Oxfam Research Reports

ETHIOPIA'S SESAME SECTOR

THE CONTRIBUTION OF DIFFERENT FARMING MODELS TO POVERTY ALLEVIATION, CLIMATE RESILIENCE AND WOMEN'S EMPOWERMENT

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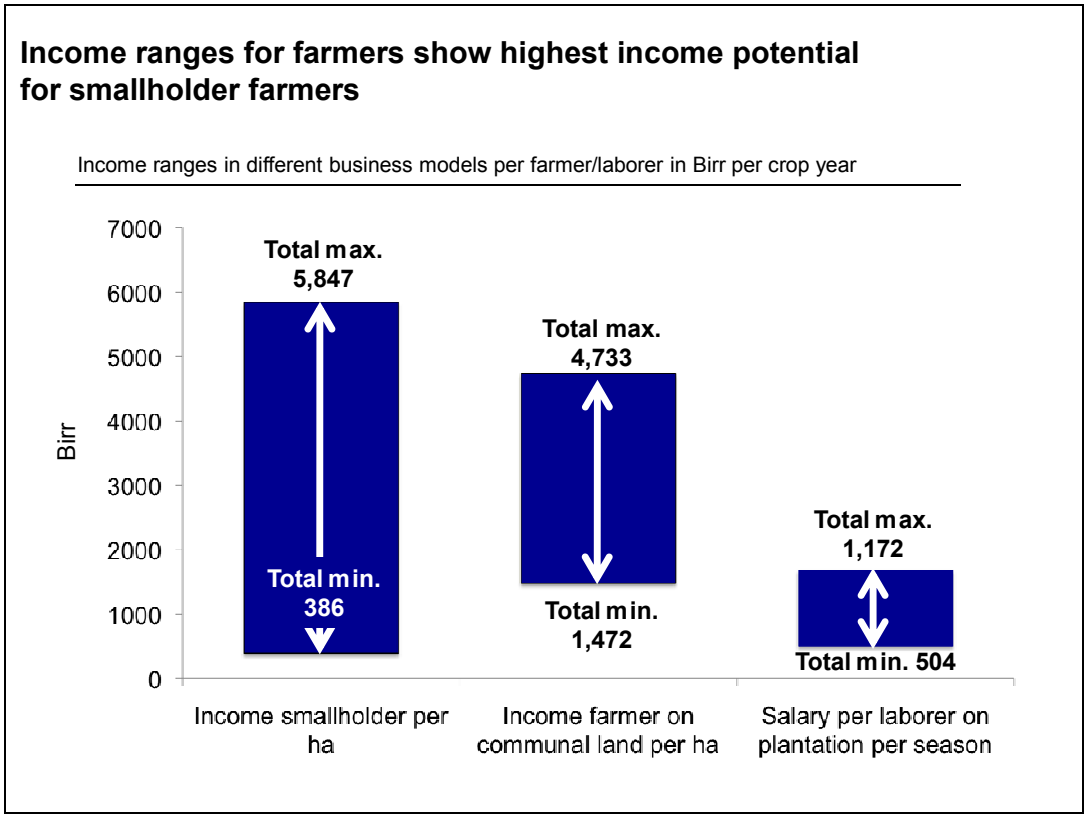
EXECUTIVE SUMMARY

The key findings of this report are that sesame is a suitable crop for poverty alleviation for smallholders in Benishangul Gumuz and that the smallholder model is competitive versus the large-scale investor model in terms of productivity. Farmers can achieve high profits without significant up-front investments. With minimal expenditure for sesame seeds and some simple equipment for ploughing, weeding and harvesting, farmers can cultivate sesame on a family labor basis. Potential income is higher in the smallholder model than from either communal land management, or from the salaries from large-scale investors (see Figure 1). However, this potential is mirrored by the highest risk for farmers to receive the lowest income. Smallholders can mitigate this risk as well as increase their income further through membership of primary production co-operatives that offer higher sales prices and paid-out dividends.

Figure 1: Farmers' income ranges in different business models



Looking at current income levels, the salary a single laborer receives from working one season on a large-scale sesame farm is considerably lower than that of a smallholder cultivating his own land. However, the chart only displays incomes for a farmer per hectare and a laborer per season. Both farmers and paid laborers often receive additional income from other crops and more than one hectare of land or salaries from other jobs. In order to compare farmers and hired laborers, the authors evaluated profits made during one crop season looking at a farmer's income and at salaries received by a hired laborer. In the case of hired laborer, a per-hectare comparison is not suitable since one laborer will always be working on multiple hectares consecutively in a team rather than on one hectare alone.

The smallholder model is particularly well suited for sesame production and is therefore sustainable in Benishangul Gumuz. Its suitability derives from the high labor intensity of

sesame cultivation as well as the shortages of labor and high barriers to mechanization that face large-scale investors. At current profit levels investors in Benishangul Gumuz are not willing to undertake substantial investments for mechanized weeding and harvesting. Without mechanization, the competitive advantage of large-scale sesame cultivation is limited. Farming techniques of investors remain similar to those of smallholders. Labor thus remains at the core of sesame production and a key determining factor for profits.

Some large-scale investors had to pay premium prices to sufficiently incentivize laborers to diligently work their fields. Investors confirmed that an increase in hectares cultivated leads to a decrease in yields per hectare since manual labor is most effective on small plots of land. If sesame production in Ethiopia were further mechanized, however, the competitive advantage of large-scale farming versus smallholder farming would improve. The particularities of sesame cultivation currently practiced in Benishangul Gumuz make such changes in mechanization unlikely in the near-term future.

Despite this potential for smallholders, sesame cultivation also bears multiple risks since it is a highly sensitive crop. Sesame requires careful handling especially during weeding and harvesting with shattering pods causing crop loss of up to 30%. Even small deviations from good practice can significantly reduce yields. In addition, the sesame plant is very delicate and thus particularly prone to weather damage. Due to changing climatic conditions, the area of Benishangul Gumuz has recently witnessed an increase in erratic rainfall pattern, with ice-rain and heavy rain destroying the entire crop in some areas and making sesame more susceptible to crop diseases. Those threats concern smallholders and large-scale farmers alike. However, if risks materialize, smallholders are hit hardest as they tend to have neither household savings nor access to financial support.

In the large-scale investor model, laborers tend not to benefit from potential investor savings in the event of crop failure since most of the laborers are hired on a day-by-day basis. Indirect benefits for laborers exist only if farming is done on a contractual basis and minimum income is guaranteed regardless of crop losses.

Women are marginalized in sesame cultivation as they are excluded from the sales process and expected to manage household labor, thus facing a double work burden. Working as daily laborers on large-scale farms is particularly disadvantageous for women, as they are absent from their homes and have to cope with household labor and potentially also farmland responsibilities after returning from their workday. The smallholder model is more fitting for women since it allows them to manage their double workload burden according to their needs. However, this model should be combined with an equal representation of women as functional members of boards of primary cooperatives. Currently they hold mostly nominal positions if at all.

Mitigating the risks to smallholders' livelihood security requires efforts from all stakeholders. *Farmers* have to abide by good farming practices and can strengthen their position by forming primary cooperatives and actively engage in micro-saving-plans offered by government. *Primary cooperatives* can support farmers in doing so by providing the following: firstly, cooperatives can offer a 2–5% price premium for sesame compared with prices quoted by local traders. Secondly, profits made by cooperatives through reselling sesame at higher prices can be paid back to farmers in the form of dividends. Thirdly, primary cooperatives are legally required to save 30% of annual profits as reserves, which can be used for hardship loans for farmers, communal investments, or back-up savings. Furthermore cooperatives can organize provision of extension services. *Government* agricultural bureaus and research centers need to improve information dissemination on changes in climatic conditions and research on seed varieties tailored to specific requirements of different areas respectively. *Oxfam* can play a critical role in strengthening cooperatives and in serving as an idea generator with respect to potential market innovations, e.g. creating linkages to the private sector through value-added activities by cooperatives or unions, as well as developing risk management strategies such as weather-based micro-insurance for smallholder farmers.

1. INTRODUCTION

Oxfam GB in Ethiopia commissioned this report to assess the contribution of different agricultural business models to poverty alleviation, livelihood security, climate resilience, and empowerment of women in the sesame sector in Metekel and Assosa in Benishangul Gumuz. The findings are based on fieldwork conducted during April 2011 in Metekel and Assosa. Interviews were conducted with 13 focus groups of farmers cultivating sesame on private or communal land, five investors, and five government bureaus and local research center.[1] A particular effort was made to interview women individuals and women associations. The authors interviewed three female-only focus groups, two women associations, and 22 female farmers (of 62 farmers interviewed).

1.1 Sesame production in Metekel and Assosa

Benishangul Gumuz is located in the northwestern part of Ethiopia bordering Sudan and is divided into three administrative zones, two of which, Metekel and Assosa, are considered major sesame producing districts. According to Benishangul Gumuz Regional Agricultural & Rural Development Bureau sesame production in Benishangul Gumuz totaled 37,729 tons cultivated on 60,064 hectares in 2010. In 2009 sesame was cultivated on 46,467 hectares yielding 30,118 tons. While total production increased by 25%, yields declined by 3% mostly due to weather hazards. In Benishangul Gumuz sesame is planted in mid June and harvested in September and October, depending on weather conditions.

Sesame cultivation is considered a smallholder activity although large-scale private investors are increasingly entering the market, following the Growth and Transformation Plan by the Ethiopian government that is promoting large-scale farming to accelerate growth. Exact data on numbers of smallholders and numbers of large-scale investors is not available at Benishangul Gumuz Regional Agricultural & Rural Development Bureau. Estimations by other interviewees suggest that over 90% of the farmers growing sesame are smallholders.

The level of organization of smallholders in cooperatives and unions varies greatly between different administrative zones. Metekel does not have a farmer union and has only one primary cooperative predominantly involved in sesame. In Assosa of 37 villages cultivating sesame, 22 multi-purpose cooperatives exist that deal with sesame produce. They are organized in the Assoa Union. The union is currently trying to acquire new primary cooperative members. The main limitation is that only formally registered cooperatives can become members. In order to register the cooperation has to provide a minimum down payment of 50,000 Birr, which is generated from share sales. Smallholders are often not in a financial position to buy shares, the costs of which range from 50 to 200 Birr in Benishangul Gumuz.

[1] There are four main limitations of the interview data: First, the findings only refer to sesame farming in the Benishangul Gumuz area, which might be different to other sesame farming regions in Ethiopia. Second, farmers often provided estimates on costs and revenues, thus the data are based on what farmers recall and report. Third, the majority of the interviews needed to be translated and some information may have been inaccurately translated. Fourth, investors interviewed were cultivating sesame on land between 100 to 300 hectares. No interviews with large investors cultivating 1000 hectares of sesame or more were conducted and further research is required to fill this gap. To address these concerns, the authors of this study cross-checked the figures through government reports, previous research studies, and academic literature.

Table 1: Sesame production data in Metekel and Assosa 2010

Districts	Area under sesame cultivation *in hectares*	Estimated average yields *in kg per hectare*	Range of yields *in kg per hectare*	Estimated total production *in thousand tons*	Price per kg of sesame *in Birr per kg*	% of production by small-holders *(<10 ha)*
Benis-hangul Gumuz	60,064	630	400 – 1000	38	No data available	No data available
Metekel	28,058[2]	700	400 – 1000	21*	14-15	~ 50%[3]
Assosa	No data available	600	400 – 1000	No data available	No data available	No data available

*Source: Zonal Agriculture & Rural Development Bureau in Metekel; *pre-harvest estimation; post harvest estimation in process for crop year 2010/2011*

According to the Zonal Agriculture & Rural Development Bureau in Metekel, around 28.000 hectares of land are under sesame cultivation, expected to yield around 200.000 quintals, i.e. 20.000 tons, of sesame in 2010. This assumes an average yield of 700 kg/ha. Yields fluctuate heavily between regions and can be as low as 400–500 kg/ha and as high as 800 kg/ha on rain-fed land.[4] Differences in yields are mainly due to differences in soil fertility and farming practices.

Seed varieties in Metekel and Assosa vary, offering different advantages and disadvantages. Farmers mostly grow local varieties that have not yet been officially registered and thus do not fall under what is considered a 'released' variety. The only released variety, according to the Assosa Agricultural Research Center is Abassina.

While the local varieties are generally better adapted to the local conditions, their yields are continuously decreasing since it is common practice amongst farmers to reuse harvested sesame for replanting. However, research centers have shown that replanting the same sesame can only achieve good yields for two consecutive years. After that, farmers should plant a new variety prevent a decline in yields. The main advantage of Abassina is its resistance against a fungus that has destroyed much crop over the last two years even though it is not very tolerant to humidity as such. Unlike many other local varieties, the pods of the Abassina plant do not mature simultaneously; whilst the lower pods of the plant are already matured the top of the plant is still flowering. This makes harvesting very labor intensive, since pods have to be hand-picked. Alternatively the plant can be harvested, when the majority of pods have matured, leading to crop loss at the top and the lower parts of the plant. This can lead to a severe crop loss.

[2] According to the Zonal Agriculture & Rural Development Bureau in Metekel, Metekel is the largest zone with 188,733 hectares under agricultural cultivation out of which around 15% are under sesame cultivation.

[3] 105,000 quintals are produced by small-scale individual farmers while 80,000–100,000 are produced by large-scale producers.

[4] Zonal Agriculture & Rural Development Bureau in Metekel.

Table 2: Seed varieties in Metekel and Assosa

Districts	Currently grown variety*	Potential variety	Productivity *in kg per hectare*	Farming requirements
Benis-hangul Gumuz	Mainly local variety and Abassina; local varieties are currently tested; local varieties better adapted that Abassina	Research is currently underway with respect to the suitability of local varieties; no new varieties expected in the near future (2–3 years)	Abassina: max. 600 on average; local varieties between 600 and 800 per ha; research is underway into the impact of irrigation on dry areas (potential estimated at 1000 quintals)	Problem: Abassina overall not very well adapted to local environment (blight and high humidity); fertilizer shows no impact on productivity
Metekel	Abassina; new white variety introduced by investors	White sesame is only suitable in Guba; Abassina is best suited for Metekel conditions	800 kg per hectare on rain-fed land; 1.000 kg per hectare on irrigated land (avoid blight due to low rainfall and low humidity)	Fertilizer: no positive impact; Irrigation: potentially doubling production
Assosa	Mainly local variety and Abassina	Research is currently underway; no new varieties in the near future (2–3 years)	400 – 600 kg per hectare	Problem: Abassina overall not very well adapted to local environment (blight and high humidity); fertilizer shows no impact on productivity

*Note: * Abassina and local varieties are considered Wolega type (mixed or grey sesame); the Sudanese or white sesame in Guba is considered Humara type.*

Source: Pawe Agricultural Research Center, Assosa Agricultural Research Centre

Currently in Benishangul Gumuz farmers mostly plant local varieties and in some areas the released variety Abassina. According to the Assosa Agricultural Research Centre local varieties are considered best adapted for growing conditions in Benishangul Gumuz, which is a rain-rich, humid region. Abassina is considered to be less well-adapted and sensitive to increases in humidity.

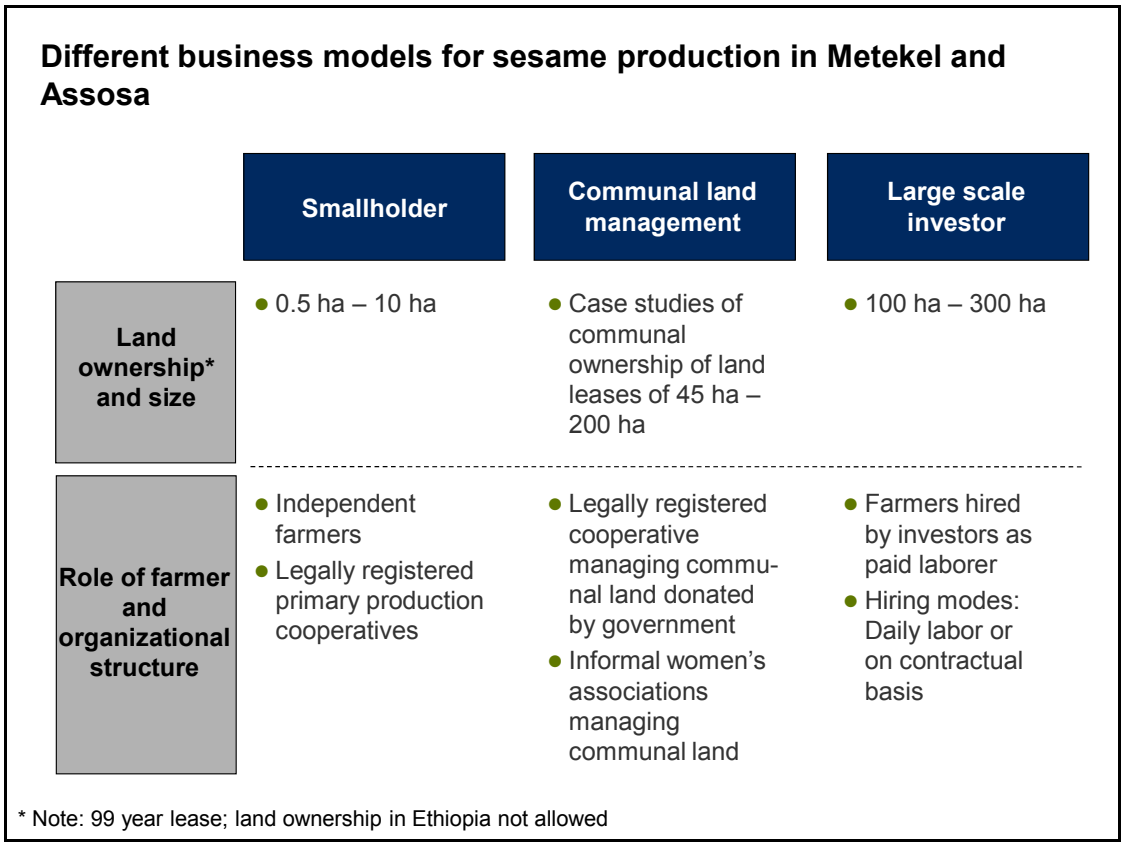
The local government in Metekel provides extension services focusing on improved farming practices, livestock and environmental conversion, with the support of the Pawe Agricultural Research Centre. They advise farmers not to use fertilizer since it does not seem to directly impact the productivity of sesame. Instead the Center proposes rotating crops. Services have been provided to 35,160 farmers last year, including non-sesame producing farmers (70–80% of all farmers).

In Assosa, the Agricultural Research Centre similarly is supporting farmers through testing sesame seeds and providing information about good farming practices. It has collected over 150 different local seed types to test for productivity and suitability to soil conditions in Benishangul Gumuz.

1.2 Different business models

For the purpose of this study three different business models were identified: smallholder farmers, communal land management and large scale investors.

Figure 2: Overview of different business models



Source: Expert interviews and team analysis

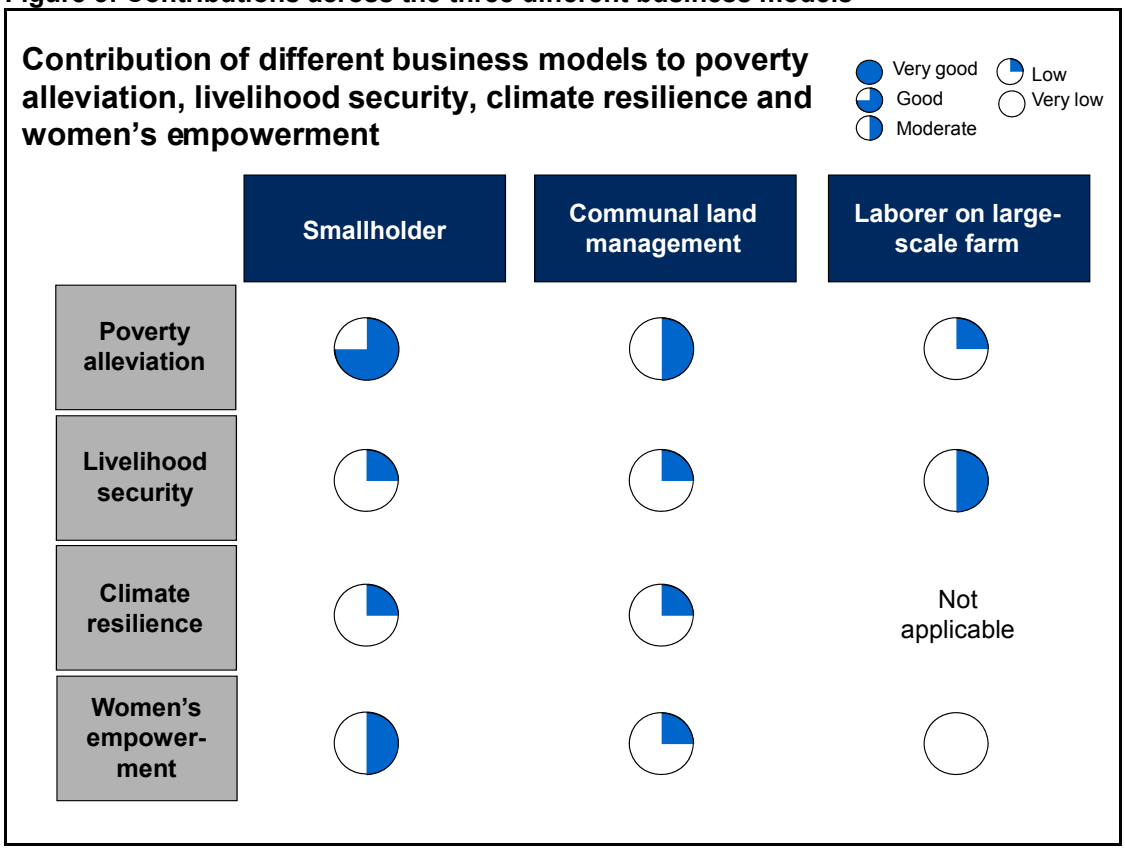
There is no general agreement about what constitutes a smallholder. Different research organizations often set the cutoff level to less than five hectares. However, in Metekel and Assosa even farmers with ten hectares considered themselves to be smallholders, especially since they often cultivate no more than three hectares with sesame. Therefore, in the context of this study smallholders were defined as cultivating up to ten hectares of land. Both within the smallholder model and within the communal land management model two sub-models were differentiated. Smallholder farming can occur both in the form of independent smallholder farmers and in the form of farmers organized in primary production cooperatives managing the sales process. Communal land was observed to be managed by formalized cooperative structures as well as by informal associations.

Women are involved in all the three business models. In the smallholder model, women are independent farmers; in the communal land management model, female farmers are members of a cooperative or women's association farming communal land. In the large-scale investor model, women are working as paid labor on commercial farms.

2 THE CONTRIBUTION OF DIFFERENT BUSINESS MODELS

Four criteria are used to evaluate the contributions of the three different business models: poverty alleviation, livelihood security, climate resilience and women empowerment. Findings show that whilst the contribution to income levels can be highest in the independent farmer model, it also can leave the farmer most vulnerable to external shocks and crop losses if the farmer fails to build up reserves, i.e. through paying into cooperative reserves or other saving mechanisms. In the absence of a cooperative structure, independent smallholders are least likely to accumulate assets that can help cushion unexpected weather hazards and undertake adaptive measures for climate change. The smallholder model thus contributes least to livelihood security. Hired laborers, while facing a lower income potential are slightly more protected against external shocks since they can easily switch to work in other crops. Finally women's empowerment is important across all business models and cannot be accomplished without institutional support and management of different workloads, i.e. household and farming responsibilities. Opportunities for women are mostly seen in the smallholder model, which allows women to manage their double workload burden rather than with the large-scale investor model in which women are absent from their homes. It is important to note, however, that improvements in the smallholder model in general do not automatically translate into improvements for women. Because of this important distinction, a separate section of this report looks at women empowerment and policies and actions required to strengthen women's role in the sesame sector.

Figure 3: Contributions across the three different business models



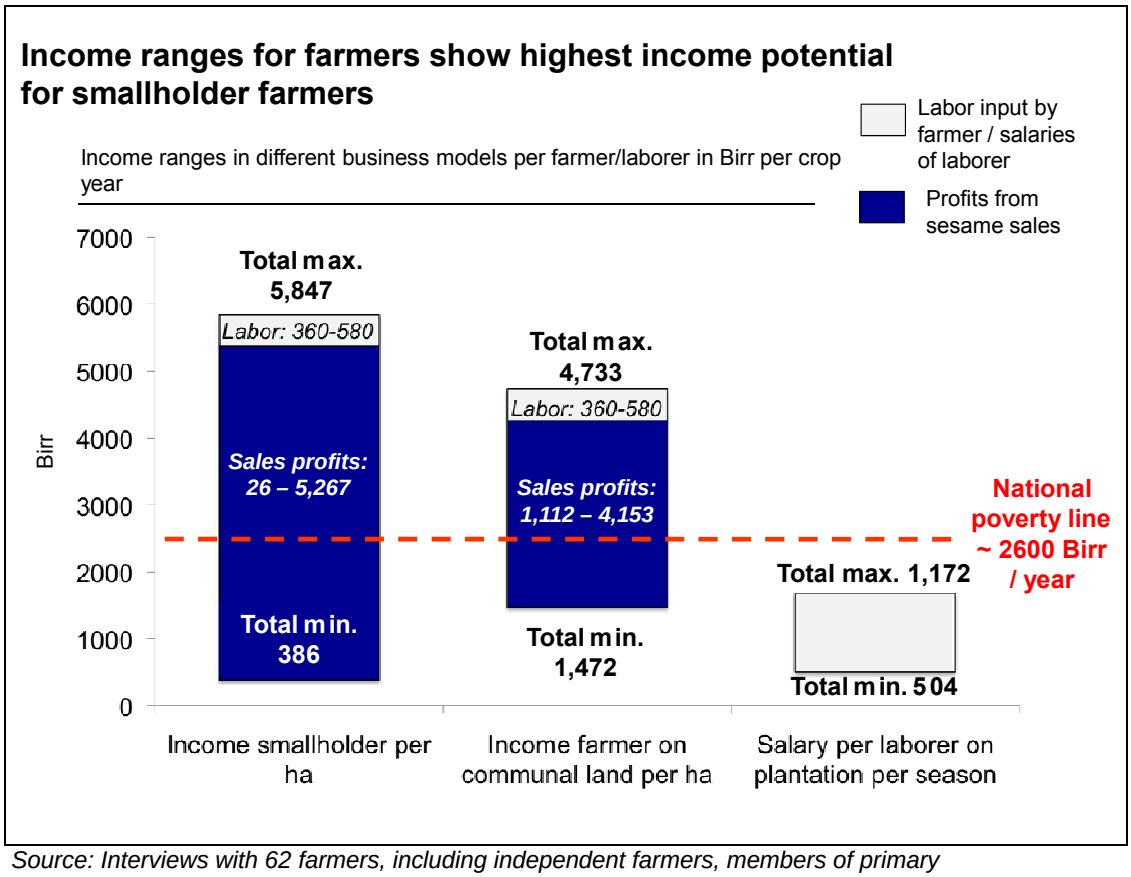
Source: Expert interviews and team analysis

2.1 Poverty alleviation and livelihood security

For the purpose of this study poverty alleviation was defined as raising farmer income from sesame production.[5] The comparison was done through different case studies in Metekel and Assosa, representing the respective business models. Though some general trends became apparent, the contribution to poverty alleviation within the same business model varied greatly. Figure 4 shows the variation of generated farmer income across the three business models. Findings show that income potential is highest among smallholder farmers albeit with a low level of livelihood security, as income can potentially drop below the national poverty line. It is important to note that the chart only displays income on a per farmer basis from sesame cultivation. Farmers often receive additional income from other crops grown on their land and sometimes also from non-farming activities.

Income potential for laborers working on large-scale farms is lowest based on income potential for one laborer on one hectare of land. This is due to the fact that large-scale investors prefer to use large teams of laborers to finish one activity, e.g. weeding, within a short period of time rather than using fewer laborers for a longer period. However, it has to be taken into consideration that these numbers only reflect the salary one laborer receives from the investor from cultivating one hectare of land. The laborer is likely to receive additional income from other jobs during off-season.

Figure 4: Income from sesame across different business models



Source: Interviews with 62 farmers, including independent farmers, members of primary cooperatives, organizations managing communal land, and large-scale investors; PASDEP Statistics 2005

[5] Labor income is defined as full days worked per farmer during one sesame season multiplied by the average daily labor rate in the respective region. Profit is defined as revenue from sesame sales during one season minus cost of production including labor costs of the farmer himself. The term "retail profits" refers to the profits made in buying and re-selling sesame and is defined as revenue from sales minus price of sesame purchased.

2.1.1 Income of smallholder farmers from sesame production

Findings show that farmers' income levels[6] can be highest but also lowest for independent farmers. This is mainly due to a low cost structure involving mainly family and neighbors as workers. Work as an input factor can thus be easily adapted to variance in yields. However, high profits can only be realized if farmers have financial means to buy or rent oxen for ploughing and easy access to an EXC-licensed trader. If farmers have to use hand tools for ploughing, yields can drop by as much as 50% making the independent smallholder model far less attractive. Farmers using oxen for ploughing reported average yields of three to five quintal per hectare, while farmers ploughing by hand reported yields between one and three, sometimes four quintal per hectare.

Where volumes produced are low and supply chains involve multiple traders, cooperatives can add value by functioning as benevolent intermediary. Currently cooperatives are reported to buy sesame at prices exceeding those of local traders by 2–5%. In addition, cooperatives buy sesame and realize profits by re-selling sesame at higher prices achieved through storing sesame and waiting for market price to increase. Cooperatives can also facilitate reaching the threshold of 50 quintals required to sell directly through ECX. The profits made from re-selling are paid out to members in forms of dividends. Currently case studies showed that cooperatives were able to resell with a margin of 160 to 270 Birr per quintal. Assuming an average yield of four quintals famers can achieve additional income from their produce alone totaling 448 to 756 Birr per hectare, including a 30% reserve retained by the cooperative.[7] However, due to the 30% reserve the cooperative is legally required to retain from profits made from reselling, the arbitrage achieved by the cooperative needs to be significant compared to the price farmers themselves are able to attain. Also, benefits offered by cooperatives through cutting out traders and profiting from arbitrage are likely to decline with ECX-branches opening up throughout Ethiopia thus creating price transparency in the market.

In evaluating income from sesame farming for smallholders two sources of income were treated distinctly: firstly income from labor – equally treated as a cost and thus deducted from profits – and secondly income from profits. This distinction was necessary in order to correctly compare the different business models. Only smallholders and farmers on communal land possessed both sources of income. Hired laborers only generate income through paid work, i.e. salaries.

Labor income

Income from labor is difficult to assess since most smallholders do not calculate a price for their own work. Farming responsibilities are distributed between family members and neighbors in exchange for food and local drinks or contributions in kind. To put a monetary value on farmers' labor, several assumptions had to be made. Firstly, it was assumed that smallholders equally participate in each activity undertaken during cultivation. That is to say if for example weeding lasts for 10 days the farmer will work himself for full 10 days – supported, if needed, by friends and family members. This is based on the assumption that certain activities have to be completed in a certain time frame. The income for the farmer is based on the maximum labor he himself can put into such an activity. Furthermore it was assumed that farmers' daily fee equals that of a daily laborer. Thirdly, for the purpose of calculating variations in labor income, it was assumed that time spent on fields was similar across all smallholders and that variations occurred from labor productivity, i.e. from the number of additional people required per activity not from the duration of each activity. Based on these assumptions the individual farmer

[6] This analysis accounts for household labor as an opportunity cost assuming that farmers could have spent the time on the field alternatively as daily laborers elsewhere. The time spent by the farmer is thus taken into account as unpaid salary. However, in the mind of farmers household labor is not considered a cost.

[7] Reserves can be used differently. Cooperatives use reserves to provide financing benefits by offering loans on favorable terms to its members as well as supporting the local community through, for instance, opening retail shops for consumer goods.

receives a salary ranging from 360 to 580 Birr per hectare depending upon whether he uses oxen for ploughing or not and on the assumed rate of daily labor.

Table 3: Range of income from labor input for smallholder in Birr per hectare

	Minimum income with ox			**Maximum income without ox**			**Maximum income with ox**		
	Income in Birr per hectare	*Days spent on field by farmer*	*Rate for daily labor*	*Income in Birr per hectare*	*Days spent on field by farmer*	*Rate for daily labor*	*Income in Birr per hectare*	*Days spent on field by farmer*	*Rate for daily labor*
Total	**360**	**24**	**15**	**465**	**31**	**15**	**580**	**29**	**20**
Ploughing	90	6	15	195	13	15	120	6	20
Planting	30	2	15	30	2	15	40	2	20
Weeding	150	10	15	150	10	15	280	14	20
Harvesting	45	3	15	45	3	15	40	2	20
Threshing & Cleaning	15	1	15	15	1	15	40	2	20
Field preparation	30	2	15	30	2	15	60	3	20

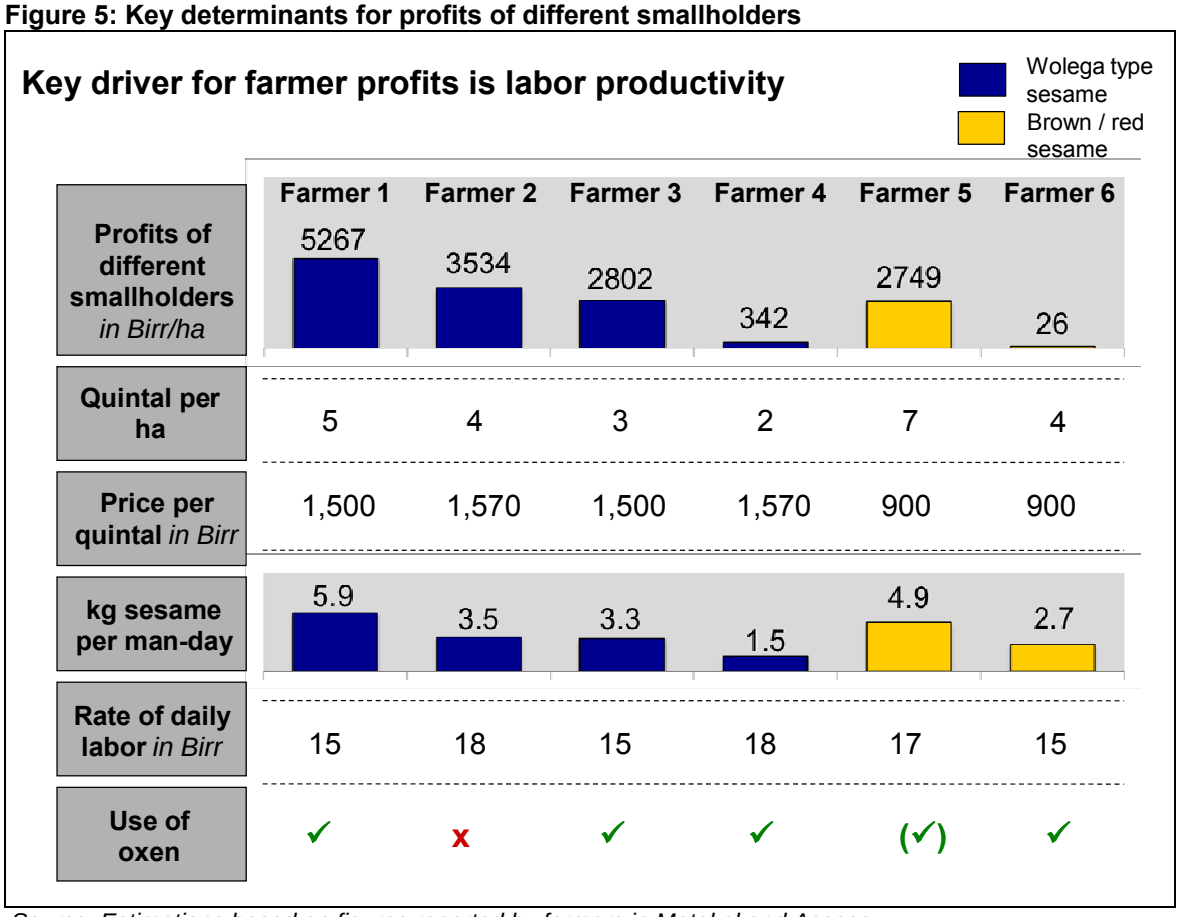
Source: Figures reported by farmers in Metekel and Assosa

Income from profits

In order to compare the different business models, profits from sesame cultivation for smallholders was calculated by assuming a fictitious cost for labor input based on above-mentioned assumptions. Figure 4 only refers to profits made by smallholder farmers. The method for calculating profits for all six farmers was identical, even though some assumptions[8] had to be made where farmers could not recall prices. In these cases the authors of this report used market prices instead.

[8] The authors of this report evaluated profits based on the following cost structure that interviewees reported: Cost elements are seeds, labor cost at daily rates of hired laborer during ploughing, seeding, weeding, harvesting, threshing and sesame cleaning as well as field cleaning, ploughing costs (tractor or oxen), equipment costs (mats, cutting devices, sacs for packing, cleaning devices, other), transportation costs to traders, other inputs such as pesticides (though hardly ever used). Equipment was discounted for the duration of use on one hectare of land for one sesame season. The cost structure in the investor model was not developed since the report solely focussed on income for paid labor and not on profits made by the investor.

Figure 5: Key determinants for profits of different smallholders



Source: Estimations based on figures reported by farmers in Metekel and Assosa

In Figure 5, compared with the Wolega type, the yields from brown sesame are higher, but the price received is lower. This is because color, size, foreign matter, oil content, and odor mainly determine the price of sesame. Depending on world market demand, prices can vary for different types of sesame. However, white sesame generally gets higher prices than grey or mixed sesame and brown or red sesame. Brown or red sesame is considered the lowest type, but which generally achieves higher yields.

2.1.2 Income from communal land management

Unlike cooperatives that primarily offer additional income opportunities to farmers working on their private land, the Metekel Primary Cooperative as well as some women's associations in Metekel and Assosa constitute a distinct business model since they themselves cultivate sesame on communal land provided by government. Although the example of the Metekel Primary Cooperative showed high profitability of communal land cultivation, other examples of corporations raised significant doubts as to whether communal land management is a sustainable business model. Reliable and evenly shared workload on communal land seems to be difficult to ascertain, especially if members have additional private land that gets serviced first or other household obligations (see case studies of women's associations below). Based on these doubts the authors of this report believe that an improved smallholder model with additional income opportunities from cooperative membership is superior in the long run. The downside of the smallholder model is reduced income opportunities for the cooperative since profits from sesame production tend to be 3–4 times as high as profits from sesame retailing. This in turn leaves the cooperative in the smallholder model with smaller reserves and thus fewer options to invest in expensive but useful tools for its members such as tractors.

Assessment of communal land management is based on case studies of Metekel Primary Cooperative as well as on women's associations in Metekel and Assosa. Only

Metekel Primary Cooperative achieved substantial profits from its business model (see case study). The main reason was because members are bound to commit approximately three months' labor to communal land and are only allowed to farm their private land on weekends. Women's associations farmed communal land on a voluntary basis, which led to irregular farming activities when members were not involved in household activities or farming private land. This in turn resulted in minimal yields of sesame and large portions of land remaining uncultivated altogether.

Case study: Metekel Primary Cooperative

Metekel Primary Cooperative has 120 members and owns 200 ha of land that was donated by government, 100 ha of which are used to grow sesame. Farmers can become members by buying shares at 50 Birr per share. According to the cooperative, 20 members are female farmers owning one share each, while 100 members are male owning a total of 120 shares. The cooperative has seven board members, two of which are women, albeit without a formal function.

The members' main contribution is labor. Of 120 members, 15 members are assigned to plant, 60 members to weed, and 60 members to harvest sesame on a full time basis from mid June to September/October. Ploughing is done by rented oxen, after the government-financed lease of a tractor expired. While the tractor is considered the most efficient way of ploughing, the cooperative does not see itself in the position to finance 1000 Birr per day for rent. Sesame sowing, weeding and harvesting is done manually. The production process is not mechanized.

After harvest, the corporation stores the sesame in their warehouse to wait for sesame prices to rise. The sesame is transported to the ECX local branch office, which enables the cooperative to obtain prices exceeding prices offered by local traders by roughly 200 Birr per quintal. Apart from sesame grown on communal land the cooperative also purchases privately grown sesame from members as well as from independent farmers to re-sell it at higher prices. Of the profits made, the corporation by law is required to retain 30% as a reserve. The remaining profits are paid out as dividends to members. The reserve of Metekel's primary cooperative currently totals 30,000 Birr. In 2010 the cooperative produced 50 tons and bought an additional 100 tons. 40 tons of the additional 100 tons came from independent farmers and 60 tons from cooperative members owning private land.

Membership to the cooperative is not restricted. Yet, according to the board members, it is difficult to attract new members since most farmers are either not aware of the benefits or do

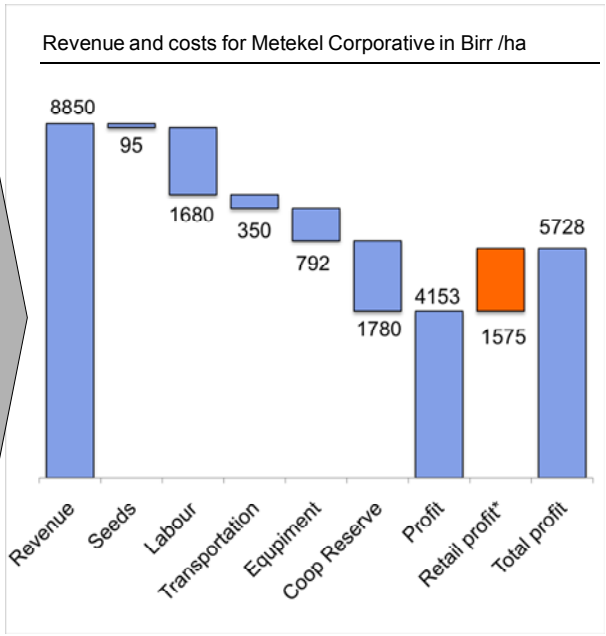
not trust the cooperative. The reluctance of farmers to join may also be due to the fact that most farmers prioritize short terms gains over long or mid-term benefits. In addition the benefits of a cooperative largely depend on the capability of the board members in carefully using the reserve and managing the sesame retail business.

Figure 6 shows what the cooperative estimated to be a regular year's business case for sesame cultivation including additional income from re-selling 1000 quintals of sesame. In 2010 an ice-rain destroyed the entire crop, so figures are based on assumptions by the chairman of the board.

Figure 6: Revenue and cost structure in Metekel Cooperative's business model

Farmer member profits amount to 5,727 Birr / ha

- 5 quintal sesame per ha
- 1700 Birr per quintal
- 13,5 Birr per kg of seeds; 7 kg of seeds needed for 1 ha
- 84 man-days needed per ha; labor provided by members of the corporative / rate of daily labor of 20 Birr
- Transportation cost of 10 Birr per quintal to corporative warehouse and 60 Birr per quintal transport to ECX
- Equipment includes ox (4 days per ha costing 150 Birr per day); cutting devices (120 Birr over 4 years), mats (250 Birr over 4 years; cleaning utensil (400 over 4 years) and plastics sacs for transportation (6 Birr per quintal)
- No fertilizer or pesticides used
- Additional income from retails profits of cooperative paid out to members in dividends



* Assumption: Income from sesame trade divided by total amount of ha farmed with sesame (100 ha)

Source: Metekel Primary Cooperative

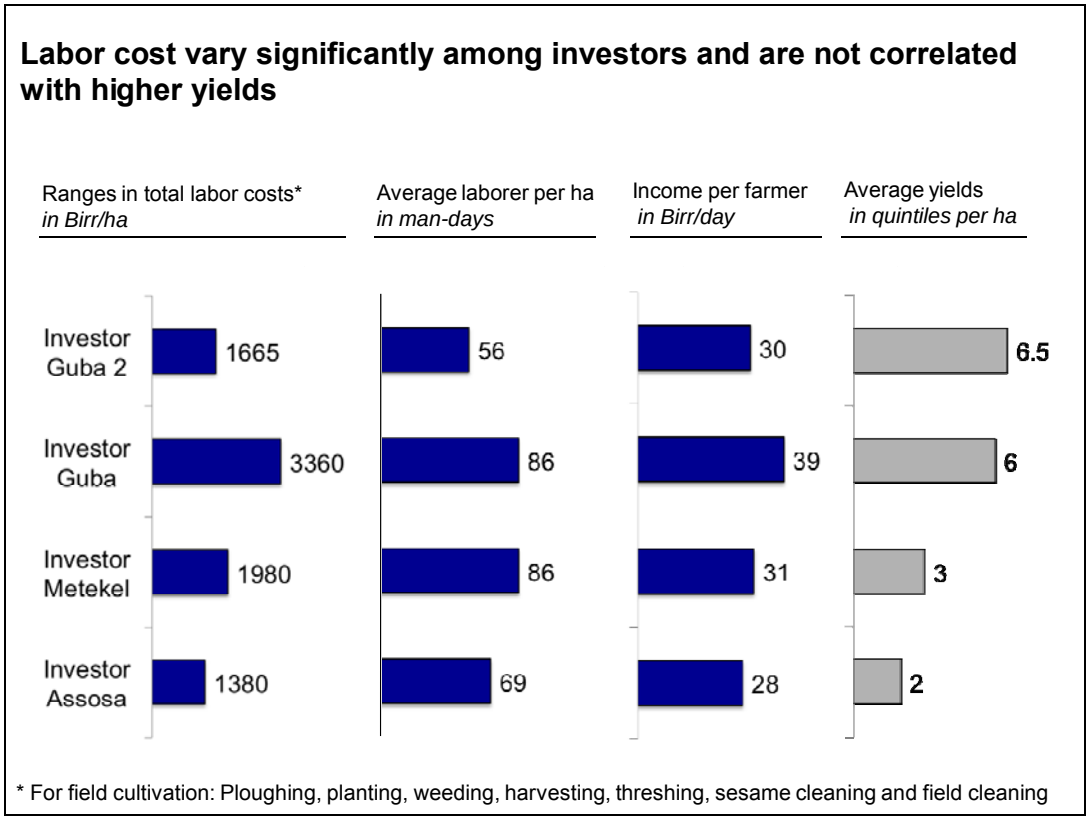
2.1.3 Income for laborers working on investors' farms

For the purpose of comparing the smallholder model and the communal land management model with large scale farming with respect to poverty alleviation, this report focuses on the potential income for farmers, i.e. on salaries paid to laborers on sesame plantations. While overall profits for the investor can be attractive, income for farmers through salaries was inferior to smallholders cultivating their own land. At the same time, daily labor proved to be a more reliable income thus involving less risk for livelihood security.

Investor case studies showed that sesame, under current conditions in Benishangul Gumuz, is not a crop that can be scaled easily. Reasons for difficulties are crop sensitivity especially during harvesting, as well as higher operating costs. If sesame is not harvested carefully significant crop loss of up to 50% can occur. When harvested too late, sesame pods risk shattering with sesame falling on the ground and thus being lost. Given the necessary sensitive handling of pods, harvesting sesame is labor-intensive. During peak harvesting times it can be difficult to find enough experienced labor to ensure just-in-time harvesting of pods. Higher operating costs are caused by technical equipment for ploughing on the one hand and higher labor costs on the other hand. While farmers mostly do not account for their own and friends' labor input, investors have to pre-finance paid workers for ploughing, weeding and harvesting. In addition paid labor cost a

premium during peak-harvesting times. Findings show that labor costs vary greatly between investors.

Figure 7: Labor costs and yield ranges on large-scale sesame farms



Source: Interview with large-scale investors in Metekel (including Guba) and Assosa

Investors reported that an increase in hectares cultivated leads to a decrease in yields per hectare since manual labor is most effective on small plots of land. An investor in Metekel achieved promising results of seven quintals per hectare when he farmed only two hectares of land. When he scaled production to 20 hectares and then 100 hectares his yields dropped to four and then three quintals per hectare respectively. He incurred a 30% crop loss due to the lack of diligent workers during harvesting. As a consequence the investor has now stopped cultivating sesame and is switching to maize. According to the investor, large-scale production in Ethiopia only makes sense, when 'harvesting is mechanized. Otherwise management of the workforce is too complicated'.

An investor from Guba was discouraged from his sesame harvest. Climatic conditions in Guba are attractive for sesame production and thus for investors, causing a high demand for sesame workers during peak times of planting, weeding and harvesting. In order to insure a sufficiently large labor force the investor pays his laborers on a contractual basis and up to three times as much compared to laborers in Metekel. Unlike most other investors who pay their laborers on a daily or monthly basis the Guba investor paid his staff by pods harvested and respectively by numbers of hectares weeded. As a consequence he hardly incurred any crop loss. He also relies on personal relationships to people from his tribe. Due to personal as well as contractual obligations this cost structure is difficult to scale down if harvest is disappointing.

While some investors have been reported to stop cultivation of sesame due to disappointing results, sesame – like any other crop – does have a potential for large-scale farming. Investors already have some comparative advantages due to better-managed soils and easier access to high-quality seeds. In addition, as shown by examples in the USA, sesame cultivation can be fully mechanized. Having said that,

investors in Ethiopia currently shy away from substantial investment in such technology. As long as mechanization remains low, the potential for profitable large-scale cultivation seems limited especially with labor costs rising. In the near to mid-term future sesame is thus likely to remain a 'smallholder crop'.

Two final comments are in order. First, this analysis does not necessarily apply to other crops, in particular not to crops that are suitable for higher degrees of mechanized cultivation. Second, the authors of this report assess the overall contribution of the large-scale investor model to livelihood security of laborers as somewhat better compared to the smallholder model. The reason for this assessment is that sesame as a crop is not cultivated for consumption. It is solely a cash crop. When the crop is lost this equals a monetary loss. If investors incur crop loss, the laborer has a higher change to substitute for this loss by switching to work on other crops than the farmer has. The emphasis of this report lies on the contribution of sesame farming, and not whether the overall situation of a farmer is better or worse compared to the situation of a laborer.

2.2 Climate resilience

This section examines the extent to which the different business models are able to cope with climate change. Business models are scrutinized based on their respective adaptive capacity to build assets and climate robust income portfolios.

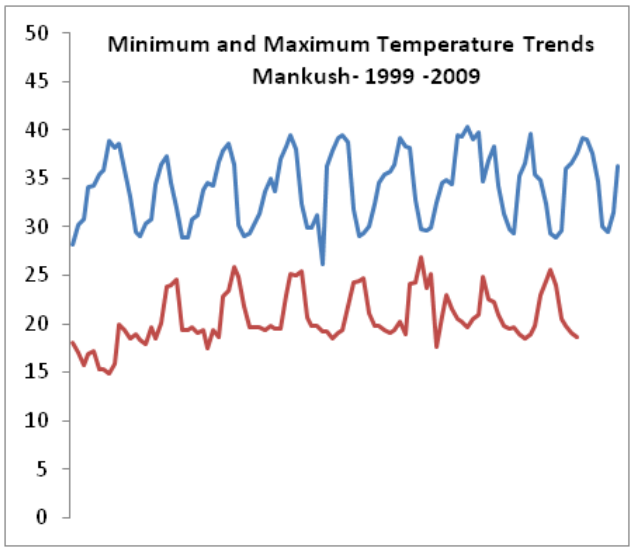
2.2.1 Changing climate in Metekel and Assosa

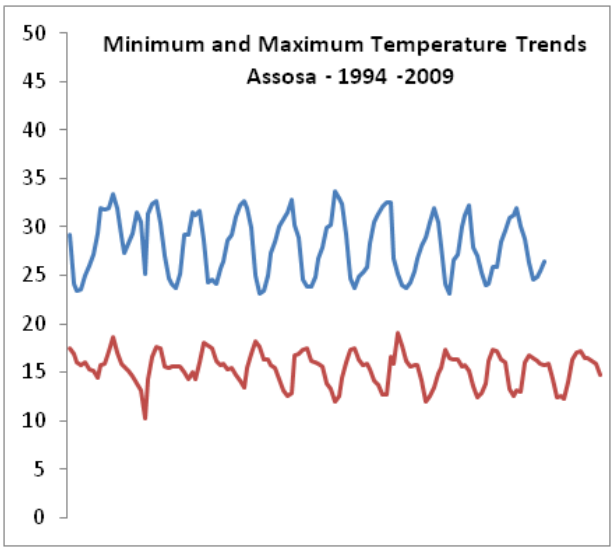
Over the last few years, sesame farmers in Metekel and Assosa reported an increase in temperatures, erratic rainfall, and weather hazards such as windstorms and 'ice-rain', all having a severe impact on their sesame crop. Farmers tend to attribute these occurrences to a structural shift in climate conditions. This perception however, is not supported by the data gathered from the National Meteorological Agency. Looking both at temperatures and rainfall since 1994, neither frequency nor intensity have changed. The tables below show minimum and maximum temperature as well as precipitation (rainfall) trends in Mankush and Assosa in Benishangul Gumuz district.

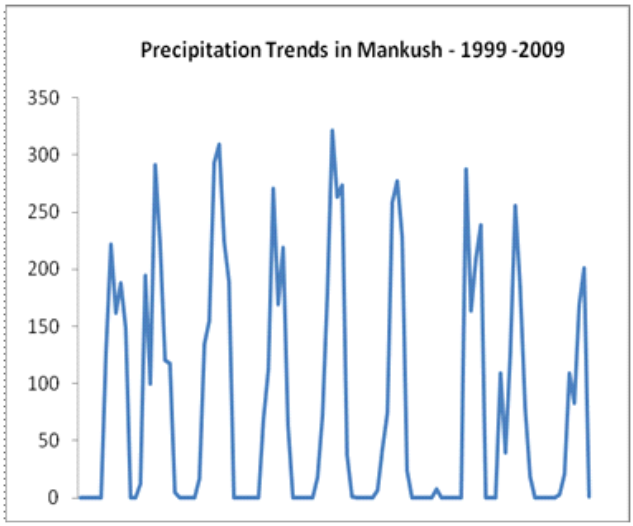
However, sesame is a plant that is particularly sensitive to weather hazards, regardless of whether these hazards are due to climate change or due to 'normal' rainfall and temperature variances. Sesame needs around 10–20 days of rain. Heavy rain and rising humidity can damage the sesame plant exposing the leaves and pods to blight and other fungal diseases. Farmers consistently reported sesame crop losses between 25 to 100 percent during the last two years.

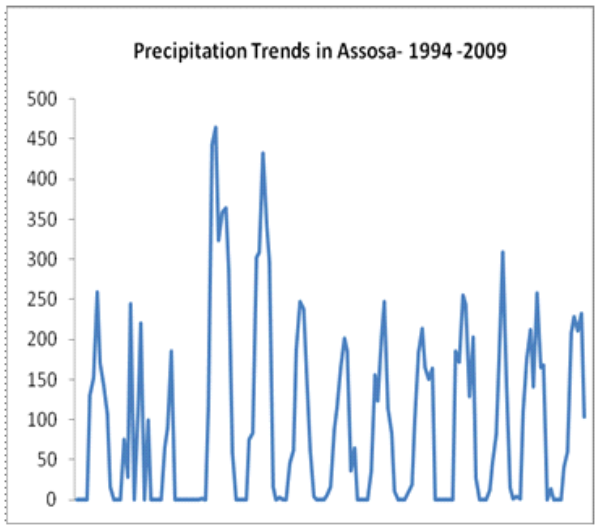
Sesame crop losses result in declining household income for independent farmers and lower dividends for farmers of communal land. Crop losses also affect farmers working as hired labor. If weather hazards destroy investors' crops, it can lead to a sudden decline in labor demand and early contract termination. Temporarily hired labor will be out of work and their salaries are likely to decline. Therefore, even in the absence of visible climate change, the capacity of farmers to adapt their business model to weather hazards is paramount for securing farmer livelihood. Improvement in this area would not only help farmers to address current weather hazards but it would also prepare them for potential future climate change.

Table 4: Minimum and maximum temperatures in Mankush and Assosa









*Note: *Rainfall occurred annually but the length of rainfall period varied across years.*
Source: National Meteorological Agency, Addis Ababa

2.2.2 Adaptive capacity across business models

The Africa Climate Change Resilience Alliance (ACCRA) consortium has identified characteristics of adaptive capacity to analyse people's own adaptive capacity in the face of a combination of hazards and stresses and to analyse how different programming approaches either support or hinder adaptive capacity. Drawing on these characteristics the following aspects of climate resilience are relevant in the context of sesame farming in Benishangul Gumuz:

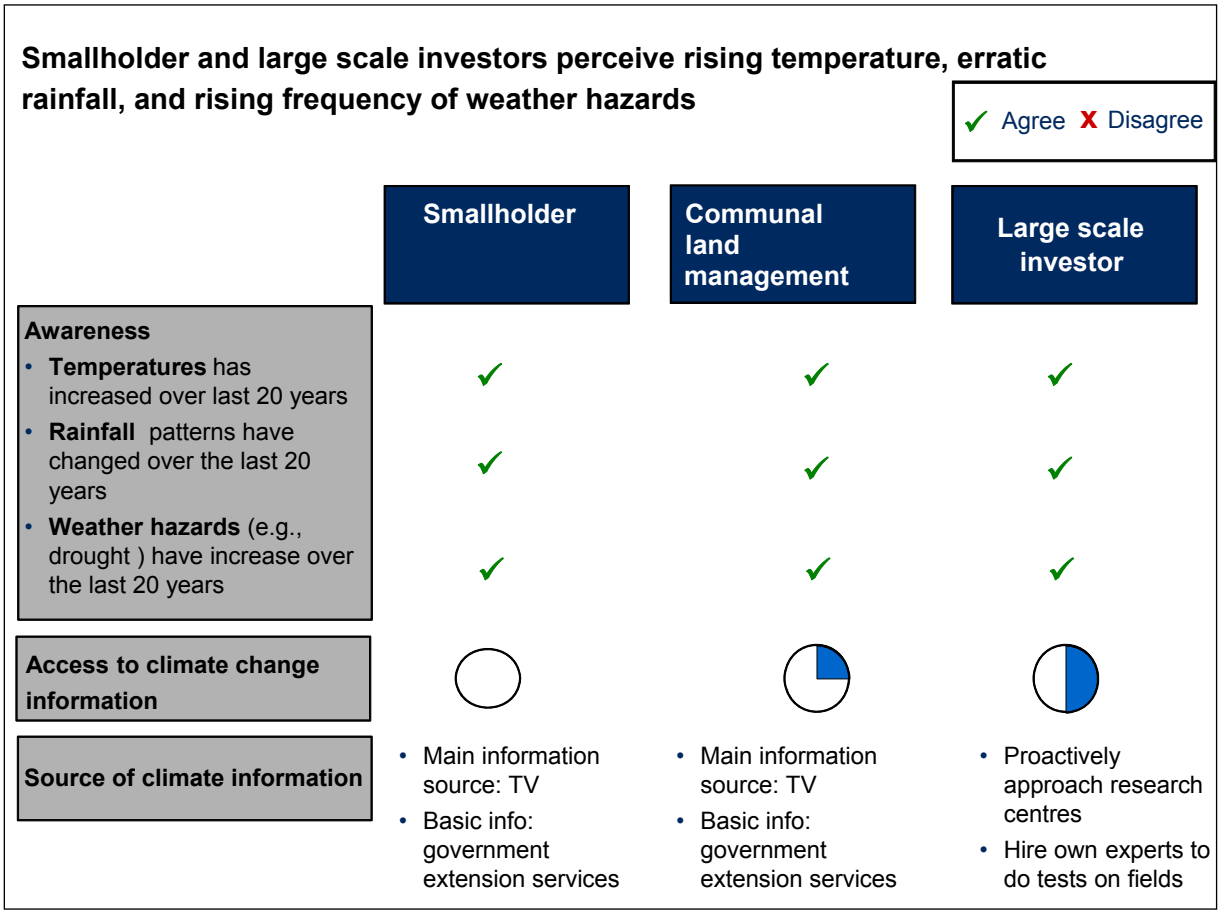
- *Awareness and access to information*: Farmers in the respective business models are aware of shifts in weather patterns and have the ability to collect and analyze relevant information on climate change and adaptive measures.
- *Asset base*: Availability and interplay of key assets that allow farmers in the respective business models to respond to evolving circumstances in a changing climate.

- *Innovative measures*: Farmers in the respective business models create an enabling environment to foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities.
- *Institutions and entitlements*: Institutional environment that allows equitable access and entitlement to key resources.

Awareness and access to information
In order to respond to changing weather conditions farmers in the respective business models need to be aware of potential risks associated with these changes. In order to make informed decisions farmers have to have access to information on climatic conditions and on potential adaptive measures they can take to address these.

Generally speaking, sesame farmers in Metekel and Assosa are aware of recent weather hazards (Figure 8). All farmers indicated that they had observed changes in temperature, rainfall patterns and other weather hazards over the last 20 years.

Figure 8: Awareness of climate change



Source: Interviews with farmers and investors; local agricultural and research bureaus

Despite awareness of weather-related challenges, farmers across all business models were uncertain if and how to respond. All sesame farmers complained about the lack of region-specific climate information and advice on adaptive measures to take. Smallholders as well as communal land farmers in Benishangul Gumuz solely rely on publicly available information. They learn about climate change predominantly from radio or TV and are waiting for local government extension services and research centers to provide guidance. Organized farming groups and investors have approached local government research centers in the past, but did not receive helpful information. To compensate for this lack of information on adaptive measures such as sesame seeds

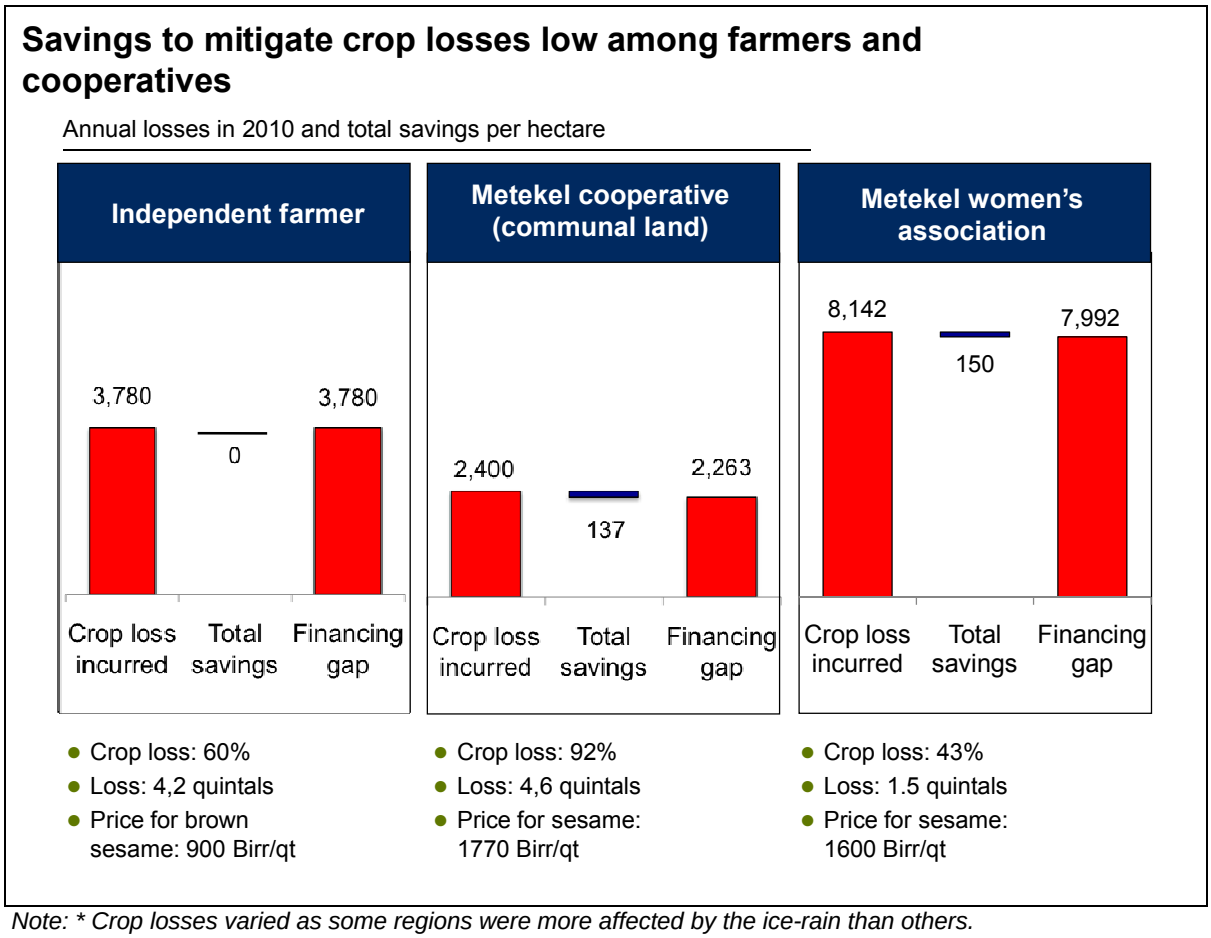
suitable for local weather and soil conditions, large-scale investors started to hire their own climate and agronomic experts.[9]

Asset base

The responsive capacity to weather-induced crop loss varies between smallholder and large-scale sesame farmers due to differences in asset accumulation. For the purpose of this report, asset base is defined as financial capital, including accumulated household savings, communal savings, and access to financial loans.[10]

Farmers who are working independently often have no financial savings, while some communal cooperatives or women associations have at least a small cushion (Figure 9). The responsive capacity of paid laborers on sesame plantations is similar to that of independent farmers. However, in case of crop loss paid laborers often have the option to respond by switching to other crops or regions.

Figure 9: Savings to mitigate weather-induced crop losses*



*Note: * Crop losses varied as some regions were more affected by the ice-rain than others.*
Source: Farmer interviews

[9] Interviews with local research centers and agricultural government bureaus confirmed the perception of farmers. Research centers and government bureaus do not have climate impact data nor did the acquisition of such information seem to be a key priority. To some of them climate change is not a major threat to sesame production in Benishangul Gumuz. According to the Metekel Agricultural Research Centre, climate change will not have a big impact on sesame production in Metekel. The Assosa Agricultural Research Centre seemed to be more active, currently conducting field-testing on sesame varieties suitable for the region. Field-testing include tests for early maturing sesame seeds that can reduce the maturity time of sesame from five months to three months, lowering sesame plants' exposure to unpredictable weather.

[10] In addition to financial resources, other possible resources that can be taken into account include natural, physical, and human capital.

The potential to build-up an asset base also varies significantly between business models. Large-scale investors tend to achieve higher total profits due to the amount of land they cultivate. In addition they have access to credit through banks. Both allow them to build up an asset base to cushion the impact of weather hazards and potential climate change in the future. Smallholders tend not to have these opportunities. Their total land and thus total profits are small and often do not suffice to cover minimum income requirements. The lack of finances often is exacerbated by a non-saving mentality. Smallholders' potential to build up savings independently is thus limited. In this context cooperatives and unions can play an important role. Due to the legal requirement of retaining 30% of all profits made as a reserve, they have assets that can be used for hardships loans in case of weather hazards. Organized farmers are therefore more climate change resilient than independent, unorganized farmers. [11]

Farmer profiles: Impact of climate change on farmers' livelihoods

Independent farmer

"The sun is getting stronger. The majority of last year's sesame crop was destroyed because of windstorms and ice rain. I had also planted maize, which became the main source for survival. It was good that I had planted a crop that we can eat."

Farmer in cooperative

"Because of the ice rain, I have lost my entire sesame crop for two years in a row. My goat was also flooded away by the heavy rain. In addition, a year ago a wild bush fire destroyed my house. As a member of a cooperative, I received 1,000 Birr from the cooperative's reserves last year."

Farmer in women's association

"The sun is getting very strong in the afternoon, making it difficult to work at noon. I also lost half of my sesame crop due to the rain. With no income from sesame, I had to rely on the sales from sorghum and millet. I don't have any savings."

Source: Farmer interviews

[11] Different farmer organizations display different amounts of savings: The Metekel Women's Association No. 1 had a total saving of 20,000 Birr; the Metekel Women's Association No. 2 had a total saving 6,100 Birr for 45 hectares of communal land and 163 members; the Metekel Cooperative had saved 30,000 Birr for 200 hectares of land and 120 members; and a primary cooperative in Assosa had saved in total 239,000 Birr for 246 members.

Innovative measures

In addition to varying abilities to build financial cushions and access climate information, farmers' current and future adaptive capacities also differ with respect to their ability to introduce innovative measures. Most relevant innovative measures in the context of sesame production in Benishangul Gumuz are: introduction of new farming practices, change of crops, and income-creation from additional livelihoods. Figure 10 shows current and future adaptive measures for the three business models. Farmers were asked (1) which measures they currently undertake and (2) which measures they can undertake by their own means in the future.

Figure 10 shows that large-scale investors are only slightly better positioned to introduce new measures to adapt to weather hazards and structural climate changes. However, having the possibility to introduce innovative measures is not enough. Adaptive capacity depends upon whether these innovative measures will actually be implemented. From the interviews it became clear that investors have a higher implementation capacity than smallholder farmers. Not only do investors have the financial means to invest in new farming practices and alike, they – in general – are also better organized, more driven, and educated. In addition, investors tend to be profit-maximizing and more open-minded towards change and thus more likely to utilize available adaptive measures.

Figure 10: Implementation capacity for innovative measure for sesame crop

Adaptive capacity differs across three business models

✓ adapted X not adapted

	Smallholder		Communal land management		Large scale investor	
	Current measures	*Future measures*	*Current measures*	*Future measures*	*Current measures*	*Future measures*
Changing farming practices						
Use different seed varieties	X	✓	X	✓	✓	✓
Change planting dates	✓	✓	✓	✓	✓	✓
Inter-cropping	✓	✓	✓	✓	✓	✓
Irrigation	X	X	X	X	X	✓
Changing crops						
Plant different crops	✓	✓	✓	✓	✓	✓
Additional livelihoods						
Extension of livestock	X	✓	X	✓	X	✓
Create non-farming income	X	X	X	✓	X	✓

Source: Interviews with farmers, team analysis

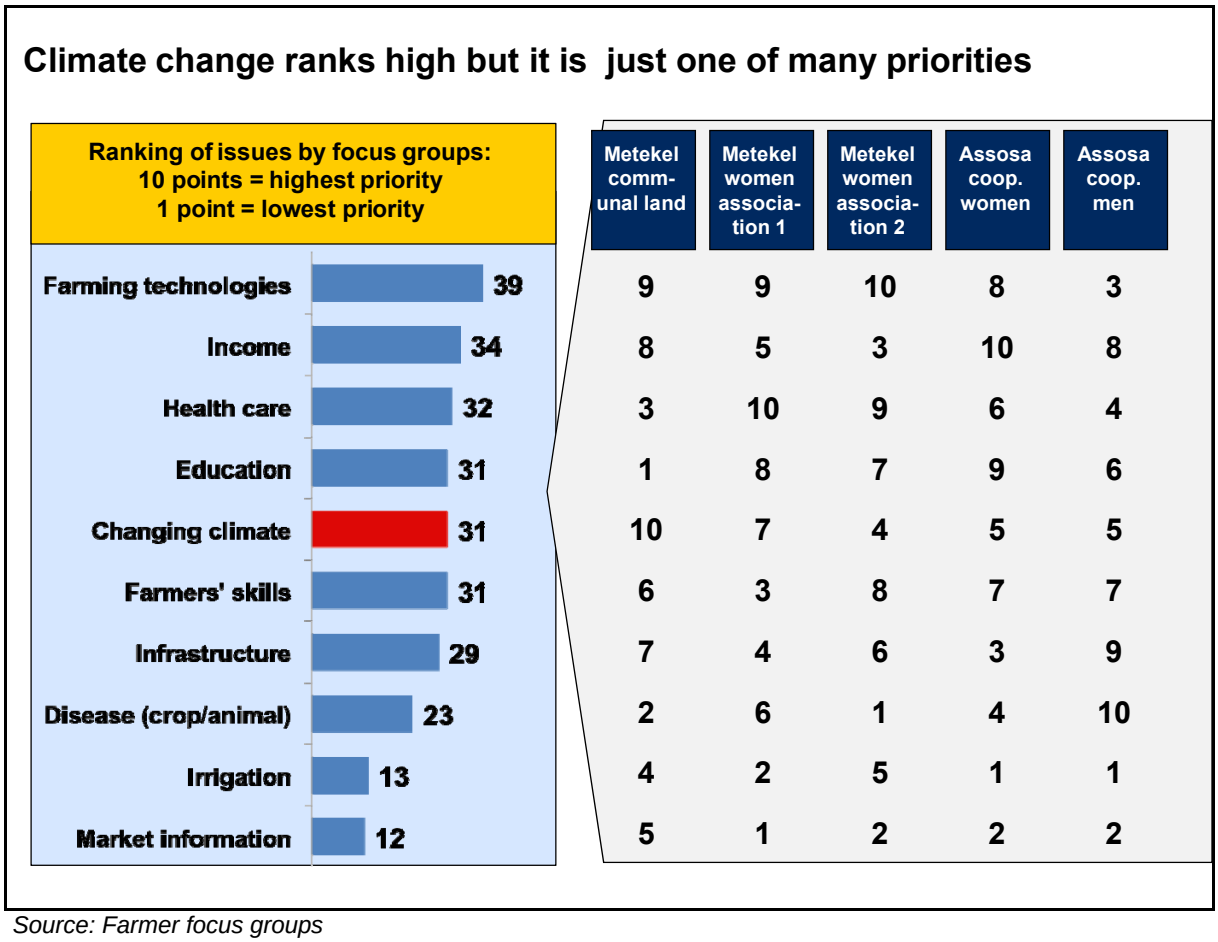
Among independent farmers, only measures considered 'low-hanging fruits' have been adopted so far. The most common adaptive measure is multi-cropping. The majority of farmers plant at least two to three different crops with different planting schedules. For example, in response to the ice-rain in 2010, many farmers partially replaced sesame with millet, maize or sorghum, which are more weather-robust. Along with shifting rain patterns, farmers have also changed planting time for sesame from May/June to June/July. In addition, farmers are practicing inter-cropping sesame and sorghum. The sorghum plant is taller than the sesame plant and can act as a protective shield against rain. Many other adaptive practices are difficult for smallholders to initiate as these measures require additional investments, skills, and willingness to change long-practiced

routines. In comparison, large-scale investors face lower barriers for implementation. Some large-scale investors even indicated that they are considering testing potentially costly irrigation systems and purchase climate resilient seeds in the future.

In summary, some of the adaptive practices can easily be managed by all farmers, such as changing crops, inter-cropping, and changing planting dates. Other measures such as increasing non-farming income require the creation of new ideas and a general willingness to adapt, learn, and fail. Finally, measures such as extension of livestock or introducing irrigation technologies require access to finance.

In order to understand the degree to which farmers are willing to actually undertake adaptive measures it is important to assess the relative importance of climate change to farmers (Figure 11).

Figure 11: Ranking of priorities



Source: Farmer focus groups

Findings showed that farmers prioritize immediately tangible problems such as lack of farming technologies, low income, health care and education over “God-given” circumstances they feel unable to change. Farmers often commented on weather hazards as ‘there is nothing they can do, it comes from the devil’. Where farmers prioritized climate change, this was mostly because of recent high crop losses due to weather hazards. For example, the Metekel Primary Cooperative, which ranked climate change highest, lost 92% of the sesame crop in 2010 because of ice-rain.

Given these priorities, it is not surprising that farmers across all three business models so far have only taken minimum measures to adapt to the changing climate. They tend to use financial assets – if available – for other more short-term oriented purposes. For example, primary cooperatives spend their reserves on buying new oxen, opening a local consumer shop, or offering hardship funds to cooperative members rather than improving adaptive capacities.

Institutions and entitlements

Furthermore, effective climate change adaptability relates to a system's ability to ensure equitable access and entitlement to key resources and assets. In particular women tend to be underrepresented in community institutions which can result in unequal access and distribution of key resources. In Metekel and Assosa, women's access to resources and their participation in local institutions need further improvement across all business models, further discussed in the following section.

2.3 Empowerment of women

The main findings are that women in Benishangul Gumuz are marginalized in sesame cultivation as they are expected to manage household labor and thus face a double work burden.

The smallholder model is more fitting for women since it allows them to manage their double workload burden according to their needs. However, women in the smallholder model are excluded from the sales process and are underrepresented in boards of primary cooperatives. General benefits in the smallholder model might not directly translate into benefits for women. Therefore, the smallholder model needs to be combined with equal representation of women as functional members of boards of primary cooperatives. Currently they hold mostly nominal positions if at all.

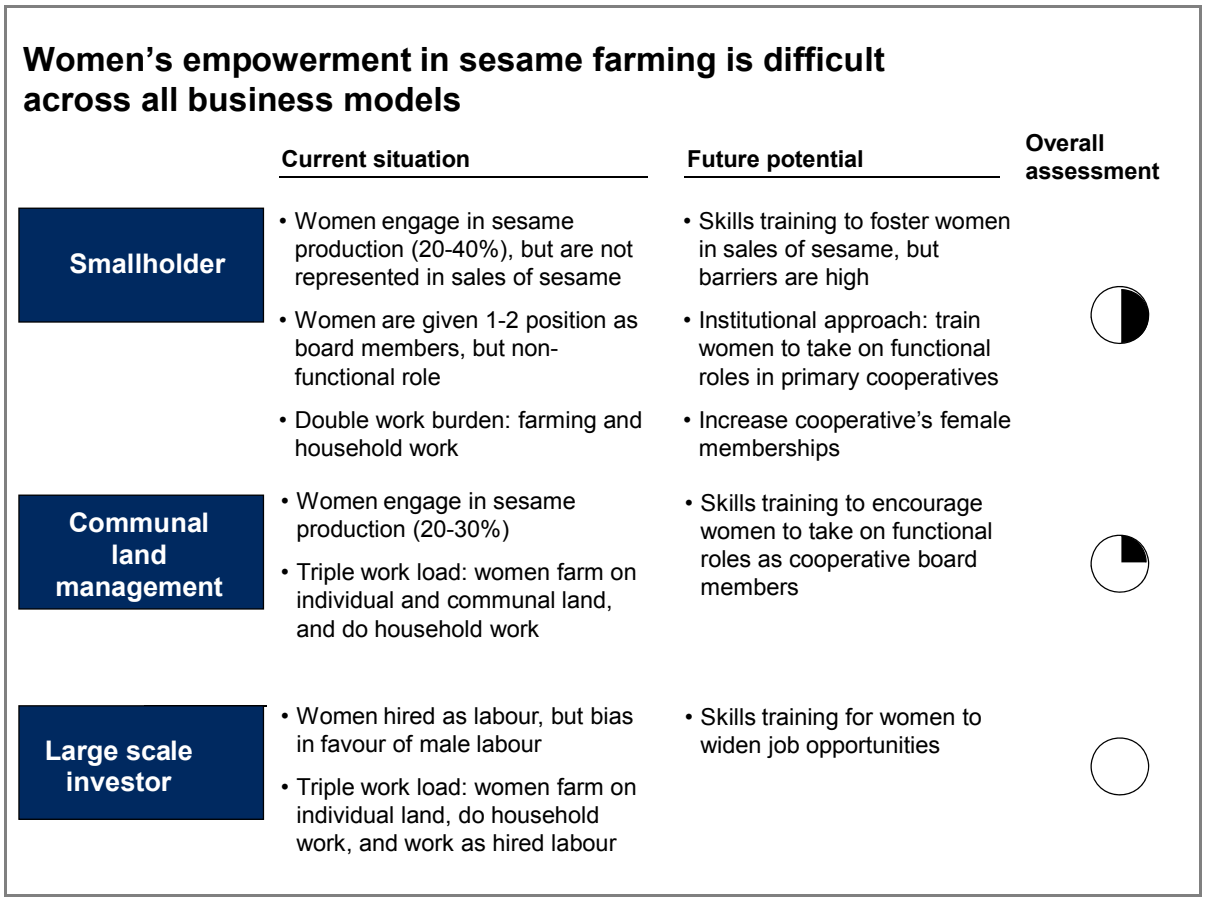
Communal farming is not necessarily more attractive to women than independent farming. Examples from women's associations in Metekel illustrate this. Initially these women's associations were founded to address women's health issues, but have recently started to enter agricultural activities. This mission creep resulted in a triple work burden, namely being in charge of independent land, communal land, and household work.

Case study: Metekel Informal Women's Association No 1

Triple work burden: One of the challenges for the women's association in Metekel is the triple work burden: women are expected to farm the individual land, work on the communal land on Wednesday, Saturday, and Sunday, and manage a household with on average of four children. Given this heavy work burden, work on communal land can often be an additional work burden.

Working as daily laborers on large-scale farms is particularly disadvantageous for women, as they are absent from their homes thus having to cope with household labor and potentially farmland responsibilities after returning from their workday. Also, female farmers working as paid labor on commercial farms face a number of social barriers. Although a number of investors reported that women are 'equally good' or 'even harder working than men', investors also admitted that there is a bias against women. The cultivation and harvesting of sesame is seen as work that is too hard for women.

Figure 12: Empowerment of women across business models



Source: Farmer interviews; team analysis

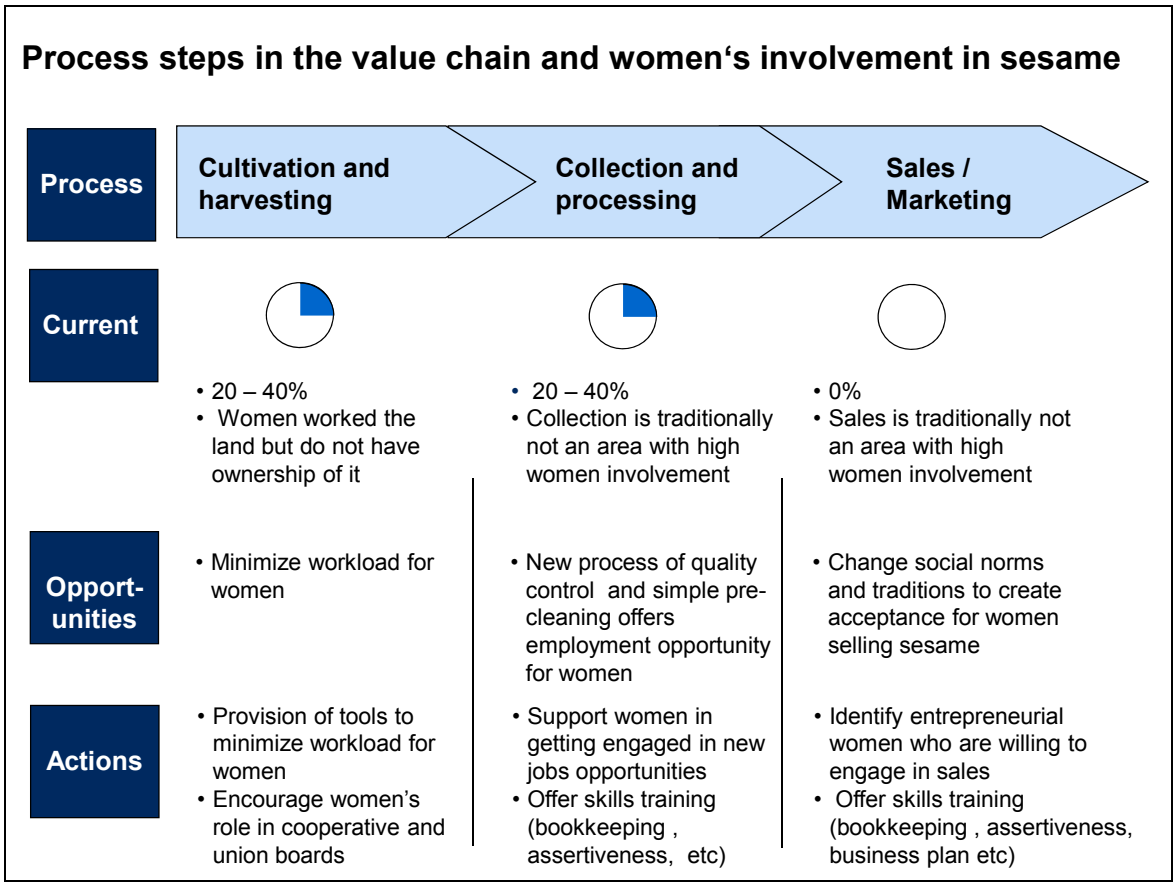
2.3.1 Women's control over revenues from sesame sales

In Benishangul Gumuz, opportunities for women are mostly seen in the smallholder model, yet, women are not represented in this model at each step in the value chain. Women are actively involved in ploughing, planting, weeding, and harvesting of sesame.[12] Estimates across different business model show that 20% to 40% of all sesame laborers on the field are women (Figure 12). Despite their involvement in production, women are absent from the sales process. As a consequence it is difficult for

[12] This study also analyzed possibilities to create new business opportunities for women, such as cleaning of sesame seeds, quality control, as well as new value added services. Based on a supply chain analysis the cleaning of sesame is best and most effectively done by large-scale cleaning and sorting machines, since the quality achieved by local manual cleaning does not suffice to meet industry standards. The findings also suggest that sesame might not be the best crop for women's empowerment through additional value-added services. Assosa Union is planning to produce sesame oil. Yet, unlike oil from niger seeds and peanuts, sesame oil is too expensive for the domestic market and will be exported to foreign markets thus offering only limited opportunities for women to act as local traders. Similarly, only few jobs will be created in processing sesame oil since – if destined for export – the processing is likely to be fully mechanized.

women to control financial resources. Men manage the sales process because according to both female and male perceptions, men can get better prices. Some male farmers reported that they directly hand the money from sesame sales over to their wives, as women are better in money handling and do not spend the new income on alcohol.

Figure 13: Women work the field but don't earn the benefits



Source: Adapted from 'Methodology for Value Chain Development and Private Sector Engagement', Oxfam GB, March 2010; team analysis

2.3.2 Representation in farmer organizations

In addition to being excluded from controls over revenues from sesame sales, women are underrepresented in farmer organizations. None of the interviewed primary cooperatives was chaired by a woman nor were women holding functional positions as board members, by for instance, taking on the position of a treasurer or controller. Women mainly held representative functions to fulfill official gender requirements. The cooperative where women were most included was the Metekel Primary Cooperative, with two of seven board members being women. This emphasis on women came from the urgent need to attract additional members to farm the 200 hectares of communal land that the cooperative had been given by the government. Women were given two positions as board members to win other female farmers as cooperative members.

Women are also underrepresented at the membership level. Only 20 of 120 members in the Metekel Primary Cooperative are women. Similarly, only 1,363 out of 6,375 members of Assosa Union are female. Female membership thus only amounts to around 20%.

Case study: Metekel Informal Women's Association No. 2

Lack of commitment and coordination problems: Metekel Women's Association No. 2 came into existence in 2005, with a total of 160 female members. The association farms 45 hectare, of which 7 hectares are planted with sesame. Members are divided into three groups, farming 15 hectares each. The schedule for planting, weeding and harvesting of sesame is on a voluntary basis. Due to this volunteer-based working schedule, lack of commitment and coordination failure are key emerging problems for the association. With no regular working schedule, finding enough volunteers during peak farming times is difficult as members also farm their own land and have household responsibilities.

Lengthy decision-making process: The revenues from sesame of the women's associations up to now have been very low and over the last years, only a modest amount could be saved. In total 6,100 Birr of profits have been accumulated and are currently kept in the bank. Members of the association plan to invest this money in a donkey, but since the last year, no investments were undertaken. This seems to be due to a decision-making process that involves all members. Risk-aversion of some members can thus delay badly needed investments in productivity enhancing equipment.

3 CONCLUSION

This study investigated the productivity, resilience, and sustainability of small-scale and large-scale sesame farmers in Benishangul Gumuz. The findings only refer to the specificities of the sesame sector in Metekel and Assosa and cannot be applied to other crops or other regions of Ethiopia.

3.1 Findings

The authors of this report examined the strengths and weaknesses of different agricultural business models in sesame production and their contribution to poverty alleviation, livelihood security, climate resilience, and women's empowerment.

Findings show that sesame is a suitable crop for poverty alleviation for smallholders in Metekel and Assosa in Benishangul Gumuz due to high profit levels and its opportunities for women's empowerment. Currently the smallholder model is competitive versus the large-scale investor model because of a lack of mechanization. The techniques of investors to date are similar to those of smallholders. However, if mechanization of sesame cultivation can be improved, this is likely to change. Sesame is a very delicate crop that makes such improvements costly and difficult to implement in the current business environment in Benishangul Gumuz.

Contribution to poverty alleviation and livelihoods

- The case studies examined demonstrate that income for sesame farmers in Benishangul Gumuz vary significantly depending upon whether they work on their private land, on communal land or as laborers on an sesame plantation of an investor: While an independent farmer earns between 386 and 5.846 Birr per hectare, a farmer working on communal land earns between 1.472 and 4.733 Birr per hectare. By comparison, salaries for temporary laborers working on a plantation range between 504 and 1.172 Birr per laborer per season.
- While the contribution to income levels can be highest in the smallholder farmer model, it also can leave the farmer most vulnerable to external shocks and crop losses if the farmer fails to build up reserves, i.e. through paying into cooperative reserves or other saving mechanisms.

Improving resilience to climate change

- The adaptive capacity of the various business models differs in terms of their ability to build assets and climate robust income portfolios. The resilience to crop loss varies, according to farmers' access to household savings, communal savings, loans, or other non-farming income.
- In the absence of a primary cooperative structure, independent smallholders are least likely to accumulate assets that can help cushion unexpected weather hazards and undertake adaptive measures for climate change.
- Large-scale investors on the other hand have better access to savings and loans to mitigate climate change risks. However, this does not necessarily benefit paid laborers working for investors' fields as they are hired on a day-by-day basis with no minimum income security.

Supporting the empowerment of women

- In Benishangul Gumuz, opportunities for women are mostly seen in the smallholder model, which allows women to manage their double workload burden according to their needs. However, benefits of the smallholder model do not directly benefit women in it as women are currently marginalized in the sesame sector. The smallholder model is attractive if the position of women is further strengthened by

engaging women also in the sales process of the crop and with an equal representation of women as functional members of boards of primary cooperatives.

- Communal farming is not necessarily more attractive to women than independent farming because women face a triple work burden, namely being in charge of independent land, communal land, and household work.
- Working as daily laborers on large-scale farms can also be disadvantageous for women, as they are absent from their homes and have to cope with household labor and potentially farmland responsibilities after returning from their workday.

3.2 Role of Oxfam

Oxfam can support the sesame sector in Ethiopia through (a) program delivery on the ground, and (b) policy advocacy and campaigning work to influence policies and related practices of the Ethiopian government, business sector, and the donor community.

Programme delivery

Oxfam can play a constructive role by raising awareness that sesame is a suitable crop for smallholder cultivation, strengthening primary production cooperatives, promoting women's empowerment in the sesame supply chain, and generating new ideas with respect to potential market innovations:

- Oxfam can raise understanding that optimal ways to increase production differ across crops. While a large-scale investor model is often best suited to improve productivity, this is not necessarily the case in sesame. Increases in productivity are usually due to fertilizer and mechanization, both of which are not applicable to the sesame sector under current conditions in Benishangul Gumuz. Oxfam can act as a facilitator to ensure that smallholders continue to play an important role in improving sesame productivity in Benishangul Gumuz.
- Findings of this report indicate that primary production cooperatives are crucial for making the smallholder model work, in particular for addressing challenges of livelihood security and climate change. Oxfam can facilitate trainings of primary cooperatives board members. Among others, the training should raise awareness that better farming practices are not only good for income but also necessary to ensure food security and to mitigate climate change risks.
- Overall, the report shows that the best way to empower women is to increase women's participation in boards of cooperatives or unions. Furthermore, Oxfam can foster solutions ensuring that women are engaged in the sales of sesame.
- Finally, Oxfam can promote innovative ideas and market linkages to support the sesame sector in Benishangul Gumuz. For instance, Oxfam can facilitate developing risk management strategies such as weather-based micro-insurance for smallholder farmers or assess options for contract farming for paid labor. Oxfam can also help create linkages to the private sector through value-added activities by cooperatives or unions.

Policy advocacy and campaigning work

- Oxfam can influence policies and related practices of the government, business sector and the donor community in favor of smallholders and women farmers. The findings of this report can be used to discuss with other shareholders how best to strengthen the position of smallholder and women farmers in Ethiopian's sesame sector.
- In addition, Oxfam can engage in policy advocacy for sesame laborers working on commercial farms. In view of the Ethiopian Government's increased focus on agricultural commercialization in the next five years, an increasing number of farmers, pastoralists and women will turn into laborers. Oxfam should help to highlight potential risks associated with switching from independent farming to be hired labor. Key areas of advocacy include:

- As highlighted by this report, the majority of women cannot give up household duties to take up employment requiring them to live outside their homes. The commercialization of sesame farming thus further marginalizes women in the sesame sector. Oxfam and other stakeholders should ensure that commercial farming also offers benefits to women by finding optimal contract models that allows women to combine paid labor with family duties.
- Switching from independent farming to hired labor possibly destroys farmers existing food safety nets that guarantee farmers' minimum livelihood. Currently farmers also grow crops for their own consumption, and if farmers start to work as paid labor, they can no longer rely on this food safety net.
- Two risks need to be addressed particularly: first, if food prices rise, paid laborers might not be able to afford basic food and they might be considerably worse off than independent famers. Second, in case of a sudden decline in investors' labor demand due to weather hazards or crop disease, paid laborers currently do not have savings to bridge months of no employment. Oxfam can engage the private sector and other stakeholders to develop actions and practices to secure the minimum livelihood for paid laborer.

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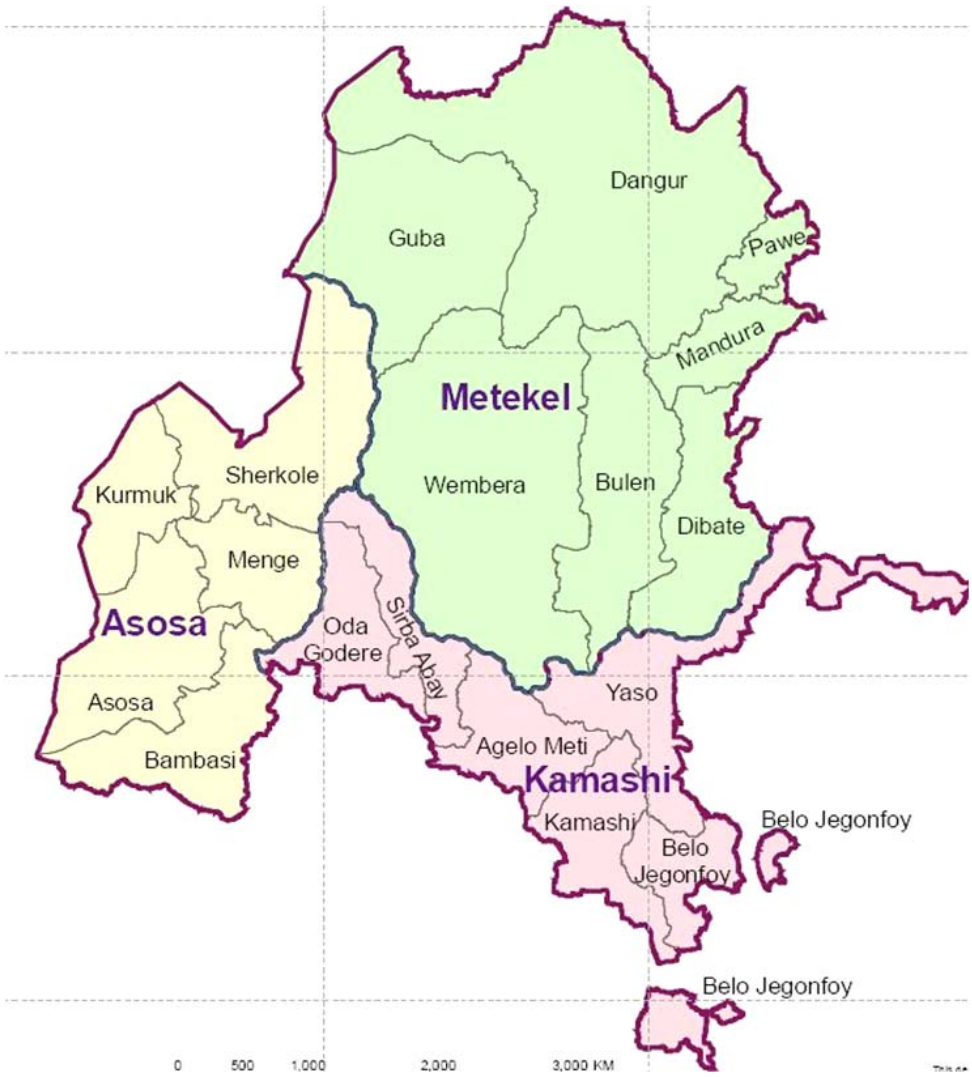
APPENDIX

Appendix 1: Sesame production area in Ethiopia

Source: 2009 Report: Role of the Ethiopian Commodity Exchange (ECX) in the Sesame Value chain in Ethiopia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Appendix 2: Interview list

No.	Date	Category	Name
1	18. April 2011	Communal land farming	Metekel Primary Cooperative, interviews with seven board members (Chair and other board members)
2	18. April 2011	Communal land farming	Three farmers, members of the Metekel Primary Cooperative
3	18. April 2011	Independent farmer	Four independent farmers in Metekel
4	19. April 2011	Communal land farming	Metekel Women's Association No. 1 (Women's Self Help Group)
5	19. April 2011	Communal land farming / independent farmers	Seven female farmers, members of Women's Association No. 1
6	19. April 2011	Government	Woreda/zonal Agriculture & Rural Development Bureau
7	19. April 2011	Research Centre	Pawe Agricultural Research Centre
8	19. April 2011	Trader	Local trader in Metekel
9	20. April 2011	Communal land farming	Metekel Women's Association No. 2 (Women's Self Help Group)
10	20. April 2011	Communal land farming / independent farmers	Six female farmers, members of Women's Association No. 2
11	20. April 2011	Investor	Java commercial investor in Dangur
12	21. April 2011	Investor	Guba commercial investor
13	22. April 2011	Primary cooperative	Assosa primary cooperative No.1, interviews with seven board members (Chair and other board members)
14	22. April 2011	Primary cooperative	Women trading group, members of primary cooperative
15	22. April 2011	Primary cooperative	Assosa primary cooperative No.2, interviews with seven board members (Chair and other board members)
16	23. April 2011	Farmers union	Assosa union board, interviews with seven board members
17	23. April 2011	Independent farmers	Three independent farmers in Assosa
18	23. April 2011	Investor	Three investors in Assosa
19	23. April 2011	Trader	One licensed trader/buyer
20	25. April 2011	Government	BG Regional Agricultural & Rural Development Bureau
21	25. April 2011	Research Centre	Assosa Agricultural Research Centre
22	25. April 2011	ECX	ECX Assosa
23	27. April 211	Investor	Large-scale investor in Guba
24	27. April 2011	Government	Meteorological Institute, Addis Ababa

Appendix 3: Interview guideline

GUIDELINE FOR INTERVIEW	Interviewer: Date of Interview: _____

Village : _____ Commune : _____ District : _____

General Questions

1. Number of people living in the household under the same roof: _____

2. Head of household: ❒ male ❒ female

3. % Share of household income from sesame: ❒ 0% ❒ >20% ❒ >40% ❒ >60% ❒>80% ❒100%

4. Total size of land that you farm on: _____hectare

5. Size of land on which sesame is cultivated: _____hectare

6. The land on which your farm, are you the: ❒ Owner ❒ Renter ❒ Other: …….

7. Are you: ❒ Member of a cooperative ❒ Member of a union ❒ Independent Farmer

8. How many farmers are members in your

- Cooperative: _____
- Union: _____
- Number of female members: _____

Revenue from sesame farming

9. Please fill in the table below, list prices for different sesame varieties planted last crop year (2010/2011)?

Variety grown (e.g. Adi, Hirhir)	Kg / ha produced	Kg/ha sold	Price (Birr/kg)	Time of selling (month)	Cleaned sesame; check if yes
					❒
					❒
					❒
					❒

10. % Share of cleaned sesame you sell: ❒ 0% ❒ >20% ❒ >40% ❒ >60% ❒>80% ❒100%

11. What are the main reasons for selling uncleaned sesame?	Agree Disag	ree
No financial means to invest in cleaning equipment	❒	❒
Cleaning better and cheaper done by processing companies	❒	❒
Other reasons: _____		

12. How much sesame did you sell at what time?	Green crop / Before harvest	Beginning of harvest	End of harvesting	During non-harvesting time
Share of your crop sold at each time	_____%	_____%	_____%	_____%
Price	____Birr / kg	___ Birr / kg	___ Birr / kg	___ Birr / kg

13. What are the main reasons for selling sesame crop early?	Agree Disag	ree
Cash income required	❒	❒
Lack of storage facilities	❒	❒
Fear of theft	❒	❒
Fear of diseases	❒	❒
Fear of weather hazards	❒	❒
Other: _____		

14. Please indicate the different prices of sesame you have sold in 2010 and % of crop sold to each buyer).

15. Buyer that you sold your sesame crop to	Price for sesame in Birr / kg	% of crop sold	Month of selling
Cooperative			
Union			
Trader 1			
Trader 2 (if exists)			
Trader 3 (if exists)			

Exporter			
Other: _____			

16. What are the main reasons for selling the sesame crop to your current buyer?	**Agree Disag**	**ree**
Only buyer in the region	❒	❒
Provides transport / collects crop	❒	❒
Family friend / long standing relationship	❒	❒
Contractual obligation	❒	❒
Others: _____		

17. % Share of crop you are obliged to sell to certain buyer because of existing contracts: ❒ 0% ❒ >20% ❒ >40% ❒ >60% ❒>80% ❒100%

18. Which of the following are main reasons for crop loss last year?	**No problem**	**Minor problem**	**Problem S**	**ignific ant Problem**	**% of crop lost**
Lack of irrigation	❒	❒	❒	❒	
Weather hazards (e.g. drought)	❒	❒	❒	❒	
Disease	❒	❒	❒	❒	
Poor crop maintenance (weeding etc.)	❒	❒	❒	❒	
Poor harvesting practices	❒	❒	❒	❒	
Theft	❒	❒	❒	❒	
Other: _____					

19. Please state below the different costs occurred in producing sesame	**Units T**	**otal expense for entire crop year**	**Not applicable**
Cost for seeds purchased	_____kg	_____ Birr	❒
Labor costs for crop year			
Ploughing	_____people	_____ Birr	❒
Planting	_____people	_____ Birr	❒
Weeding	_____people	_____ Birr	❒
Harvesting	_____people	_____ Birr	❒
Threshing and sesame cleaning	_____people	_____ Birr	❒
Cleaning of land	_____people	_____ Birr	❒
Number of hired workers	_____people	_____ Birr	❒
Number of household member involved in sesame growing	_____people	_____ Birr	❒
Other, please indicate …….	_____people	_____ Birr	❒
Input costs			
Fertilizer	_____Kg / liters needed	_____ Birr	❒
Water	_____Kg / liters needed	_____ Birr	❒
Pesticides / Herbicides / Insecticides (if applicable)	_____Kg / liters needed	_____ Birr	❒
Other, please indicate …….	_____Kg / liters needed	_____ Birr	❒
Equipment costs Total			
Ploughing (e.g. ox)	_____ pieces	_____ Birr	❒
Cutting equipment	_____ pieces	_____ Birr	❒
Plastic sheets for harvest	_____ pieces	_____ Birr	❒
Threshing and cleaning of sesame	_____ pieces	_____ Birr	❒
Packaging material	_____ pieces	_____ Birr	❒
Other, please indicate …….	_____ pieces	_____ Birr	❒
Transportation			❒
Car or truck purchase		_____ Birr	❒
Rented transportation		_____ Birr	❒
Public transportation		_____ Birr	❒
Other, please indicate …….		_____ Birr	❒
Other costs: _____		_____ Birr	❒

Farming Practices

20. Have you tried different seed varieties? ❒ yes ❒ no

21. Are you mixing different seeds? ❒ yes ❒ no

22. Which planting practices do you apply:

❒ Sesame thrown on the ground ❒ manual separate seed planting ❒ mechanized planting

23. Are you aware of differences between crop varieties? ❒ yes ❒ no

24. Have you received training on good farming practices? ❒ yes ❒ no

25. Have you received other government extension services? ❒ yes ❒ no

If yes, please specify: _____

26. Do you actively protect your soil? ❒ yes ❒ no

If yes, please specify: _____

27. Do you use fertilizer? ❒ yes ❒ no

28. If so, how much fertilizer do you use? ❒ yes ❒ no

29. If yes, how do you finance it? _____

30. Do you use machinery for weeding? ❒ yes ❒ no

31. Do you have any water collection / irrigation systems? ❒ yes ❒ no

32. Cost of irrigation system

Kind of system: _____

Cost for building / purchasing the system: _____Birr

33. Main obstacles for lack of irrigation system	**Agree**	**Disagree**
No access to finance	❒	❒
No need	❒	❒
No information on whether yields would improve significantly	❒	❒
Other (please indicate) ……..		

34. Harvesting: ❒ Manual harvesting ❒ Mechanical harvesting

35. Do you use equipment to collect sesame from broken pods? ❒ yes ❒ no

36. Where do you store sesame?

❒ no storage ❒ Own ❒ cooperative storage ❒ union storage

37. Are they sufficient? ❒ yes ❒ no

38. What are the main barriers for sesame market development?	Totally disagree	Disagree	Agree	Totally agree	No opinion
Access to market information	❒	❒	❒	❒	❒
Information on selling price in Addis Ababa	❒	❒	❒	❒	❒
Information on purchasing price of other buyers	❒	❒	❒	❒	❒
Availability of multiple buyers in your village	❒	❒	❒	❒	❒
Access to labour	❒	❒	❒	❒	❒
Government support through extension services	❒	❒	❒	❒	❒
Sufficient access to credit	❒	❒	❒	❒	❒
Other	❒	❒	❒	❒	❒
Other	❒	❒	❒	❒	❒
Other	❒	❒	❒	❒	❒

39. Reasons for credit refusal?	Yes	No
I have not requested credit so far	❒	❒
I have no collateral	❒	❒
I have bad credit history	❒	❒
Other: _____		

40. What kind of government support / extension service do you most need?

Service support needed _____

Service support needed _____

41. Of all problems with sesame cultivation, which is the most important obstacle for increasing your profit / income?

Most important obstacle for profits _____

Most important obstacle for profits _____

Climate change and resilience

42. Have you noticed the weather changing?	**Increased**	**Decreased**	**Stayed the same**	**Not applicable**
Temperature over the last 20 years has:	❒	❒	❒	❒
Rainfall over the last 20 years has:	❒	❒	❒	❒

43. Was there a large **drought** in your region, if so, when?

❒ 2007	❒ 2008	❒ 2009	❒ 2010	❒ no droughts ❒ I can't remember

44. What are other environmental hazards in your region?

_____

_____

_____

_____

45. Which of the following practices have you already used to respond to changing temperature and rainfall?	**Yes**	**No**	**Not applicable**
Plant different crops	❒	❒	❒
Use different crop varieties	❒	❒	❒
Changed planting dates	❒	❒	❒
Irrigation	❒	❒	❒
Extension of livestock	❒	❒	❒
Increase non-farming income	❒	❒	❒
Soil conservation	❒	❒	❒
Water harvesting schemes	❒	❒	❒
Move planting area	❒	❒	❒
I have done no adaptations	❒	❒	❒
Others : _____			

46. What are your main difficulties to adapt to changes in temperature and rainfall?	**Totally disagree**	**Disagree**	**Agree**	**Totally agree**	**Without opinion**
No barriers	❒	❒	❒	❒	❒
Lack of water	❒	❒	❒	❒	❒
Lack of information /knowledge	❒	❒	❒	❒	❒
Lack of farm animals	❒	❒	❒	❒	❒
Shortage of land	❒	❒	❒	❒	❒
Poor soil fertility	❒	❒	❒	❒	❒
Lack of farm inputs	❒	❒	❒	❒	❒
Lack of credit/money	❒	❒	❒	❒	❒
Shortage of labor	❒	❒	❒	❒	❒
Lack to farmer extensions	❒	❒	❒	❒	❒

47. Which of the following practices are you planning to use in the future to respond to changing temperature and rainfall?	**Yes No**		**Not applicable**
Plant different crops	❒	❒	❒
Use different crop varieties	❒	❒	❒
Changed planting dates	❒	❒	❒
Used irrigation	❒	❒	❒
Extension of livestock	❒	❒	❒
Increase non-farming income	❒	❒	❒
Soil conservation	❒	❒	❒
Water harvesting schemes	❒	❒	❒
Move planting area	❒	❒	❒
I have done no adaptations	❒	❒	❒
Others : _____			

48. In your community, what do you need to be able to respond to changing weather conditions?	Agree Disag	ree	Not applicable
Access to loans	❒	❒	❒
Access to livestock	❒	❒	❒
Build household-savings	❒	❒	❒
Community rules on water usage	❒	❒	❒
Better access to weather data	❒	❒	❒
Better access to technologies	❒	❒	❒
Others: _____			

49. Who can best support you in adapting farming practices to new temperatures and rainfall in the future?	Yes	No	Not applicable
No support	❒	❒	❒
Union	❒	❒	❒
Cooperative	❒	❒	❒
Extension services	❒	❒	❒
Government	❒	❒	❒
Local community	❒	❒	❒
Traders	❒	❒	❒
Others:_____			

Role of women in the community

50. What is the percentage of women involved at the different stages of sesame farming?	No women involved	1%–5%	5%–10%	11% – 15%	>15%	Not applic-able
Planting	❒	❒	❒	❒	❒	❒
Weeding	❒	❒	❒	❒	❒	❒
Harvesting	❒	❒	❒	❒	❒	❒
Collecting of harvest	❒	❒	❒	❒	❒	❒
Cleaning of sesame	❒	❒	❒	❒	❒	❒
Sales of sesame	❒	❒	❒	❒	❒	❒

51. What are barriers for women to engage in sales and marketing of sesame?	**Totally disagree**	**Disagree**	**Agree**	**Totally agree**	**Without opinion**
Ability to travelling	❒	❒	❒	❒	❒
Lack of sales/marketing network	❒	❒	❒	❒	❒
Ability to bargain for a good price	❒	❒	❒	❒	❒
Others :_____					

52. How many board members does your union have? ____members _____male _____female

53. How many board members does your cooperative have? ___members ____male _____female

54. What are most effective ways to involve women in the sesame production?	**Totally disagree**	**Disagree**	**Agree**	**Totally agree**	**Without opinion**
Give women access to credit	❒	❒	❒	❒	❒
Improve skills	❒	❒	❒	❒	❒
Increase female board members	❒	❒	❒	❒	❒
Create women's only cooperatives	❒	❒	❒	❒	❒
Others :_____					

Thank you very much for your time!

Oxfam Research Reports

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