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Rice Productivity and Profitability in Myanmar

Assessment of the 2025 Monsoon Season

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ABSTRACT

We analyzed rice productivity and profitability data for the 2025 monsoon season from the Myanmar Agriculture Performance Survey (MAPS), conducted at the beginning of 2026. The survey covered plots managed by 2,734 rice producers across all states and regions of the country. As no MAPS survey was conducted during the 2024 monsoon season, we compare performance changes with those observed in 2023. Our findings reveal the following:

1. **National rice productivity, measured on farmers' largest plots, declined by an average of 8 percent during the 2025 monsoon compared to 2023.** This lower productivity was primarily driven by reduced incentives for production as shown by reduced labor inputs, with more farmers adopting broadcasting methods, as well as an increased incidence of natural shocks, notably floods and heavy rains.
2. **The Delta agro-ecological zone, the country's principal rice-producing area, experienced a 7 percent decline in rice productivity in 2025 compared to 2023**, while the Coastal agro-ecological zone recorded the largest decline among all zones, with yields falling by 22 percent. This sharp reduction was partly driven by poor performance in Rakhine State, which was largely cut off from commercial input and output markets in 2025, considerably reducing the use of modern inputs in rice production.
3. **Thirty-six percent of paddy farmers reported being affected by climatic or other production shocks during the 2025 monsoon season**. Floods, reported by 10 percent of farmers, and heavy rains, reported by 15 percent, had significant adverse effects on yields. Among affected farmers, paddy yields declined by 34 percent and 15 percent, respectively.
4. **Significant changes in rice cultivation input costs were observed between the 2023 and 2025 monsoon seasons**. Prices of urea, the most important chemical fertilizer used by rice farmers, increased by 23 percent, while mechanization costs, measured through plowing costs, increased by 55 percent. Wages recorded the sharpest increases, likely reflecting escalating rural labor scarcity. Wages increased by 88 percent for men and 83 percent for women. Overall input expenditures per acre of rice cultivated increased by 63 percent.
5. **Farmgate paddy prices declined by 6 percent**, reflecting changes in international rice prices between the 2023 and 2025 monsoon seasons.
6. **Given rising input costs and declining paddy prices, paddy farming profits declined substantially and reached their lowest level in the last six years. Nominal profits per acre fell by 40 percent between 2023 and 2025.**
7. **Commercially obtained inputs are significantly associated with higher rice yields.** A doubling of commercial input expenditures is associated with a 34 percent increase in yields, while a doubling of chemical fertilizer use is associated with a 9 percent increase in yields, ceteris paribus. The use of organic fertilizer is also positively and significantly associated with higher yields, with users obtaining yields that are 4 percent higher on average.

The outlook for paddy production in 2026 appears highly uncertain due to several factors:

1. **The Iran war**: High fuel prices, as well as constrained fuel availability resulting from the Iran war, are likely to complicate transportation, irrigation, and agricultural mechanization, thereby affecting preparation for the next monsoon season. Fertilizer prices have also risen sharply and are expected to remain elevated for the foreseeable future (Arita et al. 2026), with likely negative consequences for use rates and profitability for paddy production during the 2026 monsoon (USDA 2026).

2. **Weather conditions**: Adverse weather conditions, as observed during the 2025 monsoon, can significantly affect yields. Most climate models predict El Niño conditions during the second half of 2026.[1] These conditions are typically associated with drier-than-average rainfall, which could lead to lower rice yields.
3. **Evolution of insecurity**: Insecurity is associated with reduced access to agricultural inputs and higher input costs where inputs remain available, thereby reducing profitability for farmers in these areas.
4. **Labor scarcity**: Labor availability is expected to remain constrained during the next monsoon season due to significant out-migration (linked to the Military Service Law).

These findings point to three key implications for Myanmar's rice sector:

1. **Ensuring access to agricultural inputs**: Myanmar's rice sector is highly commercialized, and access to commercial inputs is crucial for its performance. Risks associated with the Iran war, particularly regarding fuel and chemical fertilizer availability and prices, pose serious challenges for the functioning of the sector. While some commercial inputs could potentially be partially substituted with local production factors, such as agricultural labor replacing mechanized operations or organic fertilizers substituting for chemical fertilizers, a lack of access to these commercial inputs would nevertheless have major implications for rice production and national food security. Where feasible, encouraging such substitution may help mitigate some of these impacts.
2. **Expanding access to climate-resilient seeds and other climate-smart agricultural technologies**: As farmers are increasingly relying on self-preserved paddy seeds, there is an urgent need for them to have access to and to promote improved, high-yielding, and stress-tolerant rice varieties. Our findings show that farmers affected by floods and droughts experience substantially lower yields than unaffected farmers. Given the expected increase in weather-related shocks associated with climate change, as well as anticipated El Niño conditions, wider adoption of adapted seed varieties as well as other climate-smart agricultural technologies will be critical.
3. **Ensuring profitability in rice farming:** Rice farming profitability was severely stressed in 2025. This raises concerns about production incentives for the upcoming monsoon season, particularly as input costs continue to rise while rice prices – at least internationally – remain stagnant. Adjustment of the dual exchange rate system that currently depresses output prices would be beneficial. Ensuring adequate rice availability in the country may also require expanded access to credit schemes, or targeted input voucher programs for poorer smallholders, to sustain production and national food security.

[1] https://asmc.asean.org/asmc-seasonal-outlook/

1. INTRODUCTION

Rice is a very important product for farmers' livelihoods and for food security in Myanmar. Rice is the main staple, accounting for 51 and 62 percent of urban and rural calories consumed, respectively, making it crucial for food security in the country.[2] It is also the predominant crop for a large number of farmers, especially during the monsoon season, as well as an important export product. However, large international changes in commodity markets and local crises have hit the agri-food sector of Myanmar hard and have raised doubts about the performance of the agricultural sector overall and the rice sector in particular.

International rice prices dropped sharply in 2025. At the beginning of the year – before the start of the monsoon season – real rice prices were about one-third lower than a year earlier (Minten et al. 2025). This decline was largely attributed to favorable weather conditions, the removal of export restrictions by India—the world's largest rice exporter—and reductions in import tariffs by major importing countries seeking to counter high food prices (Dawe et al. 2024). As a result, real rice prices at the onset of the 2025 monsoon season reached their lowest level in the past 15 years (Minten et al. 2025). Myanmar's rice prices are closely linked to international markets, as nearly 20 percent of the country's rice production is typically exported (USDA 2025). Although Myanmar is the world's fifth-largest rice exporter, it remains a price-taker, meaning that it largely accepts prevailing global market prices. Consequently, local paddy producers were directly affected by the decline in international rice prices during the 2025 monsoon season, affecting local production incentives.

The assessment on farmers' rice productivity during the monsoon of 2025 presented in this paper is based on data from the Myanmar Agriculture Performance Survey (MAPS) that was conducted with 2,734 rice producers, in all states/regions of the country, over the period February – March 2026. Detailed questions were asked to farmers about their background, input use and input prices, farm management practices, rice output and output prices, and natural and other shocks during the monsoon of 2025.[3] This Working Paper presents the results from this assessment 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. Section 3 looks at prices of inputs and outputs over the last two monsoons. In Section 4, results on input use and farm management practices in rice production are presented. Section 5 looks at the prevalence of natural and other shocks. Section 6 presents results on rice productivity and profitability. We finish in the last section with conclusions and implications.

2. DATA

The Myanmar Agricultural Performance Survey (MAPS) is a sub-sample of almost 13,000 households interviewed by phone during the ninth round of the Myanmar Household Welfare Survey (MHWS) that was fielded in the second half of 2025 (van Asselt et al. 2026). 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 30th until March 19th, 2026. More than 4,500 farmers (4,553) could be reached for a follow-up interview.

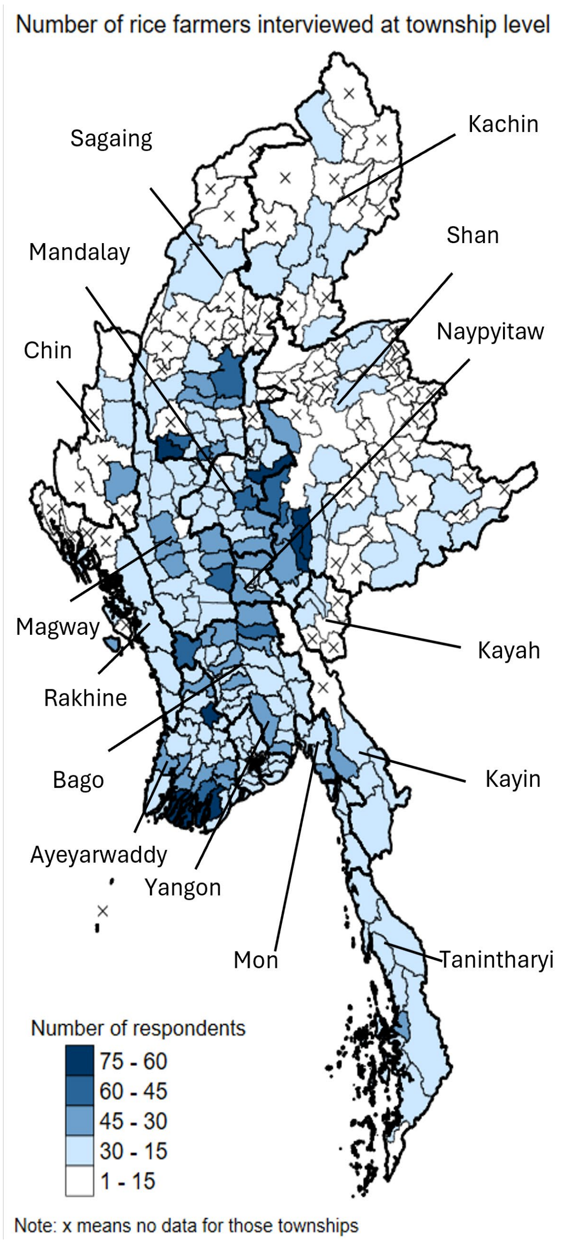
Of the 4,553 crop farmers in the MAPS, 2,734 farmers (60 percent) cultivated rice in the 2025 monsoon (Table 1). The number of rice farmers interviewed by township is shown in Figure 1,

[2] Estimated in 2015 (based on Myanmar Poverty, Livelihood, and Consumption Survey).

[3] In this paper, rice refers to rice in paddy form throughout.

indicating their spread in the country. The analysis that is presented in this paper focuses on these rice farmers. Table 1 shows the number of rice farmers interviewed by state and region compared to the rice area harvested as estimated by the Ministry of Agriculture, Livestock, and Irrigation (MoALI). MoALI evaluated the rice area cultivated during the year 2024/25 (monsoon and dry season combined) at 17.2 million acres. This implies that with the MAPS, approximately 1.6 rice farmers were interviewed, on average, for each 10,000 acres of rice cultivated in the country. The previous monsoon MAPS was fielded in 2023, and we therefore compare performance in 2025 to that year.

Figure 1. Sample of rice farmers, MAPS monsoon season 2025



Source: Authors' calculations based on MAPS, monsoon season 2025.

Table 1. Sample rice farmers, MAPS

		Monsoon		Paddy Harvested Area
	Crop Farmers	Rice Farmers		MOALI
	2025	2023	2025	2024/2025
By State/Region				
Kachin	54	108	38	479
Kayah	50	21	18	72
Kayin	108	52	45	536
Chin	91	33	39	58
Sagaing	618	532	405	2,027
Tanintharyi	153	54	56	230
Bago	518	399	432	3,125
Magway	499	234	233	668
Mandalay	512	251	237	526
Mon	171	76	94	750
Rakhine	100	56	51	873
Yangon	146	121	97	1,404
Shan	705	368	374	1,241
Ayeyarwady	727	435	531	5,125
Nay Pyi Taw	101	65	84	178
By agro-ecological zone				
Hills and Mountains	1,008	582	514	2,386
Dry Zone	1,730	1,082	959	3,399
Delta Region	1,391	1,031	1,060	9,654
Coastal Zone	424	110	201	1,853
Total	4,553	2,805	2,734	17,292

Source: Authors' calculations based on MAPS, monsoon season 2025.

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). We use the share of the respondents that reported living in a household where crops were harvested in the past 12 months as our measure of a crop farming household. The share of crop farming households was also calculated based on the same question in the 2017 Myanmar Living Conditions Survey (MLCS) implemented by the Myanmar Central Statistical Organization (CSO), UNDP, and The World Bank (CSO, UNDP & World Bank 2019), which was the last in-person nationally representative socioeconomic survey conducted in Myanmar. Basic weights are calculated to match the MAPS numbers to this crop farming population of the 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) (DOP, UNFPA 2020). An entropy correction approach was then implemented to additionally correct for large farm bias (using 5 land sizes) as well as to 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, rice 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 rice plot of rice producers in the monsoon season of 2025. 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 rice output. Farmers were also asked to estimate overall monetary input expenditures on these plots. While we collected these data from 2,734 rice farming households, caution is warranted in interpretation and extrapolation to national and state/region-wide rice production as we only collected this information on the largest rice plot.

We divide the country into four major agro-ecological zones that are commonly used in Myanmar and present our results at that level.[4] The average farm size of the interviewed rice farmers was 5.5 acres (Table 2). The biggest rice farms are seen in the Delta region (8.7 acres) while farms in the Hills and Mountains agro-ecological zone are substantially smaller (2.7 acres). Nationally, the size of the largest plot was on average 1.3 acres while the median was 1.0 acre. A large majority of rice plots at the national level are in lowlands (88 percent), whereas only 67 percent are in the Hills and Mountains zone.

Table 2. Descriptive statistics of rice farmers, MAPS

	Unit	Monsoon 2025				
		National	Hills	Dry	Delta	Coastal
Total number of rice farmers	Number	2,734	514	959	1,060	201
Background rice farm						
Average size rice farm - mean	Acres	5.5	2.7	3.7	8.7	6.6
Size largest plot - mean	Acres	1.3	1.2	1.1	1.6	1.4
Size largest plot - median	Acres	1.0	1.0	1.0	1.0	1.0
Land type largest plot						
Upland - steep slope	%	1.5	6.1	0.0	0.0	0.1
Upland - gentle slope	%	2.8	10.6	0.4	0.3	0.1
Upland- flat	%	5.3	15.1	3.5	1.4	0.4
Lowland	%	88.3	66.6	95.6	94.3	95.6
Deepwater	%	2.2	1.6	0.5	3.9	3.7
Background of main farm management decision maker of rice farms						
Age	Years	49.3	46.7	49.6	50.6	49.9
Gender	% male	81.0	74.8	82.5	84.6	77.3
Highest level of education achieved						
None	%	2.1	5.1	1.3	0.2	4.4
Standard 1-10	%	85.9	81.8	83.5	90.7	87.1
Bachelor	%	3.6	1.5	5.1	3.8	2.7
Other	%	8.4	11.5	10.1	5.4	5.7
Household members working regularly on the rice farm						
Adult male - mean	Number	1.2	1.2	1.2	1.2	1.2
Adult female - mean	Number	0.9	1.1	0.9	0.6	0.8
Children - mean	Number	0.0	0.0	0.0	0.0	0.0

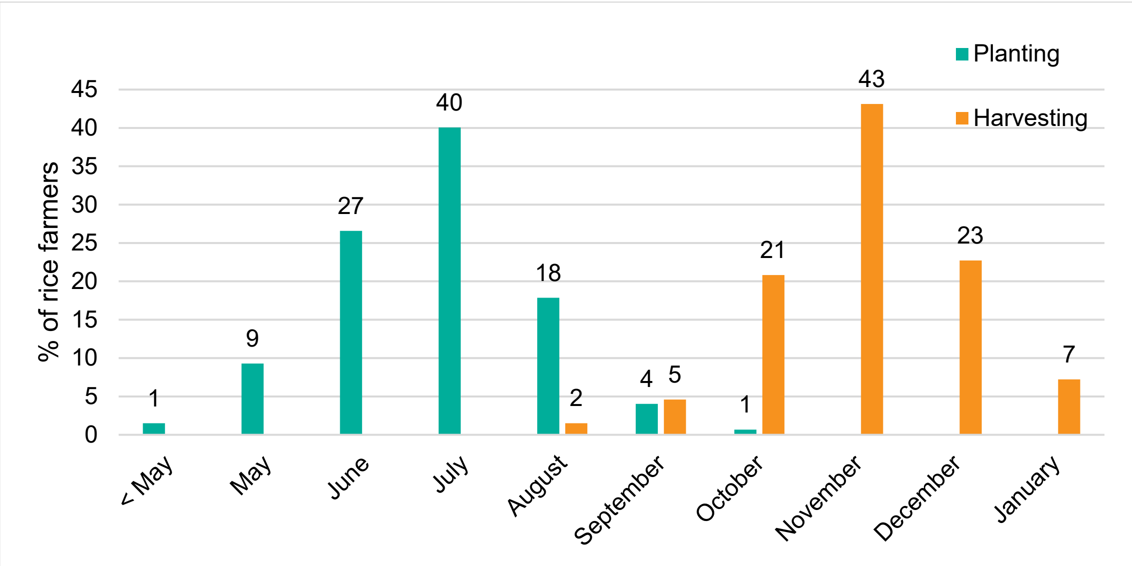
Source: Authors' calculations based on MAPS, monsoon season 2025.

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

The main farm management decision maker for these rice 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 86 percent indicated that they had completed standard levels from 1 to 10. Four percent reported that they had obtained a bachelor's degree. The number of household members working on the farm was on average 2.1. As in earlier surveys, there were relatively more adult males working on the farm (55 percent of all labor) than females (40 percent of all labor) (Lambrecht et al. 2022), while work by children (defined as less than 15 years old) was reported by respondents to be less important.

MAPS was conducted from the end of January until the beginning of March to assess the situation of the monsoon crops of 2025. We asked farmers to indicate what they considered the main planting and harvest month of paddy on their most important paddy plot (Figure 2). Planting was mostly done during the months of June (27 percent of farmers), July (40 percent), and August (18 percent). The main harvest month was November as reported by 43 percent of farmers. Twenty-three percent reported December and 21 percent reported October as their main harvest months. Seven percent of the farmers reported that their main harvest was during the month of January, just before MAPS was fielded. It seems therefore that at the time of the survey, most of the monsoon crops were 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 paddy 2025



Source: Authors' calculations based on MAPS, monsoon season 2025.

3. INCENTIVES FOR RICE CULTIVATION – INPUT AND OUTPUT PRICES

Input prices for rice farmers have increased substantially between the monsoons of 2023 and 2025 (Table 3). First, chemical fertilizer prices reflected by the price of urea, the most important fertilizer used by rice farmers, have increased by 23 percent on average (the median by 26 percent) during the monsoon of 2025 compared to two years earlier. Table 3 also shows that urea prices are relatively higher in the Hill and Mountain and Coastal areas compared to the rest of the country, likely reflecting distances from the entry points of fertilizer imports from abroad as well as problems with domestic transport to these often conflict-affected areas.

Second, agricultural mechanization has rapidly taken off in the last decade and is now being used by a large majority of crop farmers (Belton et al. 2022). As a measure of the costs of mechanization, Table 3 presents the prices for plowing one acre of land by a four-wheel tractor. Farmers report that those costs increased by 55 percent on average during the monsoon of 2025 compared to 2023, partly reflecting the substantially higher cost of fuel in the country over these two seasons. The mechanization costs were especially high in Hills and Mountain and Coastal areas.

Table 3. Input and output prices in paddy rice cultivation, monsoon 2023 and 2025

	Unit	Monsoon 2023	Monsoon 2025				
		National	National	Hills	Dry	Delta	Coastal
Inputs							
Urea price (kg)	Mean	1,979	2,427	2,581	2,451	2,260	2,672
	Median	1,900	2,400	2,400	2,400	2,200	2,600
Costs plowing 1 acre (4-wheel)	Mean	53,064	82,416	111,708	82,819	75,055	92,718
	Median	50,000	75,000	100,000	80,000	70,000	90,000
Daily wage man	Mean	9,021	16,982	17,978	15,076	17,115	21,073
	Median	8,000	15,000	16,000	15,000	15,000	20,000
Daily wage woman	Mean	7,305	13,392	14,258	12,029	13,586	15,459
	Median	7,000	12,000	15,000	12,000	15,000	15,000
Output							
Paddy price (kg)	Mean	1,127	1,063	1,182	1,320	795	965
	Median	1,053	957	1,170	1,276	670	861

Source: Authors' calculations based on MAPS, monsoon season 2023 (round 5) and monsoon season 2025 (round 8).

Third, the use of wage labor in agricultural activities is very common in Myanmar. It has been shown that wage levels in the past (before the COVID-19 pandemic) had been increasing fast because of the increasing possibilities of alternative employment in cities and neighboring countries. This partly explains the rapid adoption of agricultural mechanization in the country (Belton et al. 2022). Table 3 shows that the average daily wages of hired labor of men increased in nominal terms by 88 percent and by 83 percent for women this monsoon compared to 2023.

In contrast to the input costs, we see decreases in paddy prices, negatively impacting the profitability of rice production. Table 3 shows that at the national level average prices for paddy decreased by 6 percent (the median shows a decrease of 9 percent). Paddy prices were relatively lower in the Delta region, likely reflecting their surplus status, and the Coastal areas, possibly because of major problems in the commercialization of paddy in that area.

4. INPUT USE AND FARM MANAGEMENT PRACTICES

In this section, we look at input and farm management practices used in paddy cultivation, including seeds, agro-chemical and fertilizer use, and labor and mechanization as well as assess overall commercial input expenditures. Rice farmers in Myanmar predominantly rely on their own saved rice seeds from their previous harvest (Table 4). For the monsoon of 2025, 62 percent of the seed planted was own saved seeds, 19 percent of the rice farmers indicated that they bought seeds from agri-input suppliers or the government, while 18 percent bought them from other farmers. Purchased seeds from formal sources are usually improved seeds. 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 rice yields overall (Spielman and Kennedy 2016; Denning et al. 2013). We also note sub-national differences in the source of rice seeds. Fewer farmers use purchased seeds from agri-input retailers or the government in the Coastal areas while rice farmers in the Hills and Mountains and the Dry zone rely the most on purchased seeds.

Table 4. Seed use, monsoon 2025

	Unit	National	Hills	Dry	Delta	Coastal
Seed source						
Purchased from agri-input retailer or government	%	19.1	26.1	24.1	13.2	4.5
Purchased from other farmer	%	17.9	16.1	17.4	19.4	18.6
Left over (unused) purchased seed from last year	%	0.3	0.4	0.2	0.3	0.3
Saved (harvested) from last year	%	62.4	56.6	58.1	66.9	76.5
Other	%	0.3	0.7	0.2	0.2	0.0
Total	%	100.0	100.0	100.0	100.0	100.0

Source: Authors’ calculations based on MAPS, monsoon season 2025.

Table 5 gives an overview of fertilizer and other agro-chemical use on the largest rice plot in the monsoon of 2025. We see relatively high shares of farmers who use chemical fertilizers and other agro-chemicals, with 91 percent of the farmers using at least one agro-chemical during the 2025 monsoon. Eighty-one percent of the farmers used urea on their largest plot. The share of other types of fertilizers being used is much lower than urea. Thirty-nine percent of the farmers used compound 15-15-15 while other compound fertilizers were used by 9 percent of the farmers in the monsoon of 2025. Organic fertilizers were used by 46 percent, lime/gypsum by 12 percent, herbicides by 53 percent, and other pesticides by 47 percent.

Table 5. Agro-chemicals and fertilizer use on paddy rice cultivation, monsoon 2025

	Unit	National	Hills	Dry	Delta	Coastal
Agro-chemical use	%	91.2	89.9	97.2	92.5	66.5
Chemical fertilizer						
Urea	%	81.5	77.9	89.3	82.4	57.3
Ammonium sulphate	%	0.9	0.1	0.6	1.8	0.8
Compound 15-15-15	%	38.9	39.7	45.3	38.2	14.2
Other compound combined	%	9.3	15.7	11.7	3.6	5.1
Tsuper	%	8.0	9.4	5.3	7.4	17.4
Potash	%	2.2	0.8	2.5	2.6	3.1
Low quality fertilizer	%	0.2	0.0	0.1	0.4	0.0
Other fertilizer and agro-chemicals						
Organic fertilizer	%	46.1	48.0	57.8	32.3	54.4
Lime - gypsum	%	12.4	5.4	11.0	18.7	10.2
Herbicides	%	52.9	50.2	53.9	54.7	15.4
Other pesticides	%	47.2	47.7	52.3	50.4	21.3

Source: Authors’ calculations based on MAPS, monsoon season 2025

We further note that chemical fertilizer use is widespread in all agro-ecological zones. In the Dry Zone, 97 percent of farmers were using chemical fertilizer compared to 66 percent in the Coastal areas. Organic fertilizer use is significantly higher in the Dry Zone (58 percent of rice farmers used it on their largest rice plot), likely linked to the higher prevalence of livestock ownership in that area. The use of lime, gypsum, and herbicide is most prevalent in the Delta region.

During the monsoon of 2025, rice farmers used 80 kgs of fertilizer per acre on average (Table 6). Urea is the most important fertilizer used on rice, making up 59 percent of all fertilizers used. Fertilizer use on rice differs between regions and states in the country (Table 6). Fertilizer used on rice in the monsoon season is highest in the Dry Zone (91 kgs per acre) and the Hills and Mountains (92 kgs per acre) and lowest in the Coastal areas (45 kgs per acre).

Table 6. Chemical fertilizer use in paddy rice cultivation (kgs per acre), monsoon 2025

	Unit	National	Hills	Dry	Delta	Coastal
Urea - kg	mean	46.8	46.3	53.7	45.1	27.9
	median	50.0	49.4	50.0	50.0	16.3
Ammonium sulphate - kg	mean	0.5	0.0	0.3	0.9	0.9
	median	0.0	0.0	0.0	0.0	0.0
Other fertilizer - kg (compound 15-15-15)	mean	21.5	26.8	25.5	18.0	5.8
	median	0.0	0.0	0.0	0.0	0.0
Other fertilizer - kg (other compound combined)	mean	5.8	11.2	7.3	1.6	2.3
	median	0.0	0.0	0.0	0.0	0.0
Other fertilizer - kg (T_super)	mean	4.1	7.4	2.8	2.4	7.5
	median	0.0	0.0	0.0	0.0	0.0
Other fertilizer - kg (Potash)	mean	0.8	0.4	1.3	0.7	0.7
	median	0.0	0.0	0.0	0.0	0.0
Other fertilizer - kg (Low quality - aukkone)	mean	0.1	0.0	0.0	0.3	0.0
	median	0.0	0.0	0.0	0.0	0.0
Total fertilizer - kg	mean	79.7	92.2	91.0	69.0	45.2
	median	75.0	85.7	87.5	62.5	25.0

Source: Authors' calculations based on MAPS, monsoon season 2025.

The MAPS also captures the extent to which rice farmers relied on hired labor, draught animals, and mechanization during the monsoon of 2025 (Table 7). During the monsoon of 2025, only 12 percent of the rice farmers relied exclusively on their own family labor while 88 percent used outside help. On top of their own household labor, 66 percent of rice farmers used solely hired labor, 7 percent used exchange labor, and 15 percent used a combination of hired and exchange labor. Substantial differences are noted over agro-ecological zones with 91 percent of rice farmers in the Dry Zone relying on outside help while farmers in the Hills and Mountains rely more on their own labor. However, outside help is still high, with 86 percent of farmers relying on hired labor. In contrast with other zones, we see relatively more reliance on exchange labor in the Hills. In the Delta area, 75 percent of rice farms relied on hired labor.

Transplanting of rice, which is typically very labor intensive, was practiced by 48 percent of rice farmers. It was most prevalent in the Dry Zone, where 60 percent of rice farmers used this method, and least common in the Delta, where only 31 percent did so. The remaining 52 percent of farmers did not transplant rice but instead relied on randomly broadcasting soaked or sprouted seeds (20 percent), row-planting soaked or sprouted seeds (2 percent), randomly broadcasting dry seeds (27 percent), or row-planting dry seeds (2 percent). Almost all farmers (97 percent of rice farmers) did not use machines for seeding.

Table 7. Labor use and mechanization in paddy rice cultivation, monsoon 2025

	Unit	National	Hills	Dry	Delta	Coastal
Non-family labor						
Hired	%	65.9	48.6	66.7	74.9	74.0
Exchange	%	6.6	10.8	7.8	3.7	2.6
Both	%	15.5	26.4	16.5	8.1	11.3
No	%	12.0	14.1	9.0	13.3	12.1
Draught animals						
Hired	%	13.9	9.0	26.3	5.4	14.5
Own	%	18.0	4.4	35.8	9.0	24.1
Both	%	1.2	0.9	2.0	0.6	1.1
No	%	67.0	85.8	35.9	85.0	60.3
Seeding methods						
Transplanting	%	48.1	54.1	60.4	30.8	55.0
Broadcasting soaked seeds (random)	%	20.5	10.3	12.3	32.7	30.7
Row-planting soaked seeds	%	2.3	2.9	3.3	1.2	0.9
Broadcasting dry seeds (random)	%	27.3	29.1	21.2	35.2	13.2
Row-planting dry seeds	%	1.8	3.5	2.9	0.2	0.1
Means of seeding						
By hand	%	96.5	96.8	94.5	97.5	100.0
Blower	%	2.1	2.9	2.4	1.9	0.0
Drum seeder	%	1.3	0.4	2.9	0.6	0.0
Other machine	%	0.1	0.0	0.2	0.0	0.0
Tractor for plowing						
Hired	%	56.7	48.6	63.8	57.1	49.6
Own	%	28.1	39.2	18.6	31.9	18.3
Both	%	3.3	2.7	1.9	5.3	1.7
No	%	11.9	9.5	15.7	5.7	30.4
Combine-harvester						
Hired	%	53.9	30.0	55.2	71.6	43.3
Own	%	1.3	0.8	1.2	2.1	0.5
No	%	44.7	69.2	43.6	26.4	56.2

Source: Authors' calculations based on MAPS, monsoon season 2025

Rice farmers in Myanmar rely heavily on mechanization for their rice farm activities. Draught animals have traditionally been very important in rice cultivation but were only used by 33 percent of rice farmers. Draught animals are still important in the Dry Zone where 64 percent of the rice farmers used them. Nationally, 88 percent of farmers used a tractor for plowing plots and 55 percent of the farmers used combine-harvesters to harvest paddy. Combine-harvesters are relatively less used in the Hills and Mountains, likely due to the higher share of upland rice cultivation making it more difficult for combine-harvesters to move around there. Most rice farmers relied on mechanization service providers for plowing, but it is noteworthy that 28 percent used their own tractor for plowing. Own tractor use is especially high in the Hills and Mountains.

Table 8 shows how input use and adoption practices of major agricultural technologies in paddy cultivation have changed over the last four monsoons. Despite the declines of rice paddy prices, we see an increase in the share of paddy farmers using chemical fertilizer between 2023 and 2025. We also note substantial changes in seed use and rice seedling technologies over time. It is concerning that farmers have over time increased their reliance on their own saved seeds, with improved seeds delivered by private or public institutions becoming much less important. The low prices of paddy rice as well as problems with accessing agricultural labor have seemingly led to the increasing dis-adoption of transplanting and the increasing adoption of the yield-reducing direct seeding (broadcasting) technology. In 2025, it was 4 percentage points lower than in 2020 and 13 percentage points lower than in 2023, when rice prices were high. Finally, little change is seen in the use of mechanization, but we note a slight increase since 2023 in the use of tractors for plowing and of combine-harvesters.

Table 8. Changes in input use and management practices in paddy cultivation on largest rice plot, monsoon 2020 to 2024

	Unit	2020	2021	2022	2023	2025
Saved (harvested) seed from last year	%	43.8	50.3	55.5	59.5	62.4
Broadcasting	%	43.9	44.8	43.7	35.3	47.8
Tractor for plowing	%	85.3	85.8	82.4	84.3	88.1
Combine-harvester	%	59.8	59.9	49.5	46.2	55.3

Source: Authors' calculations based on MAPS, monsoon season 2025, 2023, 2022, 2021.

Finally, we assess overall (commercial) input expenditures on paddy rice. Commercial input expenditures might give a good indication of the intensity of input use in rice production.[5] Table 8 shows that input expenditures per acre increased on average by 63 percent, and by 60 percent using the median, during the 2025 monsoon compared to the 2023 monsoon. The highest input expenditures per acre were noted in the Hills and Mountains and the Dry Zone (Table 9). Input expenditures were lowest in Coastal areas.

Table 9. Monetary input expenditures (MMK/acre) on paddy rice

	Unit	2020	2021	2022	2023	2025
Mean	387,848	631,865	751,667	696,651	525,598	489,270
Median	350,000	560,000	666,667	650,000	500,000	406,667

Source: Authors' calculations based on MAPS, monsoon season 2023 (round 5) and monsoon season 2025 (round 8).

5. NATURAL AND OTHER SHOCKS

Agriculture is a risky business. Climatic shocks are generally important risks in agricultural production.6 When asked about the incidence of natural or other production shocks, 29 and 36 percent of the rice farmers indicated that they were negatively impacted by at least one of these shocks in 2023 and 2025 respectively (Table 10). Weather events were therefore seemingly not favorable for agricultural production in 2025 in general. Drought negatively impacted 5 percent of

[5] 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 rice production as there are a number of non-monetary inputs going into rice production as well, such as family labor, organic fertilizer, and animal traction. Second, monetary input expenditures were approximated by asking farmers for a simple measure of what they spent on their largest rice 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 up 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 this represents a caveat for further analysis.

[6] 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 (Takeshima et al. 2026).

rice farmers in 2023 while only 3 percent were impacted in 2025. There were more complaints in 2025 of floods (10 percent in 2025; 7 percent in 2023) and heavy rains (15 percent in 2025; 7 percent in 2023). Incidences of pests, diseases, and weeds also have a high frequency overall. They were mentioned by 11 percent of the rice farmers in 2025, slightly lower than in the monsoon of 2023.

Table 10. Natural and other production shocks faced by rice farmers

		Monsoon 2025				
	Unit	National	Hills	Dry	Delta	Coastal
Crop negatively affected by any shock	%	36.0	35.9	33.8	37.6	37.7
If yes, which one?						
Drought	%	2.7	2.8	5.4	0.7	0.8
Poor access to irrigation water	%	0.4	0.2	0.8	0.1	0.8
Irregular rain	%	3.2	2.3	4.6	2.6	2.1
Heavy rain	%	15.3	16.8	14.8	14.6	15.9
Floods	%	10.1	12.6	5.6	12.3	11.2
Flash floods	%	0.3	0.3	0.2	0.3	0.1
Extreme temperature	%	0.4	1.0	--	0.4	--
Pest, diseases, weeds	%	11.3	12.2	10.4	11.8	10.5
Damage by animals	%	4.0	1.4	1.9	7.7	4.1
Damage by rats	%	2.3	0.8	3.5	2.6	1.1
Storm	%	0.5	0.3	0.5	0.4	2.1
Others	%	0.9	1.1	0.5	1.1	1.0
		Monsoon 2023				
Crop negatively affected by any shock	%	29.3	26.6	28.6	29.4	37.5
If yes, which one?						
Drought	%	4.6	2.8	9.2	2.7	1.0
Poor access to irrigation water	%	0.6	0.2	1.3	0.3	--
Irregular rain	%	2.7	1.7	3.5	3.4	0.1
Heavy rain	%	7.5	5.6	7.5	7.6	11.7
Floods	%	7.3	6.8	4.5	8.4	14.5
Flash floods	%	0.8	0.2	0.4	1.5	0.6
Extreme temperature	%	0.2	0.5	--	0.2	0.1
Pest, diseases, weeds	%	12.9	12.4	10.2	13.1	22.1
Damage by animals	%	2.0	1.2	0.8	3.9	1.3
Damage by rats	%	1.5	1.4	1.5	1.9	--
Storm	%	1.6	1.1	1.2	0.5	8.5
Others	%	1.0	1.7	0.2	1.2	0.7

Source: Authors' calculations based on MAPS, monsoon season 2025.

Shocks have impacted rice farmers differently across agro-ecological zones and states/regions (Table 10). Cyclone Mocha – a category 4 tropical cyclone – made landfall in Myanmar in the middle of May 2023, causing widespread damage especially in Rakhine, Chin, Magway, Sagaing, and Kachin. While this cyclone hit Myanmar before the onset of the monsoon of 2023, some of these areas were still affected by the aftermath of that cyclone during rice cultivation in 2023. Effects of flooding and heavy rains were therefore more localized than in 2025. In 2025, almost all agro-ecological zones suffered equally from heavy rains and floods (the latter is less reported in the Dry Zone though).

6. RICE PRODUCTIVITY AND PROFITABILITY

National yields—based on reported yields from the largest plot—averaged 1,162 kgs per acre, or 2.9 tons per hectare, in the 2025 monsoon season (Table 11). Compared to the 2023 monsoon season, yields decreased by 8 percent on average. Across agro-ecological zones, yields declined by 3 percent in the Hills and Mountains, and by 7 percent in the Delta and the Dry Zone. The largest decline was observed in the Coastal areas, where yields fell by 22 percent. This sharp decline was partly driven by poor performance in Rakhine State, which was largely cut off from commercial input and output markets in 2025, considerably reducing the use of modern inputs in rice production.

Table 11. Paddy rice yields on the largest plot (kgs/acre), monsoon 2020 to 2025

	2020		2021		2022		2023		2025	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Hills	1,231	1,045	1,222	1,045	1,174	1,045	1,135	1,045	1,101	1,045
Dry	1,383	1,437	1,444	1,463	1,317	1,393	1,403	1,463	1,312	1,359
Delta	1,277	1,254	1,237	1,229	1,167	1,129	1,265	1,254	1,181	1,150
Coastal	1,219	1,087	1,241	1,176	982	914	1,114	1,021	868	836
Average Rice Farmer	1,295	1,254	1,302	1,254	1,199	1,150	1,261	1,254	1,179	1,212
Area-weighted national average*	1,283		1,277		1,177		1,257		1,162	

*: Using the cultivated areas of MoALI.
Source: Authors' calculations based on MAPS.

To understand associates of paddy rice yields, we run a regression in which we try to explain differences in yields between paddy farmers based on the quality of the soil, inputs used in the production process, shocks that the farmer faced, location of the farmer, as well as the characteristics of the farmer. We run two specifications. In the first specification, we aggregate the costs of all input expenditures – as reported by the famers – while in the second, we separate out some of the inputs used (chemical fertilizer, organic fertilizer, lime/gypsum, pesticides, and hired labor). The results are presented in Table 12. We use the logarithm of yields as the dependent variable, allowing interpretation of dummies as percentage effects. The major findings are the following.

First, land quality is a major associate of paddy yields. Paddy grown on lowlands has the highest yields while paddy grown on very steep upland slopes have the lowest. Focusing on the results of specification 1, yields on the former were 44 percent higher in 2025 compared to very steep plots. Lowland yields are 18 percent higher than deepwater fields and 20 percent higher than (flat) upland plots. Poor quality soils – as reported by farmers – show yields that are 30 percent lower.

Second, input expenditures – such as fertilizer, mechanization, agro-chemicals but also other commercial inputs – used in the paddy production process matter enormously. A doubling of input expenditures is associated with 34 percent higher yields. When we look in the second specification at the association of chemical fertilizer with yields, the results show that a doubling of chemical fertilizer use is associated with a 9 percent increase in yields, ceteris paribus. The use of organic fertilizer is also positively and significantly associated with a yield increase: organic fertilizer use is associated with a 4 percent higher yield.

Table 12. Associates of paddy rice yields on the largest plot – log (kgs/acre), monsoon 2025

		Specification 1			Specification 2		
	Unit	Coefficient	t-value	Sign.	Coefficient	t-value	Sign.
Land quality							
Land type (default = very steep)							
Upland - gentle slope	Yes=1	0.15	0.89		0.14	0.79	
Upland – flat	Yes=1	0.24	1.72	*	0.30	1.95	**
Low land	Yes=1	0.44	3.26	***	0.50	3.41	***
Deepwater	Yes=1	0.26	1.72	*	0.34	2.10	**
Fertility soil (default = good)							
Fair	Yes=1	-0.09	-4.24	***	-0.10	-4.65	***
Poor	Yes=1	-0.30	-6.32	***	-0.33	-6.97	***
Working household members	Log (Number)	0.03	1.12		0.03	0.90	
Input expenditures	Log (Value)	0.34	14.11	***			
Chemical fertilizer use	Log (Kgs)				0.09	10.32	***
Organic fertilizer use	Yes=1				0.04	1.95	*
Lime/gypsum use	Yes=1				0.03	1.58	
Pesticide use	Yes=1				0.05	1.98	**
Hired labor use	Yes=1				0.07	2.02	**
Drought	Yes=1	-0.58	-4.99	***	-0.61	-4.94	***
Flood	Yes=1	-0.34	-6.95	***	-0.33	-6.79	***
Heavy rain problem	Yes=1	-0.15	-4.94	***	-0.16	-5.16	***
Pests and diseases	Yes=1	-0.17	-5.40	****	-0.16	-5.03	***
State/Region dummy included		Yes					
Household characteristics included		Yes					
Intercept		2.16	5.65	***	6.16	27.18	***
Number of Observations		2,636			2,665		
R2		0.32			0.28		

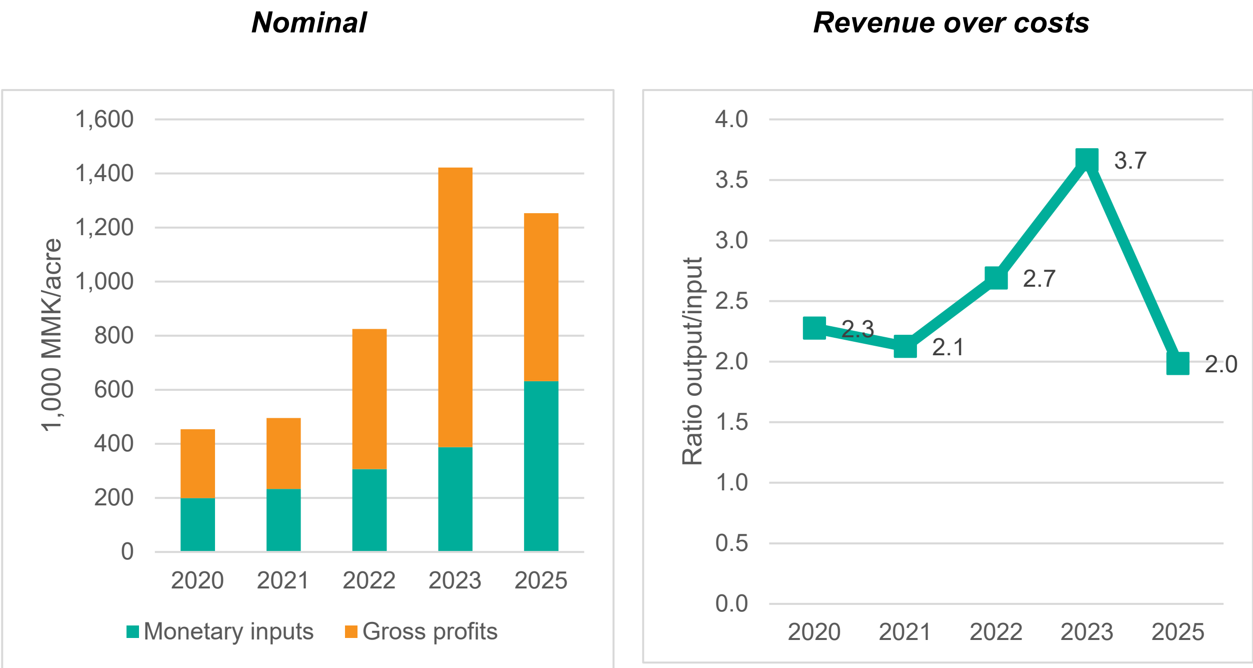
Significance: * p < 0.10, ** p < 0.05, *** p < 0.01
Source: Authors' calculations based on MAPS.

Third, weather shocks have enormous negative impacts. A reported drought by the farmer reduces yields by 58 percent while floods reduce them by 34 percent. As found in previous assessments in Myanmar, it seems that droughts have especially devastating effects on paddy cultivation (Takeshima et al. 2026). Heavy rain and pests and diseases reduce yields by 15 and 17 percent respectively.

Finally, we assess how gross profits changed across different monsoon seasons by combining data on average yields, paddy prices, and commercial expenditures per acre. We observe a significant decline in (nominal) gross revenues per acre in the most recent monsoon season (2025): they fell by 12 percent compared to the 2023 monsoon season (Figure 3). As commercial expenditures increased by 63 percent between 2023 and 2025, gross profits—reflecting returns to family farm labor and land use—for rice farmers declined substantially over this period. Profits (nominal) in the 2025 monsoon season were 40 percent lower than in 2023. To further examine profitability trends, we calculate the ratio of revenue per acre to monetary costs. This ratio deteriorated significantly in 2025, declining by 46 percent compared to the 2023 monsoon season.

While 2023 was an exceptionally profitable year and may therefore not be the most appropriate comparison year, Figure 3 nonetheless shows that profitability in monsoon paddy farming in 2025 stood at its lowest level in the past six years.[7]

Figure 3. Gross nominal revenue and real - in terms of the cost of an average food basket - profits per acre in paddy production, monsoons 2020 to 2025



Source: Authors' calculations based on MAPS, monsoon season 2025 (round 8), monsoon (round 5), monsoon 2022 (round 3), and monsoon season 2021 and 2020 (round 1).

7. CONCLUSIONS AND IMPLICATIONS

We analyzed rice productivity and profitability data for the 2025 monsoon season from the Myanmar Agriculture Performance Survey (MAPS), conducted at the beginning of 2026. The survey covered plots managed by 2,734 rice producers across all states and regions of the country. As no MAPS survey was conducted during the 2024 monsoon season, we compare performance changes with those observed in 2023. Our findings reveal the following:

1. **National rice productivity, measured on farmers' largest plots, declined by an average of 8 percent during the 2025 monsoon compared to 2023.** This lower productivity was primarily driven by reduced incentives as shown by reduced labor inputs, with more farmers adopting broadcasting methods, as well as an increased incidence of natural shocks, notably floods and heavy rains.
2. **The Delta agro-ecological zone, the country's principal rice-producing area, experienced a 7 percent decline in rice productivity in 2025 compared to 2023**, while the Coastal agro-ecological zone recorded the largest decline among all zones, with yields falling by 22 percent. This sharp reduction was partly driven by poor performance in Rakhine State, which was largely cut off from commercial input and output markets in 2025, considerably reducing the use of modern inputs in rice production.
3. **Thirty-six percent of paddy farmers reported being affected by climatic or other production shocks during the 2025 monsoon season**. Floods, reported by 10 percent of

[7] We have no survey data for 2024. However, the FAO all price index was in November 2025 20 percent lower than in November 2024.

farmers, and heavy rains, reported by 15 percent, had significant adverse effects on yields. Among affected farmers, paddy yields declined by 34 percent and 15 percent, respectively.

4. **Significant changes in rice cultivation input costs were observed between the 2023 and 2025 monsoon seasons**:
   5.1 Prices of urea, the most important chemical fertilizer used by rice farmers, increased by 23 percent, while mechanization costs, measured through plowing costs, increased by 55 percent.
   5.2 Wages recorded the sharpest increases, likely reflecting escalating rural labor scarcity. Wages increased by 88 percent for men and 83 percent for women.
   5.3 Overall input expenditures per acre of rice cultivated increased by 63 percent.
5. **Farmgate paddy prices declined by 6 percent**, reflecting changes in international rice prices between the 2023 and 2025 monsoon seasons.
6. **Given rising input costs and declining paddy prices, paddy farming profits declined substantially and reached their lowest level in the last six years. Nominal profits per acre fell by 40 percent between 2023 and 2025.**
7. **Commercially obtained inputs are significantly associated with higher rice yields.** A doubling of commercial input expenditures is associated with a 34 percent increase in yields, while a doubling of chemical fertilizer use is associated with a 9 percent increase in yields, ceteris paribus. The use of organic fertilizer is also positively and significantly associated with higher yields, with users obtaining yields that are 4 percent higher on average.

The outlook for paddy production in 2026 appears highly uncertain due to several factors:

1. **The Iran war**: High fuel prices, as well as constrained fuel availability resulting from the Iran war, are likely to complicate transportation, irrigation, and agricultural mechanization, thereby affecting preparation for the next monsoon season. Fertilizer prices have also risen sharply and are expected to remain elevated for the foreseeable future (Arita et al. 2026), with likely negative consequences for use rates and profitability for paddy production during the 2026 monsoon.
2. **Weather conditions**: Adverse weather conditions, as observed during the 2025 monsoon, can significantly affect yields. Most climate models predict El Niño conditions during the second half of 2026. These conditions are typically associated with drier-than-average rainfall, which could lead to lower rice yields.
3. **Evolution of insecurity**: Insecurity is associated with reduced access to agricultural inputs and higher input costs where inputs remain available, thereby reducing profitability for farmers in these areas.
4. **Labor scarcity**: Labor availability is expected to remain constrained during the next monsoon season due to significant out-migration (linked to the Military Service Law).

These findings point to three key implications for Myanmar's rice sector:

1. **Ensuring access to agricultural inputs**: Myanmar's rice sector is highly commercialized, and access to commercial inputs is crucial for its performance, as illustrated by the deterioration observed in Rakhine. Risks associated with the Iran war, particularly regarding fuel and chemical fertilizer availability and prices, pose serious challenges for the functioning of the sector. While some commercial inputs could potentially be partially substituted with local production factors, such as agricultural labor replacing mechanized operations or organic fertilizers substituting for chemical fertilizers, a lack of access to these commercial inputs would nevertheless have major implications for rice production and national food security. Where feasible, encouraging such substitution may help mitigate some of these impacts.

2. **Expanding access to climate-resilient seeds and other climate-smart agricultural technologies**: Although farmers are increasingly relying on self-preserved paddy seeds, there is an urgent need to promote improved, high-yielding, and stress-tolerant rice varieties. Our findings show that farmers affected by floods and droughts experience substantially lower yields than unaffected farmers. Given the expected increase in weather-related shocks associated with climate change, as well as anticipated El Niño conditions, wider adoption of adapted seed varieties as well as other climate-smart agricultural technologies will be critical.
3. **Ensuring profitability in rice farming:** Rice farming profitability was severely stressed in 2025. This raises concerns about production incentives for the upcoming monsoon season, particularly as input costs continue to rise while rice prices – at least internationally – remain stagnant. Adjustment of the dual exchange rate system that currently depresses output prices would be beneficial. Ensuring adequate rice availability in the country may also require expanded access to favorable credit schemes, or targeted input voucher programs for poorer smallholders, to sustain production and national food security.

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