MYANMAR

IFPRI

STRATEGY SUPPORT PROGRAM RESEARCH NOTE 115 NOVEMBER 2024

Rice Productivity in Myanmar

Assessment of the 2024 dry season

Key Findings

We analyze paddy rice productivity and profitability data for the dry seasons of 2023 and 2024, based on the Myanmar Agriculture Performance Survey (MAPS) fielded in the period of July 29th to September 16th, 2024. The survey covered plots of 825 rice paddy producers. It is found that:

- Prices of inputs used in paddy production – labor and mechanization – increased significantly between these two growing seasons by between 36-38 and 59 percent respectively, on average. On the other hand, urea prices declined by 1 percent. Paddy prices at the farm increased by 14 percent.
- Nominal profits for paddy rice farmers increased over the last two seasons. At the same time, price inflation has been high in the country. Therefore, real profits from paddy rice farming, which are nominal prices corrected by the change in the cost of an average food basket, decreased by 15 percent during the dry season of 2024 compared to the dry season of 2023. However, real profits were still higher than two and three years ago.
- Rice productivity at the national level during the dry season of 2024 on farmers' largest rice plot was slightly higher (+6.9 percent) than in the previous dry season.
- Six percent of the rice farmers reported to have been affected by flooding during the dry season, even before cyclone Yagi affected many farmers in the beginning of September 2024.

Recommended Actions

- As paddy prices have gone up compared to last year, rice prices have gone up substantially as well, making the costs of Myanmar's staple food unaffordable for some consumers, especially for the most vulnerable ones. Expansion of safety nets, targeted or self-targeted to the poorest, would therefore be beneficial.
- The cyclone Yagi has affected a significant share of monsoon producers. Assistance for farmers in these areas to recover from floods in time for the post-/pre-monsoon is called for.

USAID FROM THE AMERICAN PEOPLE

FEED THE FUTURE The U.S. Government's Global Hunger & Food Security Initiative

Introduction

Rice is an extremely 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.[1] Large international changes in commodity markets and insecurity in the country have raised doubts on the performance of the agricultural sector overall and the rice sector in particular. The assessment on farmers' rice productivity during the dry season – typically representing less than 20 percent of annual production of paddy – of 2024 presented in this research note is based on data from the Myanmar Agriculture Performance Survey (MAPS) that was conducted with 825 rice producers, spread over all states/regions of the country, over the period July 2024 – September 2024. 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 dry season of 2023 and 2024.[2] This research note presents the results from that assessment.

Data

The Myanmar Agricultural Performance Survey (MAPS) is a sub-sample of almost 13,000 households interviewed by phone during the seventh round of the Myanmar Household Welfare Survey (MHWS) that was fielded in the second quarter of 2024 (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 4,740 households that were identified as crop farmers in the MHWS. This survey was implemented by phone over the period July 29th until September 16th, 2024. Of the 4,740 crop farmers interviewed in this round of MAPS, a relatively small share of crop farmers - 17 percent of the interviewed crop producers or 825 farmers - cultivated rice in the 2024 dry season (Table 1). The majority of the interviewed paddy farmers reside in the Ayeyarwady (289 farmers) and Bago (138 farmers), reflecting the importance of these regions in paddy production during the dry season period.[3] Both regions combined produced about three-quarters of total paddy output in the dry season of 2021.[4] It is important to note that Round 4 numbers published in this report may differ slightly from previously published notes due to further data cleaning.

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

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

[3] Covering the post- and pre-monsoon period, or winter and summer crops, typically crops that are harvested between February and July.

[4] As reported by the Ministry of Agriculture, Livestock and Irrigation.

Table 1: Sample rice farmers, MAPS

	Crop Farmers	Rice Farmers 2023	2024
Kachin	12	5	1
Kayah	24	13	1
Kayin	108	19	19
Chin	115	0	3
Sagaing	684	109	133
Tanintharyi	131	8	5
Bago	566	111	138
Magway	553	16	28
Mandalay	568	51	44
Mon	171	13	19
Rakhine	127	9	8
Yangon	203	46	67
Shan	591	17	26
Ayeyarwady	776	217	289
Nay Pyi Taw	111	25	44
Total	4,740	659	825

Source: Authors' calculations based on MAPS, round 6.

To assure 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 (MAPSA 2022a). In this research note, we focus in particular on the information that was collected on the biggest rice plot of rice producers in the dry season of 2023 and 2024. 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 825 households, caution is warranted in interpretation and extrapolation to national and state/region-wide rice production as we only collected information on the largest rice plot.

We divide the country into four major agro-ecological zones that are commonly used in Myanmar and present (some of the) results at that level.[5] The average farm size of the interviewed rice farmers was 6.0 acres (Table 2). The biggest rice farms are seen in the Delta region (7.1 acres) while farms in the Hills and Mountains agro-ecological zone are substantially smaller (3.0 acres). Nationally, the size of the largest plot was on average 1.2 acres while the median was 1. The large majority of rice plots at the national level during the dry season are situated in the lowlands (97.5 percent).

Table 2: Descriptive statistics of rice farmers, MAPS

		Dry Season 2024				
	Unit	National	Hills	Dry	Delta	Coastal
Total number of rice farmers	Number	825	50	249	494	32
Background rice farm						
Average size rice farm - mean	Acres	6.0	3.0	4.1	7.1	5.0
Size largest plot - mean	Acres	1.2	0.7	1.3	1.2	1.0
Size largest plot - median	Acres	1.0	0.5	1.0	1.0	1.0
Land type largest plot						
Upland	%	2.5	16.5	2.3	1.3	0.0
Lowland	%	97.5	83.5	97.7	98.7	100.0

Source: Authors' calculations based on MAPS, round 6.

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

Incentives for rice cultivation – input and output prices

Input prices for rice farmers have mostly increased over the last two dry seasons, except for chemical fertilizer (Table 3). Chemical fertilizer prices – as measured by the price of urea, the most important fertilizer used by rice farmers – declined by one percent on average (the median by five percent) during the dry season of 2024 compared to a year earlier. These fertilizer price decreases were mostly driven by international price changes, which decreased substantially over the last year. The World Bank shows that Middle East FOB prices decreased from 444 USD/ton in January 2023 to 335 USD/ton in January 2024, a decline of 25 percent.[6] We see a smaller decline in Myanmar due to the depreciation of the MMK over the last year.

Table 3 also presents the prices for plowing one acre of land by a four-wheel tractor. Paddy farmers report that those costs have increased by 59 percent on average. A survey of mechanization service providers at the beginning of the monsoon of 2024 showed that price increases for fuel and repair services, machines, parts, and operators continue to raise the cost of mechanization services (MAPSA 2024b).

Average daily wages of hired labor – widely used by paddy farmers – of men and women increased by 38 and 36 percent respectively. While wages increased substantially in nominal terms, given the high food price inflation in the country, wages stabilized in real terms (MAPSA 2024c).

We see small increases in paddy prices. Table 3 shows that at the national level average prices for paddy increased by 14 percent (the median changed by 12.5 percent).

Table 3: Input and output prices (nominal) in paddy rice cultivation, dry season 2023 and 2024

		Dry Season		% change
	Unit	2023*	2024	
Inputs				
Urea price (kg)	Mean	2,015	2,003	-0.6
	Median	2,000	1,900	-5.0
	Nr. Obs	589	*753*	
Costs plowing 1 acre (4-wheel)	Mean	48,185	76,475	58.7
	Median	45,000	70,000	55.6
	Nr. Obs	402	*427*	
Daily wage man	Mean	8002	11,034	37.9
	Median	8000	10,000	25.0
	Nr. Obs	659	*820*	
Daily wage woman	Mean	6,400	8,680	35.6
	Median	6,000	8,000	33.3
	Nr. Obs	650	*804*	
Output				
Paddy price (kg)	Mean	788	902	14.4
	Median	766	861	12.5
	Nr. Obs	635	764	

Source: Authors' calculations based on MAPS, round 6 and 4.

[6] World Bank Commodities Price Data (The Pink Sheet)

Input use

Table 4 gives an overview of average fertilizer use on the largest rice plot in the last two dry seasons. During the dry season of 2024, rice farmers used 110 kgs of fertilizer per acre on average (Table 4). Given the (small) price decreases of fertilizers, we see an increase in use, of 11 percent on average, in the amounts of chemical fertilizer used between the two seasons. The median was stable at 100 kgs. It is to be noted that fertilizer use is higher during the dry season than during the monsoon – e.g., paddy farmers used 66 kgs per acre on average in the last monsoon (MAPSA 2024d). As paddy production is often done under irrigated conditions in the dry season – and therefore more predictable given less uncertainty with rainfall patterns – returns to fertilizer use is typically more certain during that period and farmers therefore tend to use more.

Table 4: Chemical fertilizer use in paddy cultivation (kgs per acre)

		Dry Season	
	Unit	2023	2024
Urea - kg	Mean	66.1	70.4
Ammonium sulphate - kg	Mean	1.2	1.3
Other fertilizer - kg (compound 15_15_15)	Mean	10.1	20.3
Other fertilizer - kg (other compound combined)	Mean	9.0	9.2
Other fertilizer - kg (T super)	Mean	10.4	7.0
Other fertilizer - kg (Potash)	Mean	2.1	2.1
Other fertilizer - kg (Low quality - aukkone)	Mean	0.3	0.1
Total fertilizer – kg	Mean	99.2	110.2
	Median	100	100.0

Source: Authors' calculations based on MAPS, round 6 and 4.

The MAPS also captures the extent to which rice farmers relied on hired labor, draught animals, and mechanization during the dry seasons of 2023 and 2024 (Table 5). We see few differences over time and most rice farms relied on similar labor arrangements over the two seasons. During the dry season of 2024, only 20 percent of rice farmers relied exclusively on their own family labor and 80 percent used outside help, indicating the importance of outside labor for paddy farms. Compared to the dry season of 2023, the share of rice farmers solely relying on family labor increased by one percentage point.

Rice farmers in Myanmar rely heavily on mechanization for their rice farm activities. Nationally, 94 percent of farmers used a tractor (either 4-, 3- or 2-wheel) for plowing plots and 84 percent combine-harvesters to harvest paddy, higher than in 2023. Most rice farmers relied on mechanization service providers for plowing but it is noteworthy that 34 percent used their own tractor for plowing, a slightly higher percentage than a year earlier. Draught animals have traditionally been very important in rice cultivation but were used only by 22 percent of rice farmers in the dry season.

Table 5: Labor use and mechanization in paddy rice cultivation

		Dry Season	
Use on largest rice plot	Unit	2023	2024
Non-family labor			
Hired	%	68.3	70.0
Exchange	%	3.4	3.4
Both	%	9.5	6.8
No	%	18.7	19.8
Draught animals			
Hired	%	9.3	11.1
Own	%	14.3	9.9
Both	%	0.7	1.4
No	%	75.7	77.7
Tractor for plowing			
Hired	%	58.6	57.5
Own	%	32.3	33.7
Both	%	3.9	2.5
No	%	5.3	6.2
Combine-harvester			
Hired	%	79.9	81.4
Own	%	2.8	2.7
No	%	17.3	15.9

Source: Authors' calculations based on MAPS, round 6 and 4.

Finally, we assess overall (commercial) input expenditures on rice as they might give a good indication of the intensity of input use in rice production.[7] Table 6 shows that input expenditures per acre increased on average by 35 percent during the dry season of 2024 compared to the previous one. Despite the reduction in formal credit from the government and micro-finance institutions, farmers were - on average - able to increase expenditures on their rice. Big increases are especially noted for the smaller farmers, who have significantly higher input expenditures than bigger farms.

Table 6: Monetary input expenditures (MMK/acre) on paddy rice

	Dry Season		
Use on largest rice plot	2023	2024	% change
Mean	460,202	621,875	35.1
Median	450,000	600,000	33.3
By size of farm (mean)			
0-<2 acres	460506	629,416	36.7
2-<5 acres	457528	578,770	26.5
5-<8 acres	477347	499,800	4.7

Source: Authors' calculations based on MAPS, round 6 and 4.

[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 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 farmers asking 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 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.

Natural and other shocks

Climatic shocks generally constitute important risks for agricultural production. When asked about the incidence of natural or other shocks, 35 and 20 percent of the rice farmers indicated that they were negatively impacted by at least one of these shocks in the dry season of 2024 and 2023 respectively, a substantial increase (Table 7). Flooding was a more severe issue this round than last year. Floods negatively impacted six percent of all rice farmers while only two percent were impacted in 2023. There were also a lot of complaints by paddy farmers in 2024 of pests, diseases and weed (17 percent of all rice farmers).

Table 7: Incidence of natural and other shocks

		Dry Season	
	Unit	2023	2024
Crop negatively affected by any shock	% yes	20.4	35.1
If yes, which one?			
Drought	% yes	2.7	2.7
Poor access to irrigation water	% yes	0.9	2.9
Irregular rain	% yes	1.4	4.4
Heavy rains	% yes	2.5	3.7
Floods	% yes	1.7	6.0
Flash floods	% yes	0.1	0.3
Extreme temperature	% yes	0.8	1.3
Pest, diseases, weeds	% yes	10.7	16.8
Damage by animals	% yes	3.6	2.9
Damaged by rats	% yes	1.2	0.7
Storm	% yes	0.7	0.4

Source: Authors' calculations based on MAPS, round 6 and 4.

Rice productivity

Paddy rice yields at the national level averaged 1,796 kgs per acre (the median was 1,858 kgs per acre) or 4.4 tons per hectare for the dry season of 2024 (Table 8), significantly higher than during the monsoon when yields averaged 3.1 tons (MAPSA 2024d). We note increases across the board for all agro-ecological zones. As we only have data on the largest plot and have no good assessment of changes in paddy area cultivated, we shy away from making assessments of rice production at the national level.

Table 8: Paddy rice yields on the largest plot (kgs/acre), dry season 2022 and 2023

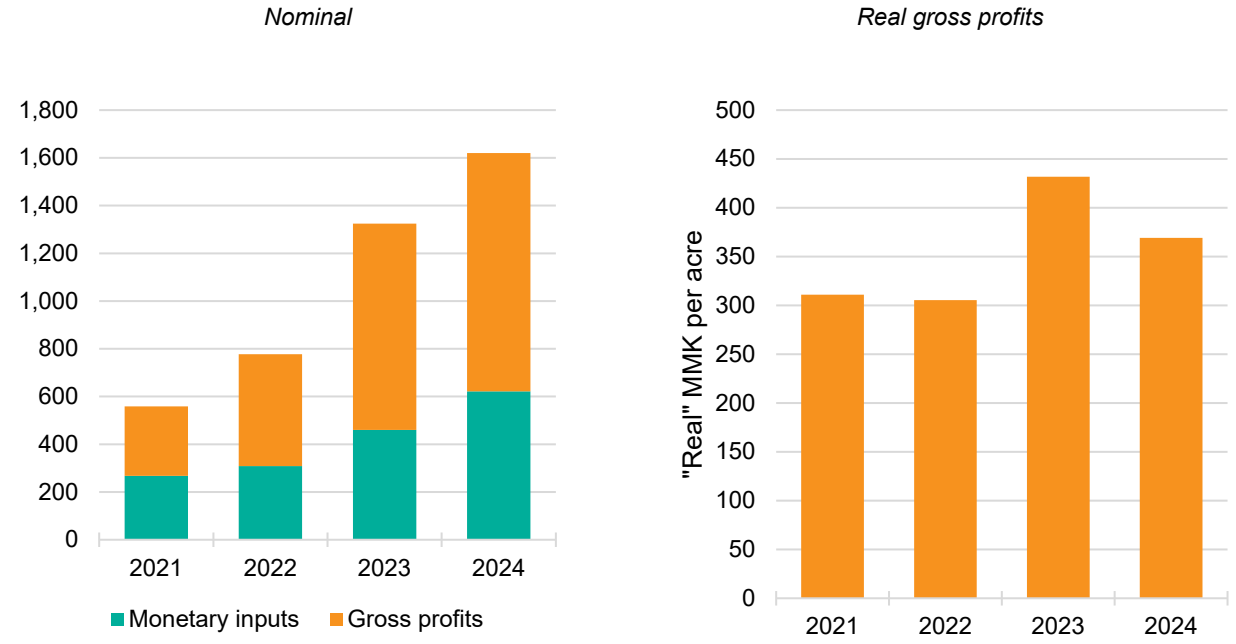
	2023			2024			Mean
	N	Mean	Median	N	Mean	Median	% change
Hills	54	1303	1254	49	1379	1306	+5.9
Dry	200	1621	1672	249	1741	1672	+7.4
Delta	387	1764	1777	494	1876	1929	+6.4
Coastal	17	1479	975	31	1589	1672	+7.4
Total	658	1681	1672	823	1796	1858	+6.9

Source: Authors' calculations based on MAPS, round 6 and 4.

Finally, we assess how gross profits have changed over the last two dry seasons, combining data from average yields, paddy prices, and commercial expenditures per acre over these periods. We see an improvement for gross revenues per acre in the most recent dry season (2024): they increased by 22 percent compared to 2023 (Figure 1). As commercial expenditures increased by 35

percent over the last year, nominal gross profits - reflecting rewards for family farm labor and the use of land - for paddy rice farmers increased by 15 percent from 2023 to 2024. While profits more than doubled in nominal terms compared to two years ago, price inflation has been high in the country (MAPSA 2024c) and real profit did not increase. Instead, real profits, which are nominal prices corrected by the change in the cost of an average food basket (evaluated in the middle of 2021, 2022, 2023, and 2024), from paddy rice farming during the dry season of 2024 declined by 15 percent compared to the dry season of 2023. However, real profits were still 20 and 21 percent higher than in 2022 and 2021 respectively (Figure 1).

Figure 1: Gross nominal revenue and real - in terms of the cost of an average food basket - profits per acre in paddy rice production, dry seasons of 2021, 2022, 2023 and 2024



Source: Authors' calculations based on MAPS, dry season 2024 (round 6), dry season 2023 (round 4), and dry season 2022 (round 2).

References

MAPSA. 2024a. Community and Household Shocks: Findings from the 7th round of the Myanmar Household Welfare Survey (January to June 2024). MAPSA Working Paper 62. Washington, DC: International Food Policy Research Institute.

MAPSA. 2024b. Monitoring the agri-food system in Myanmar: Mechanization Service Providers – July 2024 survey round. IFPRI Myanmar SSP Research Note 112. Washington, DC: International Food Policy Research Institute.

MAPSA. 2024c. Monitoring the agri-food system in Myanmar: The rising costs of diets and declining purchasing power of casual wage laborers: December 2021–June 2024. IFPRI Myanmar SSP Research Note 111. Washington, DC: International Food Policy Research Institute.

MAPSA. 2024d. "Paddy rice productivity and profitability in Myanmar: Assessment of the 2023 monsoon season". MAPSA Working Paper 56. Washington, DC: International Food Policy Research Institute.

MAPSA. 2022a. "Phone surveillance, from scratch. Novel sample design features of the nationally representative Myanmar Household Welfare Survey (MHWS)". MAPSA Discussion Paper 16.

ACKNOWLEGEMENTS

This work was undertaken as part of the Feed the Future Myanmar Agrifood Program for Strategy and Analysis (MAPSA) led by the International Food Policy Research Institute (IFPRI) in partnership with Michigan State University (MSU). This study was made possible by the support of the American people through the United States Agency of International Development (USAID), under the terms of Award No. AID-482-IO-21-000x. This publication has not gone through IFPRI's standard peer-review procedure. The opinions expressed here belong to the authors, and do not necessarily reflect the views of USAID, IFPRI, MSU, or the CGIAR.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
1201 Eye St, NW | Washington, DC 20005 USA
T. +1-202-862-5600 | F. +1-202-862-5606
ifpri@cgiar.org
www.ifpri.org | www.ifpri.info

IFPRI-MYANMAR
IFPRI-Myanmar@cgiar.org
www.myanmar.ifpri.info

The Myanmar Strategy Support Program (Myanmar SSP) is led by the International Food Policy Research Institute (IFPRI) in partnership with Michigan State University (MSU). Funding support for Myanmar SSP is provided by the CGIAR Research Program on Policies, Institutions, and Markets; the Livelihoods and Food Security Fund (LIFT); and the United States Agency for International Development (USAID). This publication has been prepared as an output of Myanmar SSP. It has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and do not necessarily reflect those of IFPRI, MSU, LIFT, USAID, or CGIAR.