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Oilseed Farming in Myanmar: An Analysis of Practice, Productivity, and Profitability

Assessment of the 2023 Monsoon

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ABSTRACT

We have analyzed oilseed production patterns, productivity, and profitability for the 2023 monsoon season from the Myanmar Agriculture Performance Survey (MAPS), conducted at the beginning of 2024. This survey encompassed plots managed by 802 oilseed producers, distributed across all states/regions of the country. Our findings reveal:

1. **Overall, oilseed productivity increased by an average of 2 percent during the 2023 monsoon compared to the previous year**. Performance differed by crop with soybean and sesame experiencing moderate increases in yield, while groundnut and sunflower witnessed a decline in average yields of one percent. This mediocre performance stemmed from low input usage (particularly fertilizer), similar labor inputs, and a high occurrence of natural shocks, notably pests, diseases, and weeds, and heavy rain and storms.
2. **Despite decreasing fertilizer prices, chemical fertilizer use remained low in oilseed production, with 45 percent of farmers using chemical fertilizer in monsoon 2023.** Further, chemical fertilizer use did not increase in oilseed production compared to the previous monsoon.
3. **Organic fertilizer use, on the other hand, is high in oilseed production, as 63 percent of farmers applied it in the 2023 monsoon season.** During this time, organic fertilizer was used by 74 percent of groundnut farmers and 76 percent of oilseed farmers in the Dry Zone. This is due to the availability of organic manure in the Dry Zone where oilseed production is high.
4. **Groundnut, soybean, and sesame farmers relied on seeds saved from last year's harvest, while 67 percent of sunflower farmers purchased seeds from ag-input retailers or the government.** The percentage of oilseed farmers using self-preserved seed – instead of obtaining it from the market - increased by 9 percentage points compared to last monsoon.
5. **Draught animal ownership remains important for oilseed production, especially in the Dry Zone.** Seventy-one percent of oilseed farmers used draught animals in production, with 50 percent using their owned draught animals.
6. **Thirty-nine percent of oilseed farmers reported being impacted by climatic or other production shocks during this monsoon**, with pests, diseases, and weeds (reported by 36 percent of farmers who experienced shocks), heavy rain/ storms (reported by 34 percent), droughts (reported by 22 percent), and irregular rainfall (reported by 21 percent) having significant adverse effects on yields.
7. **Oilseed prices at the farm level increased by between 20 (soybean) and 45 (sunflower) percent**, reflecting changes in international oilseed prices as well as the depreciation of the MMK.
8. **Real – in terms of the cost of an average food basket – gross margins from oilseed farming during the monsoon of 2023 increased by between 2 (soybean and groundnut) and 12 (sesame) percent compared to the previous year.** Real sunflower gross margins declined. At the same time, nominal profits increased by 33 percent since the previous monsoon. High price inflation tempered the increase in real profits.
9. **Twenty percent of oilseed farmers faced significant issues in terms of marketing, including low prices for crops, insecurity, and having trouble reaching traders.** These issues likely decreased the profitability of oilseed farming for the affected farmers.

10. **Oilseed farmers reflecting on this monsoon compared to last, perceived higher profits, suggesting that the oilseed sector continues to be a lucrative choice for farmers.**

These findings have several policy implications:

1. **Ensure access to quality seeds**: Reusing seeds from previous seasons reduces yields, especially when combined with climate shocks. The private sector should make quality seeds and seeds with high oil content available to boost oilseed crop yields.
2. **Promote organic fertilizer use**: Organic fertilizer is predominantly used in the Dry Zone. Expand its use to other agro-ecological zones to improve long-term soil fertility and help farmers mitigate the impact of fluctuating chemical fertilizer prices. The private sector and NGOs through in-person and online platforms can provide training on making compost from farm residues for farmers without access to animal manures.
3. **Enhance pest and disease management**: The private sector should provide farmers with access to better pest and disease management resources, including training and access to effective, environmentally friendly pesticides and herbicides.
4. **Strengthen climate resilience**: The private sector can strengthen climate resilience by developing and disseminating climate-resilient agricultural practices, providing training on drought-tolerant and flood-resistant crop varieties through in-person and online platforms, and offering financial incentives and technological support to farmers.
5. **Create secure marketing channels**: Farmers face low crop prices and safety issues during trade, along with difficulties in reaching traders due to security concerns. Develop secure and stable marketing channels to address these challenges.
6. **Increase loans for oilseed crops**: Given the higher production costs of groundnut, sesame, and soybean compared to sunflower, MADB should increase their loan amounts for these crops to enhance their productivity. The private sector could also lend money to oilseed farmers, given the increase in oilseed production stemming from their perceived profitability and importance to the government.

1. INTRODUCTION

The consumption of edible oils is a critical part of the Myanmar diet, yet Myanmar faces significant production and consumption deficits of edible oils. Despite an annual national requirement of 1.1 million tons of edible oil, domestic vegetable oil extraction barely amounts to 400,000 tons.[1] Consequently, the country relies on imports of around 700,000 tons per year, with palm oil constituting 90 percent of these imports (Moh et al., 2021). On the other hand, oilseeds are also the predominant crop for a large number of farmers in Myanmar, as well as an important focus of the military government's agricultural strategy.

The military government aims to achieve self-sufficiency in oilseed production by increasing edible oil crop yields and expanding oilseed cultivation. This includes expanding sunflower production by planting up to 4 million acres mainly in Sagaing, Mandalay, Magway, Ayeyarwady, and Shan to cover domestic oil consumption[2]. To do so the government plans to plant 2,000 acres of seed production fields in Sagaing. The seeds produced from these farms will be directly distributed to sunflower farmers[3]. During the 2022-2023 fiscal year, the Ministry of Agriculture, Livestock, and Irrigation (MOALI) provided quality sunflower seeds to farmers and 1.08 million acres of sunflowers were planted under the project[4]. In other attempts to encourage self-sufficiency in oilseed production, in 2024 the Department of Agricultural (DOA) has been using their funds to provide sesame seeds to farmers in the Ayeyarwady region. Further, MOALI has announced plans to cultivate oil crops (peanut, sesame, and sunflower) in specific zones during the 2024-2025 financial year to ensure an adequate supply of edible oil.[5]

Despite the military government's involvement in the sector, oilseed farmers continue to struggle with the impact of the political crisis, international commodity price changes, and the lasting effects of the COVID-19 pandemic. The political crisis has caused substantial problems in the banking and finance sector, in international trade, and in the local transport sector, among others. Moreover, the currency of Myanmar, the kyat (MMK), has been rapidly depreciating, leading to high price inflation in the country (MAPSA 2024b).

This paper provides an assessment on farmers' oilseed farming practices and productivity during the monsoon of 2023 based on data from the Myanmar Agriculture Performance Survey (MAPS) that was conducted with 802 oilseed producers, in all states/regions of the country, over the period January – March 2024. Detailed questions were asked to farmers about their background, input use and input prices, farm management practices, oilseed output and output prices, and natural and other shocks during the monsoon of 2023. This Working Paper analyzes these trends for oilseed farmers and then discusses implications of the findings.

The structure of the paper is as follows. In section 2, we present the data collection method and descriptive statistics. In Section 3, we present statistics on input use and farm management practices for oilseed production. Section 4 looks at the prevalence of natural and other shocks. Section 5 explores oilseed productivity, profitability, and marketing. We finish in the last section with conclusions and implications.

[1] https://www.gnlm.com.mm/expand-sown-acreage-of-oil-crops-for-local-oil-sufficiency/

[2] https://english.news.cn/asiapacific/20230323/d341c62c713449e697f9ee9bd806ca92/c.html

[3] https://www.gnlm.com.mm/sunflower-acreage-grows-to-meet-self-sufficiency/

[4] https://english.news.cn/asiapacific/20230323/d341c62c713449e697f9ee9bd806ca92/c.html

[5] https://www.gnlm.com.mm/myanmar-seeks-foreign-investment-in-oil-crop-cultivation-for-self-sufficiency-in-edible-oil/c.html

2. DATA

The Myanmar Agricultural Performance Survey (MAPS) is a sub-sample of almost 13,000 households interviewed by phone during the sixth round of the Myanmar Household Welfare Survey (MHWS) that was fielded at the end of 2023 (MAPSA 2024a). In the MHWS, information was collected, among others, on the background of these households, welfare indicators, and livelihoods. The follow-up MAPS focused on the agricultural activities of those households that were identified as crop farmers in the MHWS. This survey was implemented by phone over the period January 22nd until March 7th, 2024. Almost 5,000 farmers (4,663) could be reached for a follow-up interview.

Of the 4,397 crop farmers in the MAPS who grew a crop during the 2023 monsoon season, 802 farmers (18 percent) cultivated oilseeds in the 2023 monsoon season. The number of oilseed farmers interviewed by type of oilseed and agro-ecological zone[6] is shown in Table 1, while Figure 1 shows the number of oilseed farmers interviewed by township, indicating their spread in the country. MOALI evaluated the oilseed area cultivated during the monsoon of 2023 at 8.6 million acres. This implies that with the MAPS, approximately one oilseed farmer was interviewed, on average, for each 10,753 acres of oilseed cultivated in the country.

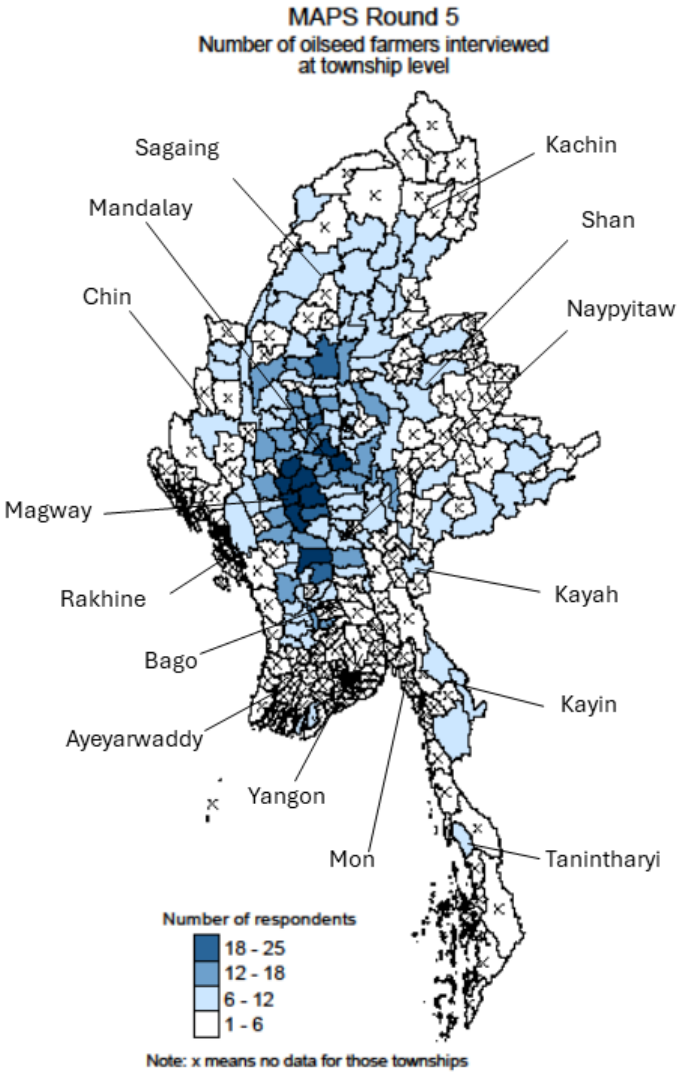
Table 1: Sample of oilseed farmers in Monsoon 2023 and 2023, MAPS

	Monsoon 2022	Monsoon 2023
By Crop		
Oilseeds	833	802
Groundnut	458	469
Soybean	53	56
Sesame	509	432
Sunflower	41	39
By Zone		
Hills and mountains	155	113
Dry Zone	599	596
Delta region	74	90
Coastal Zone	5	3

Source: Authors' calculations based on MAPS, monsoon season 2023.

[6] Delta (Ayeyarwady, Bago, Mon, Yangon); Coastal (Rakhine, Tanintharyi); Central Dry (Mandalay, Magway, Nay Pyi Taw, Sagaing); Hills and Mountains (Chin, Kachin, Kayah, Kayin, Shan).

Figure 1: Sample of oilseed farmers, MAPS monsoon season 2023



Source: Authors' calculations based on MAPS, monsoon season 2023.

To ensure that crop farmers are representative of the crop farming population in their state or region, a weighting factor was calculated building on the method used for the MHWS (Lambrecht et al. 2023). Basic weights are calculated to match the MAPS numbers to this crop farming population of the 2017 Myanmar Living Conditions Survey (MLCS). The basic weights further correct for education bias in the sample (based on MLCS numbers) and make sure that we match overall population numbers of the 2019 Inter-Censal Survey (at urban/rural and State and Regional level). An entropy correction approach was then implemented to additionally correct for large farm bias (using 5 land sizes) as well as adjust the share of women-adult-households in the farm population to the MLCS number.

The MAPS collected information on household characteristics, overall area cultivated, crops grown, oilseed production and sales, agricultural input and output prices, and the incidences of natural and other shocks. In this paper, we focus in particular on the information that was collected on the biggest oilseed plot of oilseed producers in the monsoon seasons of 2022 and 2023. Data for these plots were collected on input use and farm management practices, such as the use of seeds, agro-chemicals, fertilizers, labor and mechanization, and oilseed output. Farmers were also asked to estimate overall monetary input expenditures on these plots. While we collected these data from 718 oilseed farming households out of the 802 households that cultivated oilseeds in Monsoon 2023,

caution is warranted in interpretation and extrapolation to national and state/region-wide oilseed production as we only collected this information on the largest oilseed plot.

We divide the country into four major agro-ecological zones that are commonly used in Myanmar and present our results at that level. The average farm size of the interviewed oilseed farmers was 4.0 acres (Table 2). The biggest oilseed farms are seen in the Delta Region and Dry Zone (4.4 acres) while farms in the Hills and Mountains are substantially smaller (2.1 acres). There is almost no oilseed production in the coastal region in our sample, though according to MOALI, some groundnut and sesame farms are present there. Most oilseed production in the Coastal Zone, however, is during the post/pre monsoon season. Nationally, the size of the largest oilseed plot was on average 2.2 acres while the median was 1.5 acre. A large majority of oilseeds plots at the national level are on flat land (87 percent), though 28 percent and 26 percent of oilseed production in the Delta and the Hills and Mountains Zone are in the uplands (gentle or steep slope).

The main farm management decision maker for these oilseed farms was male in 81 percent of the cases and 49 years old on average. Two percent of these agricultural decision makers had no education at all while 94 percent indicated that they had completed standard levels from 1 to 10. The number of household members working on the farm was on average 2.3. A similar number of adult males and females work on oilseed farms.

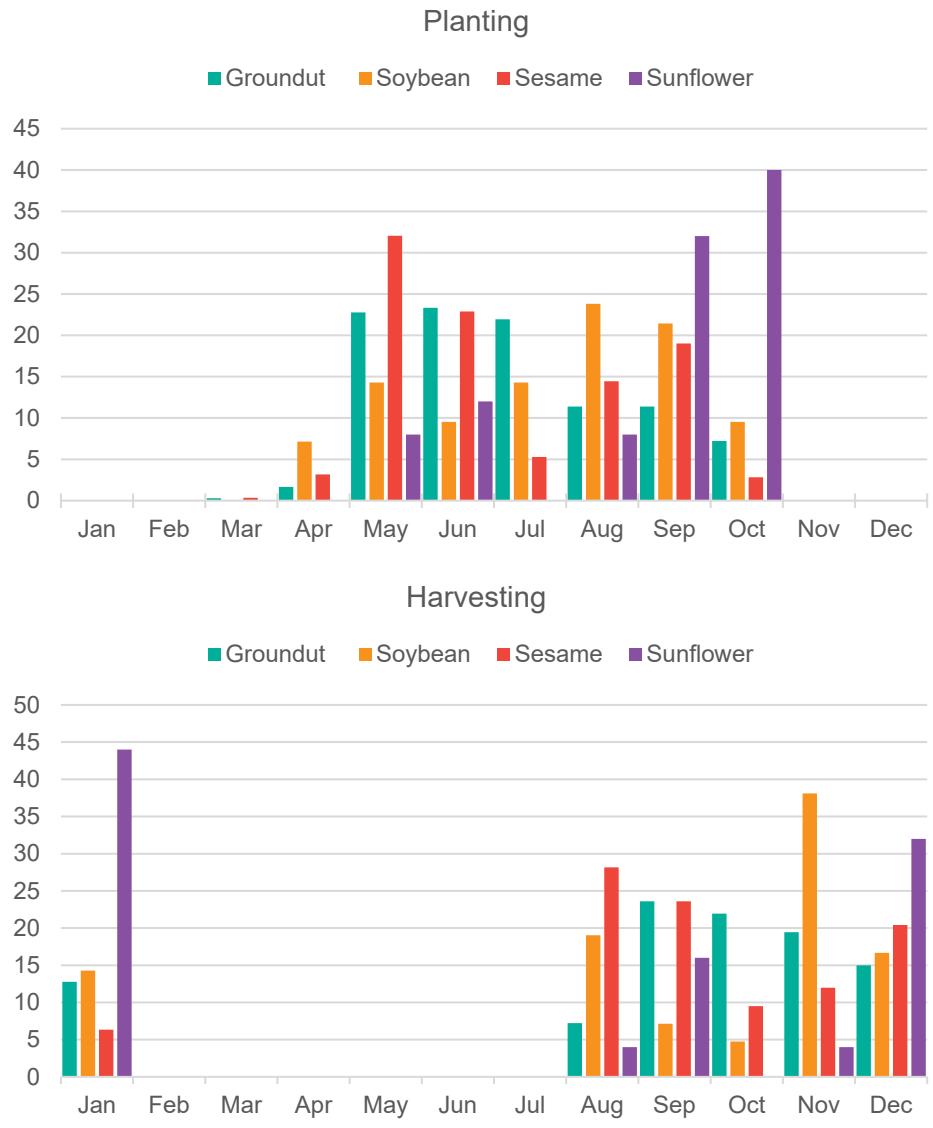
Table 2: Descriptive statistics of oilseed farmers, MAPS

		Monsoon 2023				
	Unit	National	Hills	Dry	Delta	Coastal
Total number of oilseed farmers	Number	802.0	113.0	596.0	90.0	3.0
Background of oilseed farm						
Average size of oilseed farm - mean	Acres	4.0	2.1	4.4	4.4	1.2
Size largest plot - mean	Acres	2.2	1.7	2.4	2.2	1.1
Size largest plot - median	Acres	1.5	1.0	2.0	1.0	1.0
Slope - largest plot						
1. Steep slope	%	1.4	3.9	0.5	3.6	0.0
2. Gentle slope	%	12.2	21.7	6.1	24.1	81.3
3. Flat	%	86.4	74.4	93.4	72.3	18.7
Background of main farm management decision maker of oilseed farms						
Age	Years	49	46	49	51	55
Gender	% male	81.2	71.5	82.3	85.7	100.0
Highest level of education achieved						
None	%	1.8	5.6	1.2	0.0	0.0
Standard 1-10	%	94.3	91.2	94.1	99.2	100.0
Bachelor	%	3.1	2.8	3.7	0.8	0.0
Other	%	0.8	0.4	1.0	0.0	0.0
Household members working regularly on the oilseed farm						
Adult male - mean	Number	1.2	1.2	1.2	1.1	1.2
Adult female - mean	Number	1.1	1.2	1.1	0.8	1.0
Children - mean	Number	0.0	0.0	0.0	0.0	0.0

Source: Authors' calculations based on MAPS, monsoon season 2023.

In Myanmar, oilseeds are planted in the monsoon season and in the post/pre monsoon season. The cycle duration for most oilseeds is around 4 months. We asked farmers to indicate what they considered their main planting and harvest month for oilseeds on their most important oilseed plot during the 2023 monsoon season (Figure 2). For groundnut, planting was done across May (23 percent of farmers), June (23 percent of farmers), and July (22 percent). The main harvest months for groundnuts were September (24 percent), October (22 percent), and November (19 percent). Soybeans are planted slightly later than groundnuts, with most farmers planting them in August (24 percent) or September (21 percent). Most soybean harvesting occurs in November (38 percent). Sesame is mainly planted in May (32 percent) and June (22 percent) in the Dry Zone and Delta Region, whereas in the Hills it is planted in August and September. Sunflowers are mainly planted in September (32 percent) and October (40 percent) and harvested in December (32 percent) and January (44 percent). It seems, therefore, that at the time of the survey, most of the monsoon oilseed crop was harvested for most states and regions in the country. Moreover, the time between harvest and the survey was not too long, reducing recall error.

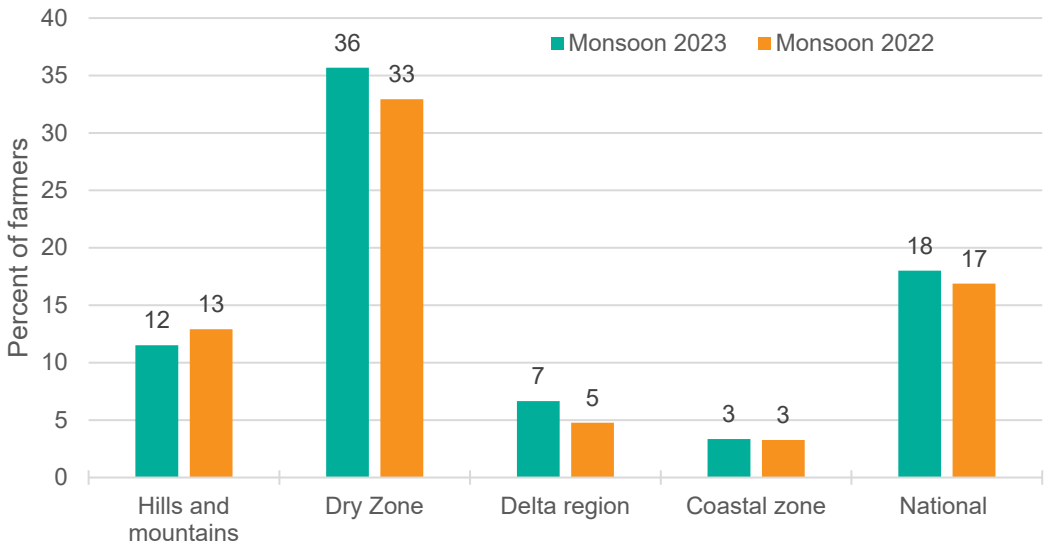
Figure 2: Main planting and harvest month of monsoon oilseeds 2023



Source: Authors' calculations based on MAPS, monsoon season 2023.

Nationally, 18 percent of farmers in the MAPS sample were engaged in oilseed cultivation in the 2023 monsoon season, similar to the 2022 sample. Figure 3 illustrates the change in the share of farmers growing oilseeds as one of their most important crops (among non-paddy crops) by agro-ecological zones (AEZ) between monsoon 2022 and monsoon 2023. Among the agro-ecological zones, the Dry Zone (Magway, Mandalay, Sagaing and Nay Pyi Taw) had the largest share of farmers growing oilseeds as their most important non-paddy crop; 36 percent of crop farmers interviews in the Dry Zone planted oilseeds in monsoon 2023. The Hills and Mountains was the second most important Zone for oilseed production, with 12 percent of farmers in that Zone growing oilseeds as an important non-paddy crop in the 2023 monsoon season. The Delta Region had very few oilseed producers in the sample, around 7 percent of farmers. Further, oilseed production in the Delta Region is even smaller in the winter season, making the Delta Region not a major location of oilseed production. Finally, the Coastal Zone had very few oilseed farmers, as most oilseed production in the Coastal Zone occurs in the post/pre-monsoon season.

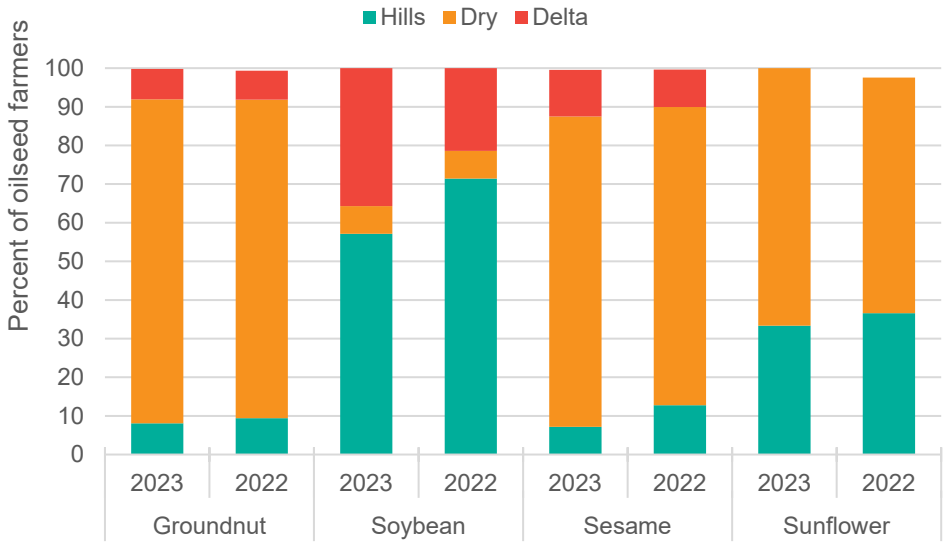
Figure 3: Share of farmers who grow oilseeds as their most important non-paddy crop by agro-ecological zone



Source: Authors' calculations based on MAPS, monsoon season 2023 and 2022.

The share of farmers growing different oilseed crops by agro-ecological zones in 2023 is shown in Figure 4. The share of farmers in 2023 was similar to 2022, though more soybeans were produced in the Delta in 2023 compared to the previous year. Groundnut, sesame, and sunflower were mainly grown in the Dry Zone, the country's "oil bowl", while soybean was mainly grown in the Hills and Mountainous Region.

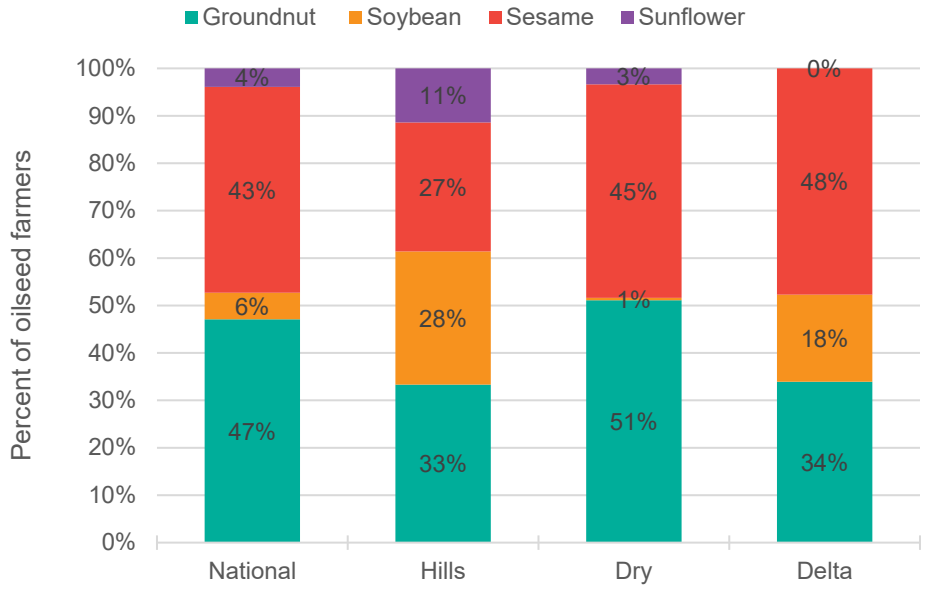
Figure 4. Share of oilseed crop cultivated by agro-ecological zones, monsoon 2023 and 2022



Source: Authors' calculations based on MAPS, monsoon season 2023 and monsoon season 2022.

In the monsoon season of 2023, groundnuts accounted for 47 percent of the oilseeds planted, followed by sesame, 43 percent, soybean, 6 percent, and sunflower, 4 percent (Figure 5). Sunflowers and soybeans are mainly planted in the winter season, not during the monsoon. Sunflowers are grown using the residual moisture from rice production. Oilseed cultivation varies depending on geographical location. In the Dry Zone, where most oilseed production occurs, 51 percent of oilseed farmers planted groundnuts, while 45 percent of oilseed farmers planted sesame. In the Hills and Delta, oilseed production is more varied, with a sizeable percentage of farmers planting soybeans in both Zones, and 11 percent of farmers planting sunflowers in the Hills.

Figure 5: Share of farmers who grow different types of oilseeds as their most important non-paddy crop by agro-ecological zone



Source: Authors' calculations based on MAPS, monsoon season 2023.

3. INPUT USE AND FARM MANAGEMENT PRACTICES

In this section, we look at input and farm management practices used in oilseed cultivation, including seeds, agro-chemical and fertilizer use, and labor and mechanization as well as overall commercial input expenditures, and access to credit and agricultural extension services. Oilseed farmers in Myanmar predominantly rely on their own saved oilseed seeds from their previous harvest (Table 3). For the monsoon of 2023, 74 percent of the seed planted were own saved seeds, 10 percent of the oilseed farmers indicated that they bought seeds from agri-input suppliers or the government, while 14 percent bought seeds from other farmers.

There were large differences in how farmers obtained seeds depending on the oilseed crop grown. Very few soybean or groundnut farmers purchased their seeds from an agri-input retailer or the government, 4 percent, and 7 percent, respectively. There was a decline in the percentage of farmers buying their seeds from this source compared to the previous monsoon season, by 5 and 15 percentage points, respectively. The quality of reused seeds typically worsens the longer they are used by farmers, suggesting that this lower reliance on the market likely leads to lower oilseed yields (Spielman and Kennedy 2016). On the other hand, a majority of sunflower farmers purchased their seeds from agri-input retailers or the government, 69 percent. Purchased seeds are usually improved seeds and may lead to higher yields. In the case of sunflowers, MOALI provides quality sunflower seeds to farmers under the government project. While farmers across Myanmar appear to be uninterested in growing sunflowers, those located within the project area plant sunflowers using the MOALI seeds.

Table 3: Seed use in oilseed production, monsoon 2023

	Unit	Oilseeds	Groundnut	Soybean	Sesame	Sunflower
Seed source						
Purchased from agri-input retailer or government	%	10	7	4	10	69
Purchased from other farmer	%	14	11	27	18	2
Left over (unused) purchased seed from last year	%	1	1	2	1	0
Saved (harvested) from last year	%	74	82	68	69	29
Other	%	0	0	0	1	0
Total	%	100	100	100	100	100

Source: Authors' calculations based on MAPS, monsoon season 2023.

Table 4 gives an overview of fertilizer and other agro-chemical use on the largest oilseed plot in the monsoon of 2023. We see relatively low shares of oilseed farmers that use chemical fertilizers and other agro-chemicals, with 45 percent of the farmers using any chemical fertilizer during the 2023 monsoon. This is much lower than the 90 percent of rice farmers who used fertilizer. Fertilizer use was highest among groundnut farmers, with 53 percent applying fertilizers in the monsoon 2023 season, followed by sesame farmers and sunflower farmers. Very few soybean farmers used fertilizer on their largest plot in monsoon 2023, but again we have a small sample size of 42 farmers.

Urea and compound-15-15-15 were both applied by about 19 percent of oilseed farmers. Compound-15-15-15 was the most widely used fertilizer by groundnut farmers, with 24 percent of groundnut farmers applying. Urea was the most important chemical fertilizer used by sesame farmers, with 28 percent applying urea in monsoon 2023. A small share of groundnut and sesame farmers also applied other compound fertilizers and T-super. Organic fertilizers were used by 63 percent of oilseed farmers, and lime/gypsum by 19 percent of oilseed farmers. Unlike chemical fertilizer, herbicides and pesticides were widely applied across oilseed crops with 18 percent of

oilseed farmers applying glyphosate, 33 percent of oilseed farmers applying other herbicides and 50 percent of oilseed farmers applying pesticides.

We further note that chemical fertilizer use is similar across agro-ecological zones. In the Dry Zone, 43 percent of farmers were using chemical fertilizer compared to 38 percent in the Hills. Organic fertilizer use is significantly higher in the Dry Zone (76 percent of oilseed farmers used it on their oilseed plot), likely linked to the higher prevalence of livestock ownership in that area.

Table 4: Agro-chemicals and fertilizer use in oilseed cultivation, monsoon 2023

	Unit	Oilseeds	Groundnut	Soybean	Sesame	Sunflower
Chemical fertilizer						
Any chemical fertilizer	%	44.8	52.5	18.4	41.4	31.3
Urea	%	19.6	13.8	14.9	27.7	22.5
Compound 15-15-15	%	18.8	24.0	7.1	14.2	23.3
Other compound combined	%	7.2	9.3	0.0	6.4	0.0
T-super	%	2.0	2.8	0.0	1.5	0.0
Other fertilizer and agro-chemicals						
Organic fertilizer	%	63.4	74.0	10.3	57.1	70.2
Lime - gypsum	%	18.6	30.2	1.6	7.8	11.3
Glyphosate	%	18.3	18.1	31.4	18.4	7.2
Herbicides	%	33.4	45.9	45.0	19.5	11.0
Pesticides	%	49.9	56.8	73.8	42.8	18.7

Source: Authors' calculations based on MAPS, monsoon season 2023.

During the monsoon of 2023, oilseed farmers used 15 kgs of fertilizer per acre on average, less than a quarter of the amount used by paddy farmers (Table 5). In the Dry Zone, although slightly more oilseed farmers applied fertilizer compared to farmers in the Hills, the quantity of fertilizer applied was less than in the Hills. This was because farmers who applied fertilizer in the Dry Zone used less chemical fertilizer, on average, than farmers who applied fertilizer in the Hills. It appears that farmers in the Dry Zone are increasingly using organic fertilizer to supplement chemical fertilizer.

Table 5: Chemical fertilizer use in oilseed cultivation (mean kgs per acre), monsoon 2023

	Unit	National	Hills	Dry	Delta
Urea - kg	All farmers	5.8	6.2	5.3	8.9
	Fertilizer users only	29.3	34.7	27.7	30.6
Other fertilizer - kg (compound 15-15-15)	All farmers	6.1	6.8	6.1	5.6
	Fertilizer users only	32.3	53.3	28.3	41.6
Other fertilizer - kg (other compound combined)	All farmers	2.3	2.4	2.7	0.2
	Fertilizer users only	32.8	34.9	32.5	25.0
Other fertilizer - kg (T_super)	All farmers	0.6	0.4	0.7	0.6
	Fertilizer users only	30.6	83.3	28.9	25.0
Total fertilizer - kg	All farmers	14.8	15.8	14.8	15.4
	Fertilizer users only	35.7	47.8	33.5	35.3

Source: Authors' calculations based on MAPS, monsoon season 2023.

The MAPS also captures the extent to which oilseed farmers relied on hired labor, draught animals, and mechanization during the monsoon of 2023 (Table 6). During the monsoon of 2023, 25 percent of the oilseed farmers relied exclusively on their own family labor while 75 percent used outside help. On top of their own household labor, 66 percent of oilseed farmers used solely hired labor and 9 percent used exchange labor. Substantial differences are noted over agro-ecological zones with 86 percent of oilseed farmers in the Delta Zone relying on outside help, compared to 75 percent in the Dry Zone, and 64 percent in the Hills. The Hills has significantly lower hired labor use, 50 percent of oilseed farmers in the Hills used hired labor, and significantly higher exchange labor use, 14 percent. By crop outside labor use was similar in soybean, sunflower, and sesame production, but significantly lower in groundnut production, with only 61 percent of groundnut farmers hiring labor and 10 percent exchanging it.

Overall, oilseed farmers in Myanmar rely heavily on animal use for oilseed production. Draught animals were used by 71 percent of oilseed farmers in the 2023 monsoon season. Draught animal use, however, was mainly in the Dry Zone, where 84 percent of oilseed farmers used draught animals, and 60 percent of oilseed farmers used their own draught animals. In the Delta 53 percent of farmers used draught animals, while in the Hills, only 28 percent, with only 16 percent using their own animals. By crop, animal use was highest among groundnut farmers, 80 percent, and sesame farmers, 68 percent.

While tractor use was lower than draught animal use among oilseed farmers, oilseed farmers still rely heavily on mechanization for their oilseed farm activities. Nationally, 64 percent of farmers used a tractor for plowing plots, lower than the number of tractors used in rice farming. Tractors are the most widely used in the Delta and in soybean and sunflower production. Most tractors are rented, 52 percent, versus 14 percent that are owned.

Table 6. Labor use, animal use, and mechanization in oilseed cultivation by agro-ecological zone and crop, monsoon 2023

	Overall	Hills	Dry	Delta
Labor				
Hired labor	66	50	67	84
Exchange labor	9	14	9	2
Any labor	75	64	75	86
Draught animal				
Hired	20	12	24	16
Own	50	16	60	37
Any animal	71	28	84	53
Tractor for land preparation				
Hired	52	43	55	53
Own	14	29	10	20
Any tractor	64	66	64	73
	Groundnut	**Soybean**	**Sesame**	**Sunflower**
Labor				
Hired labor	61	71	71	73
Exchange labor	10	12	7	9
Any labor	71	84	78	82
Draught animal				
Hired	23	5	20	17
Own	57	19	48	28

Any animal	80	24	68	45
Tractor for land preparation				
Hired	51	35	56	51
Own	11	38	13	26
Any tractor	61	73	66	72

Source: Authors' calculations based on MAPS, monsoon season 2023.

Table 7 shows how input use and adoption practices of major agricultural technologies in oilseed cultivation have changed over the last three monsoons. First, oilseed farmers have increased their reliance on their own saved seeds, even with the MOALI seed distribution of sunflower and sesame seeds. This is concerning, given that lower yields are often associated with reused seeds. Second, despite lower fertilizer prices at the end of 2023, overall fertilizer use has barely increased among oilseed farmers. Third, the use of draught animals in oilseed production has remained high over the three monsoon periods. Fourth, the use of tractors for plowing has increased over the three monsoon periods, mainly due to an increase in oilseed farmers renting tractors.

Table 7: Changes in input use and management practices in oilseed cultivation on the largest oilseed plot, monsoon 2021 to 2023

	Unit	2021	2022	2023
Saved (harvested) seed from last year	%	69	65	74
Chemical fertilizer use				
All farmers	kgs/acre	13	14	15
Animal for plowing				
Any	%	72	69	71
Own	%	49	45	50
Tractor for land preparation				
Any	%	52	54	64
Own	%	12	11	14

Source: Authors' calculations based on MAPS, monsoon season 2023, 2022, 2021.

In Table 8 we assess overall (commercial) input expenditures on the largest oilseed plot. Commercial input expenditures might give a good indication of the intensity of input use in oilseed production.[7] Input expenditures per acre increased on average by 6 percent, and by 19 percent using the median, during the 2023 monsoon compared to the previous one. With the increased perceived profitability in oilseed farming, given rising oilseed prices compared to the previous year, it seems that farmers increased expenditures on their oilseed plots and (partially) compensate for the increased prices of mechanization and labor. The highest input expenditures per acre were noted among groundnut and soybean farmers (Table 8). Sunflower farmers had significantly lower median input expenditure because of provision of seeds, and fertilizer distribution at subsidized price by the government.

[7] There are likely a number of issues with the measurement of input expenditures in MAPS. First, we only rely on monetary input expenditures. This is an imperfect way of assessing inputs into oilseed production as there are a number of non-monetary inputs going into oilseed production as well, such as family labor, organic fertilizer, and animal traction. Second, monetary input expenditures were approximated by farmers asking for a simple measure of what they spent on their largest oilseed plot. This might have been complicated to answer for farmers given that a number of inputs are bought in bulk and getting at the exact costs for a plot might therefore have been wrongly evaluated. Coming with a single number at once – combining all costs of fertilizer, agro-chemicals, mechanization, and hired labor – might also have been problematic. It is therefore likely that there is measurement error in this variable and a caveat for further analysis.

Table 8: Monetary input expenditures (MMK/acre) on oilseeds

	Monsoon 2022	Monsoon 2023				
	Oilseeds	Oilseeds	Groundnut	Soybean	Sesame	Sunflower
Mean	176,034	186,009	212,734	198,115	157,307	147,373
Median	140,000	166,667	200,000	200,000	140,000	100,000

Source: Authors' calculations based on MAPS, monsoon season 2023 (round 5) and monsoon season 2022 (round 3).

Agricultural credit is important to be able to afford these productivity enhancing inputs. Farmers can potentially obtain credit from multiple sources. The sources of credits consist of the formal financial institutions (MADB, Department of Cooperatives, microfinance institutions (MFIs) and non-government organizations (NGOs), private banks), revolving funds (Mya Sein Yaung), and the informal credit sector (agricultural input suppliers, agricultural machinery suppliers, agricultural traders, rice or oil mill owners, friends and relatives, and private money lenders).

In Table 9, we explore access to credit among oilseed farmers who do not also cultivate rice. Because we ask each farmer if they have credit rather than asking credit by crop, by focusing only on oilseed farmers who did not cultivate rice, we can try to tease out lending patterns among oilseed farmers alone. Nationally, 46 percent of oilseed farmers took loans from the MADB (Table 9). MADB lends 150,000 MMK per acre for paddy and sunflower extension[8] and 100,000 MMK per acre for the other crops up to a maximum of 10 acres at an interest rate of 5 percent. The MADB, however, does not extend loans to farmers who did not repay their last loans in full. Hence, it is likely that some farmers did not have access to new MADB loans.

Loans from relatives and friends were the second most frequent source of credit at 15 percent in the monsoon of 2023. This was followed by loans from private money lenders. The share of oilseed farmers without rice borrowing from agricultural input suppliers was 9 percent and declined significantly from the post/pre-monsoon season. On the other hand, the share of oilseed farmers borrowing from traders increased, but to 6 percent. Finally, only 6 percent of oilseed farmers with no rice took out loans from microfinance institutes (MFIs) or NGOs, a significant decline from the previous monsoon season.

Table 9: Main sources of agricultural loans for oilseed farmers, monsoon 2023

		Monsoon 2023		Monsoon 2022	
	Unit	All crops growing households	Oilseeds growing households	Oilseeds growing households with no rice	
Credit from any source	%	43.2	40.6	38.3	40.0
MADB – (Covid19 funds and other)	%	56.1	57.1	46.3	46.3
Relatives/Friend	%	15.2	12.6	14.5	17.6
Private money lender	%	8.0	8.1	9.7	12.6
Agricultural input suppliers	%	10.9	9.3	8.6	5.7
Revolving fund (Mya Sein Yaung)	%	6.2	5.0	7.5	10.8
Microfinance Institution/ NGO	%	5.3	5.1	5.6	23.9
Agricultural trader (crops or crops + inputs)	%	4.1	3.7	5.7	3.3
Private bank	%	1.2	2.2	2.6	0.7
Department of Cooperatives	%	1.0	1.2	2.2	2.8
Other	%	5.1	8.9	11.6	1.4

Source: Authors' calculations based on MAPS, monsoon season 2023.

[8] https://www.madb.gov.mm/en/services-en/

Extension services can be accessed by farm households from different sources such as public extension agents (DOA, including a call center in MOALI), private sector agents, NGOs, and cellphone applications or the internet. Table 10 shows the shares of different sources of extension services for different types of farm households: all crops growing households, oilseed growing households, and oilseed growing households with no rice crop.

The percentage of oilseed farmers using each type of extension was similar to that of all crop growing households, and oilseed farming households without rice. Among the different sources of extension, private sector agents including agents from input companies, traders, and ag-input suppliers, were the most common extension providers. Around 20 percent of oilseed growing households with or 19 percent without rice received extension services from private sector agents in the monsoon 2023 season, respectively. Cellphone applications or the internet were the second most common extension provider in the monsoon 2023 season, with 18 percent of households relying on this method. Public extension was the third most common service provider. Around 14 percent of oilseed farmers with no rice received public extension. The number of oilseed farming households receiving extension from any source was similar between the 2023 and 2022 monsoon seasons. At the same time, extension from NGOs fell significantly.

Table 10: Main sources of extension services for oilseed farmers, monsoon 2023

		Monsoon 2023			Monsoon 2022
	Unit	All crops growing households	Oilseeds growing households	Oilseeds growing house-holds with no rice	
Extension from any source	%	37.4	38.4	37.6	36.5
Private sector agents	%	20.6	20.3	19.2	21.1
Cellphone applications and internet	%	17.7	17.6	18.3	18.5
Public extension agents	%	13.9	14.6	13.6	13.2
NGOs	%	8.1	7.2	7.1	14.3

Source: Authors' calculations based on MAPS, monsoon season 2023. Private sector agents include input companies, traders, agri-input suppliers, and crop traders. Cellphone applications and internet include facebook, Htwet Toe, Greenway, and Golden Paddy. Public extension agents include the DOA in person or call centers, or MOALI.

4. NATURAL AND OTHER SHOCKS

Climatic shocks are important risks in agricultural production and especially widespread in Myanmar.[9] When asked about the incidence of natural or other production shocks 39 percent of oilseed farmers compared to 30 percent of rice farmers indicated that they were negatively impacted by at least one of these shocks in the monsoon 2023 season.

Of those impacted by natural shocks, 34 percent of oilseed farmers reported that their production was negatively impacted by heavy rain or storms (Table 11). This was an issue across all regions, with 34 and 33 percent of oilseed farmers in the Delta Region and Dry Zone affected. Irregular rain was also a significant issue in the Delta Region and Dry Zone negatively affecting 25 and 24 percent of oilseed farmers, respectively. Draught negatively impacted 22 percent of farmers, mainly in the Dry Zone. Flooding affected 10 percent of farmers, and 17 percent in the Hills Region. Pest and diseases were a significant issue for oilseed farmers. Thirty-six percent of oilseed farmers experiencing shocks were negatively affected by pests and diseases with as many as 47 and 45 percent of oilseed farmers experiencing shocks affected in the Delta and Hills.

[9] It is expected that such climatic shocks will increase in the future. Myanmar is seen as one of the countries most affected by climate change globally (IFRC 2022).

Table 11: Natural and other production shocks faced by oilseed farmers

	Unit	National	Hills	Dry	Delta
Crop negatively affected by any shock	%	39.3	30.7	39.4	42.5
If yes, which one?					
Drought	%	22.0	4.6	27.7	14.0
Poor access to irrigation water	%	2.3	4.1	2.5	0.0
Irregular rain	%	20.9	8.2	23.7	25.3
Extreme temperature	%	0.0	0.0	0.0	0.0
Pest, diseases, weeds	%	36.2	44.7	29.5	46.6
Damage by animals	%	6.1	12.5	4.0	13.2
Flood	%	9.6	17.4	9.9	2.9
Rain/storm	%	34.3	25.5	33.2	34.4
Others	%	0.9	0.0	1.2	0.0

Source: Authors' calculations based on MAPS, monsoon season 2023.

5. OILSEED PRODUCTIVITY, PROFITABILITY, AND MARKETING

National yields – based on reported yields of the largest plot – averaged 311 kgs per acre or 285 at the median for the monsoon of 2023 (Table 12). Compared to the monsoon of 2022, we note an increase in yields of 2 percent on average, and a decline compared to 2021. At the median though we see an increase of 25 percent compared to both previous years. Soybean yields witnessed the highest mean and median increases compared to the previous year, followed by sesame. Groundnut and sunflower witnessed a decline in average yields of one percent between the 2023 and 2022 monsoon season.

Table 12: Oilseed yields on the largest plot (kgs/acre), monsoon 2020 to 2023

	2021		2022		2023	
	Mean	Median	Mean	Median	Mean	Median
Oilseeds	320	228	306	228	311	285
Groundnut	426	342	418	365	413	399
Soybean	485	491	549	491	601	572
Sesame	164	139	156	123	163	132
Sunflower	288	164	142	145	141	145
Hills	408	228	361	228	326	285
Dry	301	228	292	228	303	285
Delta	301	228	292	228	379	285

Source: Authors' calculations based on MAPS, monsoon season 2023 (round 5), monsoon 2022 (round 3), and monsoon season 2021 and 2020 (round 1).

While yields remained mainly stagnated, prices increased considerably. Over two years the nominal price of groundnut and sunflower increased by more than 150 percent (Table 13). The majority of the price increase occurred between 2021 and 2022, but prices continued to rise between 2022 and 2023. The nominal farmgate sesame prices increased by 70 percent over the two-year period, and 28 percent between monsoon 2022 and monsoon 2023. Nominal soybean prices increased by the lowest percent, 50 percent over the two years and 20 percent after monsoon 2022.

Table 13: Oilseed farmgate median prices (nominal per kg), monsoon 2021 to 2023

	Monsoon 2021	Monsoon 2022	Monsoon 2023	1 year change (%)	2 year change (%)
Groundnut	1,053	1,930	2,632	36	150
Soybean	1,223	1,529	1,835	20	50
Sesame	2,449	3,265	4,172	28	70
Sunflower	1,227	2,147	3,103	45	153

Source: Authors' calculations based on MAPS, monsoon season 2023 (round 5), monsoon 2022 (round 3), and monsoon season 2021 and 2020 (round 1).

Despite the relatively smaller increase in soybean prices compared to the other oilseeds, but because of relatively higher yields and lower estimated input expenditures, soybeans had the highest gross margins of the planted oilseed crops in Myanmar in the 2023 monsoon season (Figure 6). This was followed by groundnuts, which had the second highest yields and have had high increases in prices. In the monsoon season, sesame and sunflower had much smaller gross margins, around 460 MMK per acre and 320 MMK per acre, respectively. Despite the government investment, sunflowers still have much lower gross margins than other oilseed crops, rice, and most pulses.

Figure 6: Gross nominal inputs, profits and revenues by oilseed crops

Source: Authors' calculations based on MAPS, monsoon season 2023.

We also assess how gross profits have changed over the last three monsoons, combining data from average yields, oilseed prices, and commercial expenditures per acre over these periods. We see a significant improvement for (nominal) gross revenues per acre between monsoon 2021 and 2023: they increased by 162 percent over the two year period, whereas they increased by 33 percent between monsoon 2022 and 2023 (Table 14). Over the one year period, nominal sesame gross margins increased by the largest margin. While profits increased in nominal terms, price inflation has been high in the country (MAPSA 2024b) and real profit increased by much less. Real – in terms of the costs of an average food basket (MAPSA 2024b) – profits from oilseed farming during the

monsoon of 2023 decreased by 1 percent on average compared to the monsoon of 2022 and increased by 17 percent compared to the monsoon of 2021.

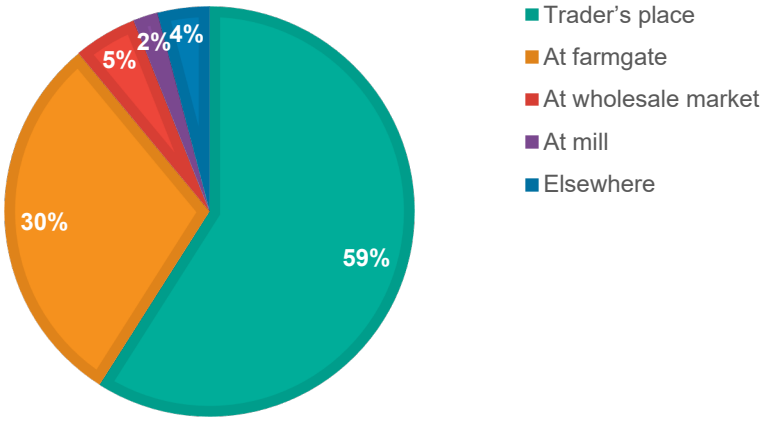
Table 14: Gross median nominal revenue and real - in terms of the cost of an average food basket - profits per acre in oilseed production, monsoon 2020, 2021, 2022, and 2023

	Monsoon 2021	Monsoon 2022	Monsoon 2023	1 year change (%)	2 year change (%)
Nominal					
Groundnut	255,000	583,333	800,000	37	214
Soybean	383,333	645,000	880,000	36	130
Sesame	166,667	305,000	460,000	51	176
Sunflower	141,871	300,000	320,000	7	126
Real					
Groundnut	545,700	752,500	768,000	2	41
Soybean	820,333	832,050	844,800	2	3
Sesame	356,667	393,450	441,600	12	24
Sunflower	303,604	387,000	307,200	-21	1

Source: Authors' calculations based on MAPS, monsoon season 2023 (round 5), monsoon 2022 (round 3), and monsoon season 2021 and 2020 (round 1).

Oilseed farmers were asked where they mainly sold their crops. In the monsoon 2023 season, the majority of oilseeds were brought to the location of the trader and sold there (59 percent) (Figure 7). Thirty percent of farmers sold their oilseeds on their own farm. Eleven percent of oilseed farmers sold their oilseeds at other locations including at the wholesale market (5 percent) and infrequently at the mill (2 percent).

Figure 7: Location of oilseed sales, monsoon 2023



Source: Authors' calculations based on MAPS, monsoon season 2023.

Table 15 presents the challenges faced by oilseed farmers in the monsoon 2023 season. The first column includes any challenge faced by an oilseed farmer, while the second column only includes the largest challenge for those who reported facing a challenge. Most of the oilseed farmers did not have any challenge in selling their crops (80 percent). Among the challenges encountered,

low prices for crops was both the most widely faced challenge for oilseed farmers (4 percent of farmers faced this challenge overall) and the most important challenge (32 percent of farmers who faced a challenge reported this as the largest disruption). While high prices of fuel was a challenge faced by 4 percent of oilseed farmers, for most, it was not the most disruptive challenge. Four percent of oilseed farmers had trouble reaching buyers or traders, either because the traders could not reach the farm, or because the farmer could not reach the trader. However, this was the largest disruption for 22 percent of oilseed farmers. Finally, 27 percent of oilseed farmers stated that their principal disruption was insecurity during travel to sell their oilseeds.

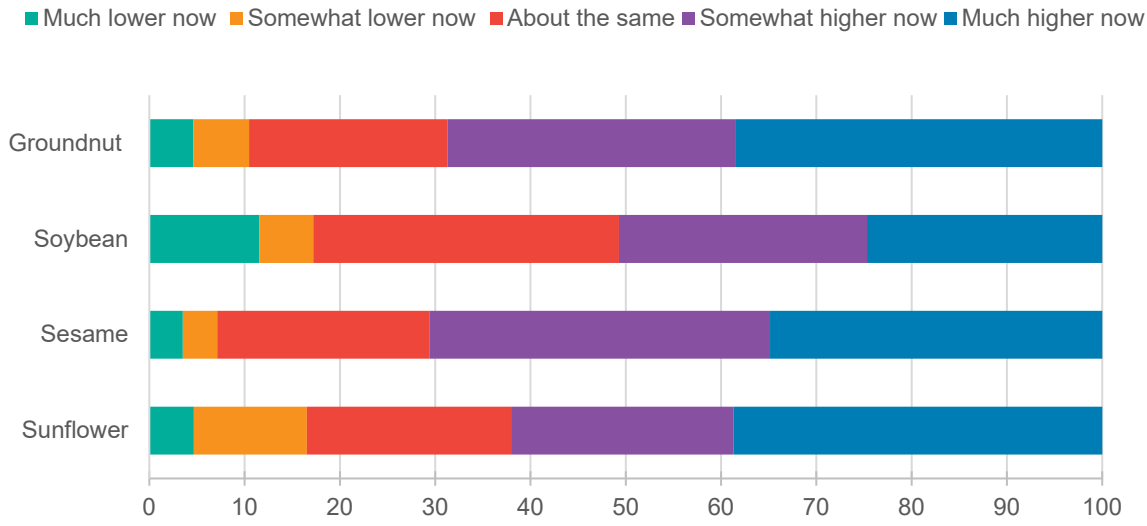
Table 15: Challenges faced by oilseed farmers, including any challenge and the largest disruption

	Faced challenge (%)	Largest disruption (%)
No challenge	80.1	
Low prices for crops	4.0	31.7
High price of fuel / high transportation cost	3.6	8.0
Buyers or traders cannot reach the farm, or I cannot reach them	3.5	22.4
Insecurity during travel	2.8	27.4
Not many traders	2.1	5.1
Markets are closed	1.6	1.4
Payment problems	1.0	0.9
Have to sell crops on credit	2.8	1.2
9999 = other	1.1	2

Source: Authors' calculations based on MAPS, monsoon season 2023.

Despite challenges, due to rising nominal farmgate prices, and lower fertilizer prices, most farmers felt that their production in monsoon 2023 was more profitable (Figure 8). Farmers were asked how does the overall sales income from your crop farming compare to this time last year (total income of monsoon of 2023 compared to income of monsoon of 2022). Thirty-five percent of oilseed farmers reported much higher profits, more than 20 percent higher in monsoon 2023 than in monsoon 2023. Another 33 percent of oilseed farmers reported somewhat higher profits, while 22 percent reported no change. Eleven percent of oilseed farmers reported a reduction in earnings compared to monsoon 2022. Seventy-one and 69 percent of sesame and groundnut farmers thought that they were more profitable now than a year ago, respectively.

Figure 8: Perception of oilseed profitability



Source: Authors' calculations based on MAPS, monsoon season 2023.

6. CONCLUSIONS AND IMPLICATIONS

We have analyzed oilseed productivity and profitability data for the 2023 monsoon season from the Myanmar Agriculture Performance Survey (MAPS), conducted at the beginning of 2024. This survey encompassed plots managed by 802 oilseed producers, in the Dry, Hills, and Delta regions. Nationally, nearly 18 percent of crop farmers were engaged in oilseed cultivation during the 2023 monsoon season. Among them, most farmers planted groundnut and sesame.

Oilseed farmers used their recycled seeds from the previous season except for sunflower farmers who purchased their seeds. The percentage of oilseed farmers using self-preserved seed – instead of obtaining it from the market - increased by 9 percentage points compared to last monsoon. Draught ownership remains important for oilseed production, especially in the Dry Zone. Seventy-one percent of oilseed farmers used draught animals in production, with 50 percent using their own draught animals.

Private extension agents were a key player in providing extension services to oilseed growers, followed by cellphone applications and the internet. There was a large decrease in extension provided by NGOs for all crop farmers as well as for oilseed farmers.

More than half of oilseed farmers do not use fertilizer. Despite decreasing fertilizer prices, chemical fertilizer use remained low in oilseed production with 44.8 percent of farmers using chemical fertilizer in monsoon 2023. Further, chemical fertilizer use did not increase compared to the previous monsoon. For those who do apply chemical fertilizer, they apply close to the recommended amounts to their oilseed crops. Organic fertilizer use, on the other hand, is high in oilseed production, 63 percent of farmers applied it in the 2023 monsoon season. During this time and because of high animal ownership organic fertilizer was used by 74 percent of groundnut farmers and 76 percent of oilseed farmers in the Dry Zone.

Thirty-nine percent of oilseed farmers reported being impacted by climatic or other production shocks during this monsoon, with pests, diseases, and weeds (reported by 36 percent of farmers who experienced shocks), heavy rain/ storms (reported by 34 percent), droughts (reported by 22 percent), and irregular rainfall (reported by 21 percent) having significant adverse effects on yields.

Overall, oilseed productivity increased by an average of 2 percent during the 2023 monsoon compared to the previous year. Performance differed by crop with soybean and sesame experiencing moderate increases in yield, while groundnut and sunflower witnessed a decline in average yields of one percent. This mediocre performance stemmed from low input usage (particularly fertilizer), similar labor inputs, and a high occurrence of natural shocks, notably pests, diseases, and weeds, and heavy rain and storms. The yields of oilseeds, especially groundnut, sesame, and sunflowers are lower than neighboring countries, indicating the need for the oilseed sector to increase productivity.

Oilseed prices at the farm level increased by between 20 (soybean) and 45 (sunflower) percent, between the 2022 and 2023 monsoon seasons, reflecting changes in international oilseed prices as well as the depreciation of the MMK. Oilseed farmers faced significant issues in terms of marketing, including low prices for crops, insecurity, and having trouble reaching traders. These issues likely decreased the profitability of oilseed farming for affected farmers. Further, real – in terms of the cost of an average food basket – profits from oilseed farming during the monsoon of 2023 increased by between 2 (groundnut and soybean) and 12 (sesame) percent compared to the previous year. For sunflowers, real gross margins decreased. Sunflower farmers in project areas are growing sunflowers using residual rice moisture and almost no chemical fertilizer. While nominal profits increased by 33 percent since the previous monsoon, high price inflation hampered the increase in real profits. Nonetheless, with the governments focus on oilseeds and oilseed farmers perceiving higher profits when reflecting on this monsoon compared to last, a large share of farmers will continue to plant oilseeds in Myanmar, making improving productivity in the sector of critical importance.

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