disadvantaged them because it is not a saturated market and even more groundnuts are needed. Some women even saw this as an advantage because the money earned from groundnuts, which are sold locally (either to vendors who buy from home or at nearby trading centres) is more likely to contribute to household welfare than crops such as tobacco which are sold at the auction floor in Kanengo, Lilongwe and women have little knowledge on prices. In addition to knowing little about the prices of tobacco, those women who reported that it is an advantage for men to engage in groundnut farming justified this by saying, compared with groundnuts, husbands often spend much of the money earned from tobacco sales before they return home.

¹⁸ As pointed out earlier, women and men can farm or own plots together and yet focus on different crops either through intercropping (with each of them concentrating on 'their crop' or through or when a land holdings two to three plots, and the husband and wife plant on different plots. Even this case, they might help each other with some tasks but largely focus on 'their crop' and plot.

3 Impact of mechanised groundnut shelling on gender dynamics

In this section the findings answer the questions on the positive and negative impacts of mechanised groundnut shelling on women. The discussion below starts with a general overview of the types of mechanised shellers that women and men used in the area.

3.1 Types of mechanised shellers in the study areas

The fieldwork identified three types of mechanised shellers; electric shellers, metal hand operated shellers and wooden hand operated shellers. Only very few electric shellers were present in areas close to trading centres where there is electricity and were found only in Mchinji (but not in Nkhwazi village) and not in study villages in Dedza. In areas with electric shellers, manual shellers were also accessible, often by renting from other villages nearby however, participants showed a clear preference for the electric shellers even when they complained that power cuts were too frequent. The reason for the preference was that there were the *fastest* and did not require physical efforts from the farmers themselves.

Critically, the metal and wooden shellers analysed differ from those that have a handle or wheel to create levered force and shell through an indirect mechanical action. The key distinction is the use of manual power versus manual power and mechanically generated force versus non-manual power (motor) and mechanical force.

Respondents across the board complained that hand operated shellers were exhausting to operate and caused shoulder and back pain, with two women reporting that the pain is so bad that after shelling two to three *burundis* (90kg bags), “*you have to search for indocid [a pain killer]*”:

It (hand operated sheller) is very hard. You get pains in the chest and your shoulders and the back feels like it is breaking. By the time you shell two or three bags, you stop and get indocid because of the pain. I told myself “never again!”

Woman, household KII, Kalulu village, Mchinji

Another woman, who was head of her own household echoed this sentiments:

To me, it doesn’t matter whether its wooden or metal. They are both *umphawi* (poverty/severe suffering due to lack of options). May be those with husbands can find something good in it because the man, if he is helpful can help them operate it. It is not hard but it is exhausting. My son could help me but most of the times he is at school or socialising with his friends so I prefer to take my groundnuts to the electric one. It is just a touch of a button and within minutes all is done.

Woman, household KII, Kalulu village, Mchinji

An opportunistic encounter with an electric groundnut sheller and the interview undertaken with the operator and a user that were present was enlightening on the operations of an electric groundnut sheller. First, based on the experiences of both the operator and the user, it confirmed the popularity of the electric sheller with users and operators. The operator reported that during the peak season for groundnut shelling, they operate almost 24 hours a day because

the area does not have enough electric shellers and demand for it is very high. As such they had installed an electric bulb where shelling operations occur to enable night time operations.



A groundnut shelling station. A bulb has been removed but is reinstalled at night during peak season

According to both the operator and customer using the electric sheller at the time of the interview, there are only four electric shellers in the area (in the villages surrounding Mkanda trading centre) and all of these do robust business throughout the year:

You see, even now this is December yet we still have customers every day. This will continue until the peak season starts again and then you should come. You will find people everywhere here. Even villages as far as Chibvala village, they hire vehicles or ox-carts and bicycles to bring their groundnut here.

KII – Electric Sheller Operator, Mkanda Trading Centre, Mchinji

In some FGDs and at the shelling point, the participants were asked what the estimated distance was from the furthest villages that use the shellers. Both estimated that people are willing to travel as far as 15 to 20 km to access an electric sheller even when hand operated mechanical shellers are present in their villages or in villagers that are closer by. This is further substantiated by FGD participants who reported that they do hire oxcarts, vehicles and bicycles to go to electric shelling points even if there is a hand operated one nearby. This shows that there is strong preference for electric shellers.

Metal and wooden shellers were found in both Mchinji and Dedza Districts. FGD participants and KI who had experience in using both metallic and wooden shellers reported that the metal shellers are harder to operate as they need more energy (tend to be stiffer) than the wooden ones. According to one club chairman in Mayani EPA (overseeing Lodyanyama and Kamgunda), metal hand operated shellers were being abandoned in favour of the wooden ones because the latter are easier to operate:

The wooden ones are easier to operate so even women like them because they can easily operate them and even a child can operate them. It is just like child's play.

Man, KII. Club Chairperson, Dedza

This assertion was further confirmed in FGDs – all FGDs participants except one that had experience of both the metal and wooden ones reported that metal ones were more difficult to operate as they required the operator to exert more force.



Hand operated metal shellers at Machichi Cooperative in Mchinji

Women and men also reported that as a result of difficulties to operate, of the hand operated shellers, wooden shellers were more women-friendly than metal ones and (for those with experience of electric shellers) electric shellers were the ones that were the friendliest to operate for both women and men in terms of use.

Of course if it (hand operated sheller) was given to us for free we would receive it but most of the [shelling] business would go to the electric one. So don't say *[to another participant who had expressed they would only want electric ones]* we only want electric ones but the electric one would be good. There is already a building we know that we women can use. It has electricity so they can easily connect the electric sheller.

Kafere/Milioti Women, Mechanised Shelling, Mchinji

The technical skills required to learn to operate as well as to maintain equipment can be a factor in abandonment of technology. However, all FGDs reported that no specialist training was required although in five villages (Chimteka, Chioko, Chimatiro, Ntengeza, and Kamgunda) but that some users had been trained through demonstration by the NGOs that introduced the shellers in 2014. Both women and men pointed out that in most cases one can just explain or observe the operations and then start operating the shellers whether mechanical or electric. Even disassembling both the metal and the wooden sheller was said to be easy.



A partially disassembled wooden sheller in Dedza

All FGDs reported that the shellers are so easy to operate that in the case of demonstrations on how to operate, only one hour or less would be needed. This indicates that technical skills are unlikely to act as a key barrier to women using the sheller. Table 3-1 presents the summary of advantages and disadvantages of manual shelling as stated by FGD participants and KIs

Table 3-1: Advantages and disadvantages of hand shelling

Advantages	Disadvantages
<ul style="list-style-type: none"> You do not get broken groundnuts You grade (quality check - select and discard rotten ones and ones that are not viable) the groundnuts as they are shelled You support fellow villagers or youth by employing labourers 	<ul style="list-style-type: none"> Time consuming and slow You get sore hands, blisters and fingers bleed You get musculoskeletal pains including lower back pain High losses due to mishandling and eating by labourers More expensive than mechanised shelling Takes away study time from children especially girls and free (mostly sports) time for boys Disrupts household chores especially for women Delays sales and cannot be depended on when cash is needed urgently Costs of shelling must be covered immediately

For electric powered mechanised shelling the main advantage was that it was fast while the main disadvantage was that groundnuts break during the shelling. Other advantages and disadvantages of mechanised shelling are provided in Table 3-2.

Table 3-2: Advantages and disadvantages of mechanised shelling

Advantages	Disadvantages
<ul style="list-style-type: none"> Saves time No physical assertion required (electric shelling only) Men help with shelling leaving women to focus on other work/relieving women's work burden Is cheaper than manual shelling using hired labour Facilitates rapid stock turn over because you shell and sell in quick succession 	<ul style="list-style-type: none"> Breaks groundnuts which can affect market value or value as seed Damages groundnuts due to soaking nuts before shelling after which they do not germinate (electric and metal)¹⁹ Increase risk of seed unviability due to soaking which damages the heart of the nut (i.e. the plumule and the radicle) Skin comes off after which the nut is not viable as seed or for sale²⁰ New tasks of winnowing and grading are added (Although these tasks are much less time consuming than hand shelling).

¹⁹ Soaking is said to be required when shelling groundnuts with metal and electric shellers.

²⁰ The explanation given was that once the skin comes off, when it is planted there is no control in how water reaches the germ? Of the seed and so it does not germinate or it rots in the ground



The research team tries out the wooden hand operated sheller in Dedza

As stated earlier, of all the advantages stated by participants the main disadvantage of mechanised shelling was that it crushes groundnut kennels. Since breakages was the most-often cited disadvantage of mechanised groundnut shelling, the research attempted to get a sense of the proportion of the breakages. Visual explanations from FGDs put the breakage rate at between 15% and 25% of total shelled nuts, and less for electric shellers depending on how long the nuts were soaked for. An agricultural programme manager from Concern Universal reported that for wooden shellers that the estimated breakage rate was less than 10%. For electric machines, we depended on observation of one shelling session and estimate that breakages were less than 2% of the total amount of groundnuts shelled. As with the FGDs, the customer at the shelling point, as well the operator pointed out that losses increase if the groundnuts are soaked for too long. How well the machines were constructed was reported to be another factor in the breakage rate in the case of hand operated shellers²¹.

From a gender perspective, another disadvantage of mechanical shellers – whether electric or hand operated - is that in terms of ownership, they are all owned and/or controlled by men (even those that are provided to clubs by NGOs). All four electric shellers in Mkanda were privately owned and were owned and operated by men. Although clubs have female membership – often outnumbering men – when we asked gate keepers of these clubs (to introduce us to the villages) only in the case of Mwambula village in Dedza was there a female in charge. The rest were males implying a power skew towards males.

²¹ Wooden machines' grooves are important to ensure free movement of the machine while for metal ones the size of the holes in the sieve were important. Also the metal machines are said to sometimes overheat and it turn heat the groundnut kennels causing the skin of the nut to come off which lends it unviable as a seed and not attractive for sales.

Despite some of these problems, the shellers are largely seen as beneficial and there is a high demand for them. At least one woman said she considered buying one herself and was charged K48,000, a sum she could not afford. Both women and men who used mechanised shellers requested that they be supported with more shellers .

The main thing is that these are good developments. That is why we always have people queuing for them and we write them in a book. We have to rent the shellers on a first come first service basis because there is too much demand. It becomes like a maize mill here when shelling is in season

Male FGD participant, Chimatiro Village, Dedza

Also speaking on the high demand for the shellers, Chioko chairperson reported that they have one sheller, which is expected to be used by all association members as well as non-association members that might want to borrow it. He said this means that it takes a long time for the sheller to reach all persons that would need it and an ideal situation would be one sheller per club. From the above advantages and disadvantages, we further analysed key benefits that have specific gender implications for women. These are discussed in the following subsections.

3.1.1 Time savings from shelling groundnuts with machines

The most common advantage of mechanised shelling that was cited was the time saving,s which are substantial even when winnowing and grading are taken into account.²² According to participants' estimates one person can shell one *burundi* (90kg bag) of groundnuts in five to seven days if the person does no other work other than shelling groundnuts, or three persons can take three to four days. When combined with some household tasks (but not field farming activities or going to the market) they estimated that groundnut shelling could take up to ten days or more. The latter scenario is the most common since women in particular still have to fulfil other household tasks as they shell groundnuts but also because of finger, wrist and back pain experienced from hand shelling groundnuts, which requires breaks in between shelling. In contrast, the participants reported that an electric sheller takes 10 to 15 minutes to complete a 90kg bag with no physical effects on the farmer, while hand shellers take between an hour and two hours for the same amount. Thus shellers reduce time spent on shelling by between five and nine days per *burundi* bag (and slightly less for 50 kg bags). Given that most women in Mchinji harvest an average of 5 bags per growing season, and taking estimate of five to seven days at eight shelling hours a day means shellers spend 200 to 270 hours per year, hand shelling groundnuts. With machine shelling this would be reduced to 5 to 10 hours a year, a saving of 195 to 260 hours or five to seven days a year saved (assuming an 8 hour working day). The actual savings would probably be four to six hours less when transport time is taken into account. In terms of time savings, it is women who manually shell their households' groundnuts that would benefit the most since when shelling is done at home, it is them that do most of this.

When asked what the 'saved time' is used for, most women use it for other work resulting in a less laborious day for them. No one reported starting a new business as a direct effect of reduced shelling time but those that are engaged in businesses reported having more time for businesses. Specifically, those that buy and sell groundnut reported a more rapid turnover of their stock (See section 3.1.3). The benefit of rapid turnover in groundnut businesses were cited

²² These two tasks are not required when hand shelling, since kernel and chaff are separated during the shelling processing.

by both women and men. However, the most often cited use for saved time was engaging in more agricultural activities. It is crucial, if women's lives are to be transformed, that the 'saved time' be used for productive, human development or respite otherwise it is likely to be filled with yet more drudgery (from other types of household work).

It was reported that girls use any time saved for other household chores and study while boys use it mostly for study and sport. Girls are less likely to use their 'saved time' for sporting activities because the gender context in which they live requires that they performance a broader range of household chores than boys, and perceive activities such as sport as luxuries, unnecessary or even inappropriate for adolescent girls but good for boys. It must however be noted that in all areas it was not unusual to encounter girls married or with children at the age of between 16 and 19.

3.1.2 Cash savings

Most households use hired labourers in addition to own domestic labour, with approximately 80% of households in Mchinji and 50% in Dedza hiring labourers to support hand shelling of groundnuts.

	Shelling cost range per 50kg (K)	Shelling costs range per 90kg
Machine shelled	K750	K1000
Hand shelled	K80/pail ** ²³ K500	K1200
Machine shelled	K10/Kg (club members), K20/Kg (non members) K200 (club members), K300 (non-club members)***	
Electric shellers	650-750	K1000

*For Chimatiro and Ntengeza villages

**One bag is filled by 6 to 7 pails

***This was said to be the beginning price to attract users

Taking women's median annual yield which was 10 bags of unshelled groundnuts, and with modest labour savings K250 per bag, shows that by shifting to mechanised shelling women's incomes (due to saving on cost of shelling) from a season of groundnut production can increase by MK1250 which when spread over 12 months is equivalent to a 1.5% increase in their monthly incomes.²⁴

Farmers and especially women however see the savings as going beyond cash:

The thing is because the shellers [labourers] are at your home the whole day, you are not expected to just pay them. You also make lunch for them. So on top of that money (we pay them), you should add the cost of relish and flour. You are taking the very little food for your household and giving them. So these machines are a real saving.

Women mechanised sheller, Chioko Village, Mchinji

Other than cooking for hired labourers, women must be around throughout the shelling period to supervise which delays other work commitments.

²³ In Kafere village, some labourers have reduced their charges in an effort to get farmers to continue hiring them.

²⁴ On average women reported their income/expenditures to be an average of K8000, ranging from K800 per day to K40,000.

3.1.3 Changes in incomes patterns and marginal increases in income

A number of households are both groundnut farming and groundnut trading households. These do not only farm groundnuts for sale but also act as vendors, “bulk” buying groundnuts and selling them on. In most cases, it is men who are in charge of this (in part due to women’s limited mobility and capital constraints) but women also engage in groundnut vending and according to one such woman, their numbers are increasing. For these women (and men) they say another positive impact of the shellers as rapid turnover of stock:

Before, you bought the groundnuts and waited until shelling was done and then sell then wait again. So your earnings are not frequent. With shelling machine, I take my groundnuts to the sheller and sell, by afternoon am already home and buy more and the next day I sell. So it is not that the price is better but you are selling, buying and selling again. So you can easily pay for things because you have money more frequently

Mechanised shelling, Women FGD, Kafere and Milioti villages, Mchinji

Thus mechanised shelling, by allowing a large amount of groundnuts to be shelled in a short time, also allows for a rapid turnover in stock. This means that cash is available more quickly to meet income needs of households. For women, this is especially important because as both women and men stated in discussions on gender (see section 2) women who have fewer income generation options compared to men and hence having more frequent income significantly improves their economic condition. Others see the rapid turnover in stock as an opportunity for business growth since they are conducting more business than before.

3.1.4 Easier payment modes and use of cash

Other than being cheaper, respondents also reported that terms of payment are easier for machines because their owners either have other sources of incomes or because the mechanised shellers belong to clubs. As such they often make arrangements to pay for the shelling after they have sold the groundnuts and even in instalments. For electric shelling payment is made immediately but so are sales because there are vendors at the shelling points or the owners of the shellers also trade in groundnuts. For electric shelling, which is only available at trading centres, women were especially appreciative of these arrangements and cited a number of reasons including:

- They did not have to go looking for buyers which is especially disadvantageous to women because their mobility is limited due to transport, child care and time constraints
- They are not at the mercy of vendors who come to buy from their homes but offer lower prices or even cheat them (being mobile, the vendors have a weaker relationship with the sellers and hence lower incentives for a fairer exchange)
- Since they get their cash when already at the market, they use some of it to buy necessities especially “nice food” (often cited as meat or small dried fish) for children. This means they do not have to make separate trips which could require negotiations with husbands or reorganising household chores

3.1.5 Impact of shellers on gender dynamics in groundnut value chains

Have shellers increased or decreased women's participation in groundnut value chains? Have they encouraged the participation of men to the detriment of women's traditional participation in value chains? For most areas under the study, it is difficult to determine the impact as mechanised shelling has only been used for one to two years. The area with the longest experience with mechanisation of groundnut shelling is Kalulu, Kafere, and Milioti where electric shelling has been around since 2011 and hand operated mechanical shellers from around 2009. To answer these two questions, we examine changes in gender division of labour in groundnut shelling as well as reasons for men's entry into groundnut production.

As pointed out earlier, in the absence of mechanised shelling, women undertake the bulk of hand shelling with the exception that when the shelling is remunerated as in the case of hired labour, men get involved although women still dominate hired labour. With the introduction of mechanised shelling, groundnut shelling becomes more of a shared responsibility and men become involved even when it is not remunerated, as do children. For electric shelling, both women and men get involved primarily as users while for shelling using hand operated mechanical shellers, girls and boys, and men are often engaged in the operation of the machine especially in the case of wooden shellers, which are considered easy and "like child's play". Women's roles in the shelling stage however do not disappear but largely shift from shelling to winnowing the groundnuts. Winnowing is an additional task that comes about with hand operated mechanical shellers but is not required in the case of electric shellers where left-over chaff is removed by simply pouring the groundnuts from a height and it is blown away—something that men do as much as women (whoever took the groundnuts to the sheller). In contrast, men never use a winnowing basket (since they never learn to because it is a "woman's job"). Thus mechanised shelling creates some shifts in gender division of labour but is still along gender lines in that women still do "women's work" i.e. winnowing, and men focus on machines which is also a traditional gender pattern (i.e. machines are typically considered the domain of men).

It must be noted that hand operated shellers, whether wooden or metal, need two to three people to operate: one pours whilst the other operates the jig in the case of the metal sheller, for wooden shellers, one pours whilst two people operate the jig in a to and fro motion. After shelling the nuts, winnowing and grading are required. Men and women felt that since the operation of the jig requires more physical exertion than pouring and/or winnowing, men tend to operate the jig while women pour and winnow.

So far this change in gender division of labour does not appear to have had a negative impact on women, in part because both women and men have some level of access to the shellers although men appear to dominate its operation. NGOs, most of which have some level of gender mainstreaming in their programmes, facilitate access to most of the mechanised shellers, but appear to have less of an impact in women's control of the technology. In dominating the operation of the machine, men assert their privileged position as 'managers of technology' (and in this way mechanised shelling marginally reinforces gender norms). However, women are relieved of drudgery of both hand shelling as well as mechanised shelling from shellers (though to a lesser extent since women also operate hand operated shellers). It is likely that gender norms that suggest that technology is a male domain, and the novelty of the machines are the reasons why men dominate the operations of the machines. In addition, because dominance of men in operating the sheller itself, women might not be seen as (competent) operators of the machines which is a disadvantage when such positions are remunerated.

3.2 Impacts on female labourers

The research identified three groups of persons that shell groundnuts for cash (as labourers): adult women and men, youth (males and females that are teenagers or in their early 20s), and girls and boys. Youth and children shell groundnuts to earn money to supplement parents' incomes and/or support their youth activities such as clubs, choirs and sporting activities. Girls mostly earn cash to help support their families (they reported buying lotions, sugar, vegetables, dried fish etc.), while boys said when they get their pay from groundnut shelling, they first "*apologise to themselves*" (pamper themselves) by spending some of the money on beer. They also spend some of it on their personal needs and less so on household needs. Most of the adult women and men that shell groundnuts as labourers are among the poorest in the village who aim to earn cash for their households. They engage in a range of labourer or piecework activities (*maganyu*) such as collecting firewood for sale, cultivating fields for food or cash, and in Dedza, collecting thatching grass for cash. Within all these categories there are sub category of habitual labourers and *ad hoc* labourers. Among the *ad hoc* labourers were pregnant women and guardians at a local hospital in Mkanda (serving villages including Kafere/Milioti and to a lesser extent, Kalulu village). These shell groundnuts as they wait to deliver their babies or as they act as guardians to patients in order to earn cash for basic necessities whilst at the hospitals such as soap, food, and others.

All FGDs participants that were not labourers agreed that labourers would suffer the most if mechanised shellers became popular. They however pointed out that groundnut shelling is not a full time occupation and that other piecework would be available for labourers. They also argued that other piecework will get less anyway due to development that will see other technologies displace manual labour. Men were more likely to express these (dismissive) views than women, perhaps reflecting the fact that they are less likely to be impacted heavily.

Other non-labourers felt that the impact of mechanised shellers would be substantial and there would be need to find alternative income generating options for labourers, suggesting that these labourers could become machine operators. However, they also pointed out that machines would need far fewer operators than manual shelling. Moreover, based on the fact that users of hand operated mechanised shellers find them easy to use, there appears little motivation for farmers to pay for others to operate the shellers. The exception is electric shellers since they often operated by an employed operator and they are not mobile.

Labourers had views that were largely consistent with non-labourers i.e. that they would be the most affected, and that shelling was part time and there are other opportunities. However, there was a difference in the attitudes towards employment losses between youth groups and adult labourers. Whilst youth groups felt that their loss of jobs would be part of the development process (comparing it to mobile phones and that old ways have to become obsolete), adult labourers were more anxious because they heavily rely on income generated from groundnut shelling. Even among the youth, there was a difference in attitudes between girls and boys, with girls being more anxious about job losses while boys felt its simply part of progress. This is likely because more girls than boys are engaged in hand shelling. Moreover, girls appear to spend their earnings more on personal and household necessities while boys spend the cash on these but also on alcohol. It is therefore likely that the loss of incomes has a more adverse impact on girls than on boys.

One male KI respondent reported that in addition to reduced employment opportunities, mechanised shellers had depressed wages for the shelling labourers.

Before we used to get K200 for a bucket but now they pay us K150 per bucket. They say that the mechanised shellers are cheaper and faster because one *burundi* costs K500 at the mill (electric sheller). So we accept this because there is no other option and if we don't [accept] they can go to the shellers.

KI, Kafere village, Mchinji

One of the women in the Kamgunda village reported that if the machine was to be introduced in the village and labourers were not included as co-owners or beneficiaries, she would sabotage it:

For me, if that machine comes, I will break it. Truly. I will just go as if am interested in seeing it, may be when a friend is using it. The moment they are away I would just break it and then pretend I know nothing. But I promise you I will break it because we *maLameck* (labourers) suffer and this would take away our salt.

Women labourers FGD participant, Kamgunda village, Dedza ²⁵

Other participants in the group disagreed with her methods but did say that it would have adverse impacts on their livelihoods and would increase social discord and that they would sabotage it in other (undisclosed) ways.

Although both women and men engage in manual shelling of groundnuts for cash, it is likely that women suffer greater set-backs when mechanisation is introduced as comprise the majority of manual shellers and tend to be poorer than their male counterparts. As such, they more heavily rely on income generated from manual shelling. In addition, as FGD participants pointed out, women in general but the poorest women in particular, have fewer options to engage in other income opportunities due to limited mobility, and low entrepreneurship skills.

²⁵ This woman was already open about the fact that after her divorce, she has been subsisting on subsistence farming and transactional sex, mostly with married men in the village. She contended that there was no point in getting married because men did not provide for their wives anyway. She contended that she was in a better position because she got paid for sex while married women did not and considered the risk of getting sexually transmitted diseases to be higher for married women.

4 Factors that affect the impact of mechanisation of groundnut shelling on gender equality and women's empowerment

Certain factors not directly linked to mechanisation are likely to affect whether or not mechanisation benefits women and whether or not it will be sustainable at all. As such it is important to explore these factors and where possible, incorporate them in the programme designs to enhance sustainability. These are discussed below:

4.1 Clubs, associations and cooperatives

With the exception of Kalulu, Kafere and Milioti villages, which have access to privately owned electric and hand shellers, all other villages assessed accessed shellers through NGOs who provide them through clubs, associations and cooperatives. Through these farmers also access skills for using the shellers, for better management of their groundnuts and information on gender and women's empowerment.

An assessment of clubs under Machichi cooperative showed that both women and men hold positions such as club chair persons and deputy while in all but one of the clubs under the cooperatives it is women who are appointed club treasurers. By holding such positions, women gain some level of decision-making that they would otherwise not have. Although this only directly affects a few position-holding members it most likely also provides role models for other women.

Further, through information they receive at clubs, women are able to return home and make suggestions to their husbands and are (sometimes) listened to. Both women and men reported this saying that because women are more likely to be club members than men, they are increasingly *"leading their families when it comes to development activities"* (FGD, Men, Kamgunda village, Dedza). This does not mean that women are becoming household heads but rather that they are more likely than men to join development activities and it is their experiences that persuade men to join such clubs.

In terms of economic empowerment, clubs, associations and cooperatives also play a key role in supporting women's roles and positions in the groundnut value chain by providing storage space for the groundnuts. Machichi cooperative and Chimatiro village for example are provided with warehouses where they can store their produce including groundnuts. The NGOs then support the identification of buyers and together with the storage space, these facilitate the sale of produce in bulk allowing farmers to sell them at a fairer price for them. To further enhance women's empowerment, preferential support for women's produce can be facilitated. A case in point was identified Machichi cooperative where women farmers were told to wait and not sell their produce until the market for groundnuts was more producer friendly and a bulk buyer had been identified. Men would also wait until the price improved but the NGO specifically supported the identification of the bulk buyer for women's groundnut produce.



Warehouses allow bulk sales but also enable some women monitor proceeds

Case study: Machira seed group

In Chimatiro village in Lodzanyama group of villages, a group of women were organised through support from RLEEP in 2012. The group comprises 12 women who engage in groundnut production and sales. They were provided with a metal, hand operated sheller. They have also been provided with a planter, scale for weighing their produce, tarpaulin on which they grade the groundnuts, moisture meter for checking moisture content, a warehouse for storing groundnuts, and 'paper' for covering groundnuts. The group rents-out the sheller in a fee-for-service at K200 per bag of 20kg. For members of the group, the charge is at a discounted rate of K100 per bag. The money is kept in the group's account. According to the women, being in a group has enabled them to pool their resources and rent a field, which allows them to harvest and sell their groundnuts as a group. On average, as individuals, they produce an approximately 10 bags per season.

As a result of the sheller and associated support mechanisms, the women reported that their lives have improved. Examples of this improvement was that they were constructing brick houses – a much desired symbol of economic development – signalling that they are experiencing economic empowerment. They also reported that postharvest loss was reduced by having a tarpaulin to put their groundnuts on, and reduced moulding and risk of aflatoxins. This is also likely to contribute to increased incomes from more groundnut sales.

The women further reported decreases in backache, which was previously caused by sitting for long periods of time to hand shell the groundnuts. They also reported that men are more likely to shell groundnuts with their wives as a result of the machine and this increases their contentment because they are spending time together. This, they said, makes them the "envy"/role models of the village because their families look united. Being in a group also enables some of the women to strategise and have more decision-making power over their incomes because this is a group income. As a group they have rented a plot where they plant the groundnuts and they plan to rent another field this season.

Case study: Ntegeza village

In Ntegeza village, a group of women also formed a club that has helped them to use their collective power to access markets and profit from groundnut production. By pooling their resources together, they bought two pieces of land to grow more groundnuts and a bicycle, which helps them to take their produce to the market. The bicycle is also used to collect domestic water from the next village and to transport members to the hospital. A group of women buying the first bicycle in the village is an important achievement because bicycles are typically the domain of men i.e. they are generally purchased and used by men. As such it can be considered as an investment that contributes to changing gender norms. Thus incomes from groundnut production, facilitated by being in a group, having a sheller that reduces time spent shelling groundnuts, and generates money by being rented out, has contributed to women's empowerment in Ntegeza village.

However, making markets work for the poor also requires that as those that are vulnerable are not excluded or their position made worse. In Ntegeza village, another group of women felt resentful because they were "excluded" from the processes and feel a widening gap between the rich and the poor women in the village. Although (the main part of) this exclusion was not an active strategy on the part of the NGO (RLEEP) that introduced the sheller to the village, these women felt that groundnut production, the hand operated sheller and support from NGOs are a key part of this sense of exclusion and the resulting discord:

4.2 Farm inputs: improved seed varieties and market information

Seed availability is another key factor that is crucial to ensure that mechanisation has a positive impact on socio-economic outcomes in general and women's empowerment in particular. As put eloquently by one FGD participant *"without the seed you would not have the groundnut to borrow the machine for"*. In all FGD except two, participants when asked what else would transform their groundnut production responded that there is need for groundnut seed. Women, who usually have more limited access to farm inputs, could particularly benefit from enhancing the distribution of groundnut seed loans and including women-focused seed loans (and other efforts) to enhance their productivity. The experience of microfinance institution which preferentially provides access to finance to address historical and structural factors that have prohibited women from accessing finance can be useful in such affirmative action.

Market information is also important for women to better benefit from groundnut production. Being informed does not only allow women to negotiate for better prices at the market, it also allows them to hold their husbands' to account for the amount they claim to have generated from the sale of groundnuts. Notably, a male FGD participant stated:

Men often spend their money on beer and come home and say I sold everything for MK10,000 when it was MK100,000 or MK40,000. But you cannot do that with groundnuts. The women know how much it sells for and will ask exactly what you sold it for. You cannot lie or there will be arguments

Men's FGD, Chimteka II, Mchinji

In addition, when farmers have an idea of how the prices will evolve, they strategise on when to sell their produce. According to one FGD with men, women were told by RLEEP not to sell their produce until at a later stage, pending a signal from the NGO. The men although they had the option of waiting as well, decided to sell their produce:

We were impatient and sold our produce as soon as the price improved a little. We sold our groundnuts for K330 per kilo and were untouchable. A few months later when the NGO told the

women to sell, they sold for K700 per kilo. We were ashamed. You see, men are stubborn and the women showed us that although we are household heads we don't always think properly. They can think better

Men's FGD, Chioko village, Mchinji

5 Summary of key findings and recommendations

This section summarises the key findings of this study and presents a number of recommendations to help ensure that the introduction of mechanised groundnut shelling is gender-responsive and promotes gender equality and women's empowerment.

5.1 Key findings

1. Women play an active role in all stages of groundnut production, but control of income generated from groundnut sales involves complex gender dynamics

The study established that women are actively engaged at all stages of groundnut production and processing, from seed selection to selling. However, when at the sales stage, as with other crops, there are often intra-household conflicts and negotiations over how the money earned should be used. This and other findings of the study suggest that, while women have greater control over groundnuts compared to other crops, such as maize and tobacco, this control is limited, especially regarding the control of income generated.

2. Gender division of labour when mechanised shelling is introduced

- **Men and boys operate the sheller**
- **Women and girls also operate shellers but to a lesser extent. They also winnow**

The study found that, most commonly, men and children (mostly boys) operate the machines while girls and adult women winnow the groundnut chaff. No such winnowing is needed when the shellers are electric because most of it is removed during the shelling process, and the rest is blown away, a task so far done by both women and men.

3. The introduction of mechanical shelling leads to a displacement of casual labourers who provide hand-shelling services

A considerable proportion of hand-shelling of groundnuts is carried out by casual labourers, who comprise mostly poor women, as well as some men. With the introduction of mechanical shelling, these labourers lose an important income generating opportunity. Since this group is already likely to be very poor, this displacement may have serious negative effects on their ability to meet basic needs and is likely to negatively affect overall development outcomes.

4. Women, in particular, experience difficulties in operating metal shellers and have preference for electric and wooden shellers

Both women and men reported that although they can use metal shellers, these are harder to operate and require more physical exertion and is therefore more physically demanding. Wooden shellers were reported to be easy to operate by both women and men and seen as more women-friendly in terms of operation and use. For those that had experienced electric shellers they preferred these to either metal or wooden shellers, and electric shellers were the ones that were seen as the easiest to use for both women and men.

5. Ownership of shellers is dominated by better-off men so woman and poor people in general lose out

The study found that most shellers are owed by NGOs or groups and the few private owners were all relatively well-off men. This suggests that the likely economic benefit from owning a sheller is among better-off men, rather than women or poor people, unless mitigating strategies are put in place.

6. Overall benefits of mechanised shelling:

- **Reduced drudgery, especially for women, because they dominate manual shelling;**
- **Reduced cost of shelling and greater volumes of sales of groundnuts leading to increased incomes;**
- **Rental income from shellers accruing to individual owners and also clubs;**
- **Productive use of time saved (potential)**

The main actual benefits of mechanised shelling are reductions in drudgery; reduced costs of shelling groundnuts since mechanised shellers cost less per unit compared to manual labourers; and for women and men who in addition to producing their own groundnuts participate in retailing it, increases in incomes due to rapid turnover of sales. Potentially, women and men can also earn incomes by renting out shellers for a fee. Currently however, only clubs and a few men that can afford investing in shellers have benefited in this way. Another potential but currently underutilised pathway to benefits is the productive use of the time saved as a result of mechanised shelling.

7. Overall negative impacts of mechanised shelling

- **Loss of income of labourers who provided hand shelling services (most poor women)**
- **Women re-legated to supportive task of winnowing, not operating the sheller (potential)**

One critical negative impact of mechanised shelling is the loss of income by labourers who provide hand-shelling services, often poor women. Potentially, mechanised shelling, particularly using hand operated shellers, can also have negative effects by relegating women to supportive tasks such as winnowing which are likely to be poorly remunerated.

8. Barriers to women fully capitalising on mechanised shelling:

- **Women un-friendly design of shellers**
- **Gender norms that further discourage women from operating shelling machines and re-legate women to supportive tasks**
- **Lack of finance to purchase shellers to rent out or operate for a fee**

Key barriers identified that limit women's ability to fully capitalise on mechanised shelling include the prevalence of metal shellers, as opposed to wooden and electric shellers, which are difficult for women to operate as they require significant physical strength. This physical barrier is further compounded by gender norms that discourage women from operating machines and relegate them to supportive tasks, such as winnowing.

In addition, women are more likely than men to lack the financial capacity to purchase and own shellers, which could be rented out for a fee. While microfinance levels available to women would in some cases be adequate for financing hand operated shellers, they are unlikely to be adequate for financing electric shellers. Yet in some areas close to electric power, electric shellers are the most preferred type of shellers and hand operated shellers are becoming obsolete.

9. No overall displacement of women groundnut farmers as a result of introduction of shellers

Although at the household-level, the introduction of mechanical shelling has led to men taking on a more dominant role in groundnut processing, possibly resulting in even greater male-control over income generated through groundnut production, this has not resulted in an overall displacement of women in groundnut production as the demand for groundnuts in Malawi is growing.

There is however potential that in the future, as the market becomes saturated, women, who typically have fewer assets than men, could be displaced. The driver for men entering groundnut production is however not necessarily mechanisation but increased demand for groundnuts, good market price, low inputs requirements and the low (price) dependability of tobacco – a crop that men have traditionally depended on for their incomes. Nevertheless, well-designed strategies to support women's participation in mechanised shelling can contribute to building women's market resilience.

5.2 Key recommendations

Recommendation 1: Promote women-friendly and competitive sheller designs

The study found that most respondents, particularly women, find operating the metal shellers available in their communities difficult as they require too much physical strength. There is an overall preference for wooden, as well as electric, shellers.

In areas where electrification is common (for instance in and around trading centres), electronic shellers should be considered as the most preferred and women-friendly technology. Having said that, it must be acknowledged that the upfront costs for the electric shellers would be very high and in many cases there is also the additional cost and efforts needed in finding premises from which to operate. Suitable financing options would therefore be needed to support such investments.

Critically, since electrification is rare in rural Malawi, it is recommended that other options are also considered. For instance, diesel-powered shellers could also be considered in areas where there is high production of groundnuts and hence a larger demand for mechanised shelling. Alternatively, wooden shellers as well as metal shellers that have a handle or wheel to create levered force and shell through an indirect mechanical action should be promoted, instead of the hand-operated metal shellers that rely on manual action alone currently in use.

Recommendation 2: Address gender norms to encourage women to operate mechanical shellers

In addition to the physical difficulty of operating some shellers, the study found an underlying gender norm that discourages women from operating shellers, leaving the task to men instead. The exact origin and reasoning behind this norm is, not doubt, complex and the report has not been able to provide an in-depth understanding thereof. However, it seems a critical contributing factor resulting in women being re-legated to supportive tasks in groundnut production through mechanisation. It is recommended to further engage with this norm to better understand it, as well as working with women's groups to explicitly encourage women to carry out mechanical shelling themselves.

In addition, it is recommended to work through household methodologies that involve men alongside women to avoid a cultural backlash against effort to promote gender equality and women's empowerment. Notably, the report identified a certain level of resistance to gender equality among both women and men. For instance, one woman in Chimatiro hamlet in Dedza (Lodyanyama village) stated that "we just watch the households that practice gender and just watch them and say ohoo". The sentence implies "practicing gender" (i.e. a more balanced man-woman power relationship) is negative and such marriages are likely to fail.

To mitigate this situation it is, therefore, recommended to engage in widespread consultation with villagers, going through but not depending on, village leadership. Complementing the above approach is the need to engage both women and men in gender sensitisation and training. A key message that is likely to resonate with men is not emphasis on men's privileges and women's subordination, but in highlighting the costs of the status quo and stressing the positive outcome of more equality on the household as such.

Recommendation 3: Promote toll model for shelling

Promote a toll model for shelling through which smallholders can bring their groundnuts to a sheller who has a machine and provides the actual shelling and winnowing service. Provided that the shellers are reasonably priced and easy to reach, this should enable female farmers to access the benefits of mechanised shelling without having to rely on male labour.

Recommendation 4: Link casual labourers who engage in hand-shelling to alternative income generating activities

With the introduction of mechanical shelling, casual labourers who engage in hand-shelling are likely to lose an important income generating opportunity. Since this group mostly comprises poor women and some men, this may have serious negative affects on their ability to meet basic needs and is likely to negatively effect overall development outcomes. There is, therefore, a need to link these labourers to alternative income generating opportunities.

Recommendation 5: Facilitate access to finance for women to purchase shellers

Where economic analysis shows business viability, female groundnut farmers should be supported y linking them to access finance, and supported to invest in shellers. For most part, this will be realistic only with hand shellers since electric shellers have much higher upfront costs. However, options for getting women to engage as co-owners of electric shellers should also be explored. This option is particularly viable in villages where there are no clubs that already own and hire out shellers to avoid immature competition, which can result into failures of either or both club-owned and women-owned shellers. To reduce the women's risk of high indebtedness resulting from the financing but also to capitalise on peer support, sheller ownership can be group-based.

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