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Myanmar Agricultural Performance Survey Round Six

Note on Sample Characteristics and Weighting

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Introduction

The Myanmar Agricultural Performance Survey (MAPS) is a nationally and sub-nationally representative phone survey with the objective of collecting bi-annual data on agricultural indicators including crop production and sales, input use, crop marketing, farm and livestock assets, and farm services. The Myanmar Household Welfare Survey (MHWS) is a nationally and sub-nationally representative phone survey with the objective of collecting bi-annual data on household and individual welfare indicators, including poverty, food security, dietary quality, subjective wellbeing, and coping strategies. MAPS is a sub-sample survey with farming households from MHWS. This note is for the sixth round of MAPS. MAPS Rounds 1, 3, and 5 were conducted between January and March 2022 and 2024 and collect recall data on monsoon production. MAPS Round 2, 4 and 6 were conducted between June and September 2022 and 2024 and collect recall data on dry season production (post/pre-monsoon season).

Phone surveys have several shortcomings including representativeness, enumerator trust, measurement error, and shortened survey length. To help ensure representativeness of our sample we set targets for MHWS data collection from rural, female, lower-educated, and farming households. While there are weaknesses of phone surveys, there are also advantages, particularly in Myanmar. Previous face-to-face socioeconomic surveys in Myanmar failed to reach many townships across the country either due to conflict or remoteness. Round 6 of MAPS includes 259 out of 324 townships (Appendix Table 1).[1]

In this note, we provide details on the data collection and sample characteristics of the sixth-round of MAPS. First, we briefly describe the modules present in MAPS data. Second, we discuss the household sampling design of MHWS and each MAPS round and the differences between the datasets. Third, we discuss the calculation of weights for MAPS and provide descriptives of the weighted sample. Most comparisons throughout the paper are between MAPS round 4 and MAPS round 6 because both surveys were carried out following the post/pre-monsoon season.

MAPS Modules

MAPS Round 6 consists of 15 modules (A-K) that are included in the clean dataset and unique by household ID (hhid). Modules A, B, and J are introductory and closing modules that only include information on the call and confirmation of demographic information. The remaining modules provide data on farmer demographics and agricultural production and marketing.

Module C consists of background and demographic information. This includes data on farmer demographics along with plot sizes and crops grown. Module D provides data on rice production and sales on the largest plot for post/pre-monsoon 2023 and 2024, including rice variety, amounts produced and sold, and farmgate prices. Module E contains similar information to Module D but pertaining to pulses and oilseeds.

Module F consists of data on farm input use including purchased inputs, mechanization, labor, and the effect of natural shocks. Module G presents information on crop marketing and Module H provides data on farm and livestock assets. Module I contains data on farm services including agricultural extension, credit, mobility issues in the community, travel times to access services, contract farming, and crop residues. Module M collects information about the oilseed cultivation program in the community by the local authorities. Module N accesses the roles of agricultural input retailers in terms of access to other services,

[1] Six townships in the Wa Self Administer Division (Wa SAZ) were excluded from this survey due to active sanctions.

extension and credit. Module O consists of data on farmers' trust in agricultural production information from different sources. Module X collects information on resilience and disruptions to farm businesses. Module P includes data on perceptions of climate change.

Data collection and Sample Design of MAPS

MAPS employs CATI (computer-assisted telephone interviewing) to collect representative data across all states and regions of Myanmar. The sixth-round interviews took place between July 2024 and September 2024. The households were selected based on their participation in MHWS and their status as a farming household.

Table 1 shows the timelines for MAPS Rounds 1 to 6. Each Round asks interviewees about the most recent season as well as recall information from the season one year prior. MAPS Round 1 compares agricultural production in monsoon 2020 and monsoon 2021. MAPS Round 2 compares agricultural production between the dry (post/pre-monsoon) season of 2021 and 2022. MAPS Round 3 compares agricultural production in monsoon 2021 and monsoon 2022. MAPS Round 4 compares agricultural production in the post/pre-monsoon 2022 and the post/pre-monsoon 2023. MAPS Round 5 compares agricultural production in monsoon 2022 and monsoon 2023. MAPS Round 6 compares agricultural production in the post/pre-monsoon 2023 and the post/pre-monsoon 2024.

Table 1: MAPS Timeline

Round	Interviews Conducted	Study Period
1	February - March 2022	Monsoon 2020
		Monsoon 2021
2	August - September 2022	Dry (post/pre-monsoon) 2021
		Dry (post/pre-monsoon) 2022
3	January - March 2023	Monsoon 2021
		Monsoon 2022
4	June – July 2023	Dry (post/pre-monsoon) 2022
		Dry (post/pre-monsoon) 2023
5	January – March 2024	Monsoon 2022
		Monsoon 2023
6	July - September 2024	Dry (post/pre-monsoon) 2023
		Dry (post/pre-monsoon) 2024

MAPS and MHWS are conducted in collaboration with Myanmar Survey Research (MSR), a private survey research company based in Myanmar. To obtain a randomized nationally representative sample for

MHWS, a master database was constructed in which all phone numbers were stratified at the township level, so that the amount of phone numbers in each township was proportional to the population size of each township (from the 2014 Census) (DoP, 2015). Then households were selected randomly to be called in each township. We chose to randomly sample at the township level to minimize oversampling of well-connected and/or wealthier townships. Finally, to ensure that women, famers, less educated, and more remote individuals were not under sampled, minimum quotas by state were set for women (half of all respondents), rural location, farming livelihood, and education level.

MAPS Round 1 sampled from the 5,465 farm households in the first round of MHWS and completed interviews with 3,891 respondents (Appendix Table 2). MAPS Round 2 sampled from the farm households in the third round of MHWS and then from the previous round of MAPS until a target of 5,000 respondents was exceeded (Appendix Table 3). MAPS Round 3 began by sampling from MHWS Round 4 farm households, followed by the previous rounds of MAPS until 4,892 respondents were reached. MAPS Round 4 sampled from MHWS Round 5 households followed by respondents from MAPS Round 3, that were not present in MHWS Round 5. The final MAPS Round 4 sample was 5,000 households. MAPS Round 5 sampled from MHWS Round 6 followed by respondents from MAPS Round 4. The total sample is 4,611 farming households. MAPS Round 6 sampled from MHWS Round 7 followed by respondents from the previous round of MAPS until 4,740 respondents were reached.

An overview of MHWS and MAPS Round 6 farm target sample sizes by State/Region can be found in Table 2. Round 7 of MHWS nearly achieved the farm targets overall, but it was short in many states/regions especially in Kayin, Shan, Tanintharyi, and Rakhine. In Kayin, 66 percent of the farm target was reached, while 76 percent was reached in Shan, 83 percent in Tanintharyi, and 89 percent in Rakhine. MSR had the greatest difficulty calling back MHWS Round 7 respondents from Kachin and Kayah. While Kayah had the highest share of MAPS Round 4 respondents at 50 percent of the sample, the sample size was only 24.

Table 2: MHWS Target Sample Sizes Overall and for Famers by State/Region

State/ Region	MHWS Target Farm Sample Size	MHWS Round 7 Farm Sample	MAPS Round 6 Farm Sample	MAPS Round 6 Sample from MHWS Round 7	MAPS Round 6 Sample from Previous MAPS Rounds
Ayeyarwady	723	759	776	678	98
Bago	557	607	566	515	51
Chin	158	155	115	105	10
Kachin	175	173	12	10	2
Kayah	144	136	24	12	12
Kayin	197	129	108	90	18
Magway	506	605	553	513	40
Mandalay	629	611	568	498	70
Mon	204	189	171	145	26
Nay Pyi Taw	86	121	111	106	5
Rakhine	240	213	127	106	21

Sagaing	834	836	684	616	68
Shan	1,057	804	591	487	104
Tanintharyi	166	137	131	112	19
Yangon	238	219	203	173	30
National	5,914	5,694	4,740	4,166	574

Source: Authors' calculations from MAPS data.

The MAPS Round 6 sample has 4,740 combined respondents from MHWS Round 7 and previous MAPS Rounds. This includes 1,003 respondents not previously interviewed for any round of MAPS but interviewed in MHWS. There was a response rate of 51 percent for the households called and 261 households refused to be interviewed. The percentage of the sample coming from each state has changed over the course of the six MAPS Rounds (Table 3). In Round 6, there was a decrease in the proportion of households in Kachin, Shan, Kayah, and Sagaing. These are all regions where there was a large degree of violence during data collection. To make up for small samples in conflict-affected areas, we increased sample sizes in other states/regions in the same agro-ecological zones. As a result, sample sizes increased in Ayeyarwady, Rakhine, Bago, Magway, and Nay Pyi Taw, compared with the previous round.

Table 3: MAPS Round 1, Round 2, Round 3, Round 4, Round 5 and Round 6 Response Numbers

State/ Region	Round 1 Farmers	Round 1 Percent of Sample (%)	Round 4 Farmers	Round 4 Percent of Sample (%)	Round 5 Farmers	Round 5 Percent of Sample (%)	Round 6 Farmers	Round 6 Percent of Sample (%)
Ayeyarwady	472	12	643	13	636	14	776	16 ***
Bago	432	11	509	10	481	10	566	12 **
Chin	47	1	117	2	132	3	115	2
Kachin	108	3	157	3	148	3	12	0 ***
Kayah	45	1	105	2	39	1 ***	24	1 **
Kayin	116	3	122	2 *	107	2	108	2
Magway	422	11	488	10	475	10	553	12 **
Mandalay	496	13	539	11	563	12 **	568	12
Mon	123	3	143	3 **	141	3	171	4
Nay Pyi Taw	79	2	81	2	82	2	111	2 *
Rakhine	158	4	242	5 **	68	1 ***	127	3 ***
Sagaing	616	16	744	15	750	16 *	684	14 **
Shan	550	14	824	16	684	15 **	591	12 ***
Tanintharyi	77	2	131	3	136	3	131	3
Yangon	150	4	155	3 ***	169	4	203	4
National	3891	100	5,000	100	4611	100	4740	100

Source: Authors' calculations from MAPS data.

Table 4 presents the number of households retained in the MAPS panel. Because MAPS samples first from the most recent MHWS round and then from MAPS, panel retention is not the inherent focus. Thus, the retention rate from MAPS Round 5 was only 24 percent (Table 4). Kachin, an area with high conflict, had the lowest retention rate of 2 percent, followed by 5 percent and 6 percent in Rakhine and Kayah, which are also highly conflict-affected areas. Magway and Nay Pyi Taw had the highest retention rate of

36 percent and 34 percent, respectively. Though this was much lower than in the previous rounds. A total of 632 households have remained in every round of MAPS and 1,081 households from Round 1 were present in Round 6 (Appendix Table 3). Magway has the highest number of retention households in the full MAPS panel with 114. Kayah had by far the lowest panel with only one household remaining in every round of MAPS. Because MAPS starts by sampling the most recent MHWS round instead of the most recent MAPS round, it sacrifices panel retention to ensure effective comparisons with the variables in MHWS.

Table 4: MAPS Panel Retention

State/Region	Panel Respondents (Round 1 – Round 6)	Panel Respondents (Round 5, Round 6)	Percent Retained from Round 1 (%)	Percent Retained from Round 5 (%)
Ayeyarwady	101	467	7	33
Bago	86	343	7	29
Chin	4	60	1	20
Kachin	3	6	1	2
Kayah	1	12	0	6
Kayin	8	52	2	15
Magway	114	356	11	36
Mandalay	90	357	8	30
Mon	4	85	1	22
Nay Pyi Taw	22	64	12	34
Rakhine	7	25	1	5
Sagaing	95	413	6	24
Shan	57	316	3	18
Tanintharyi	12	81	4	25
Yangon	28	109	6	24
National	632	2746	6	24

Source: Authors' calculations from MAPS data.

Figure 1 is a map of respondents in MAPS Round 6 by state/region. Sixty-five of the 324 Myanmar townships do not appear in the MAPS Round 6 (20.1 percent of townships) (not including 6 WA SAZ townships). Out of the 65 townships not enumerated, 25 townships were not enumerated in any MAPS Round (Appendix Table 4). Six of these are remote townships in Kachin that are home to very few people. Hpruso in Kayah was not enumerated because of its low population. Another three of these townships are in Shan and were not enumerated because of low population and conflict. The remaining townships not enumerated roundly are Mayangone, Insein and Dawbon in Yangon, due to low population.

Many other townships were not enumerated because of conflict (Figure 2). The MAPS Round 6 sample did not retain 23 townships that were present in Round 5. This was due to electricity blackouts, cell-phone networks down, active conflict, and low enumeration in MHWS. Hpasawng, Mese, and Shadaw are in Kayah; the former two have very low populations, and all three experienced large increases in violence since the end of Round 4. Eight townships in Kachin (Bamo, Chipwi, Hpakant, Mansi, Momauk, Puta-O, Tanai and Waingmaw) were not reachable in Round 6 due to phone connectivity cutoffs and ongoing conflict. At the same time, Mogoke from Mandalay and Kani, Katha, and Nanun from Sagaing also could not be reached. Hseni, Mabein, Namhkan, Namhsan, Namtu, Tangyan and Longkho are in Shan State and experienced a large increase in violence compared to the prior period and also could not be reached.

Figure 1: Interviews Conducted in the Sixth Round of MAPS, by Township

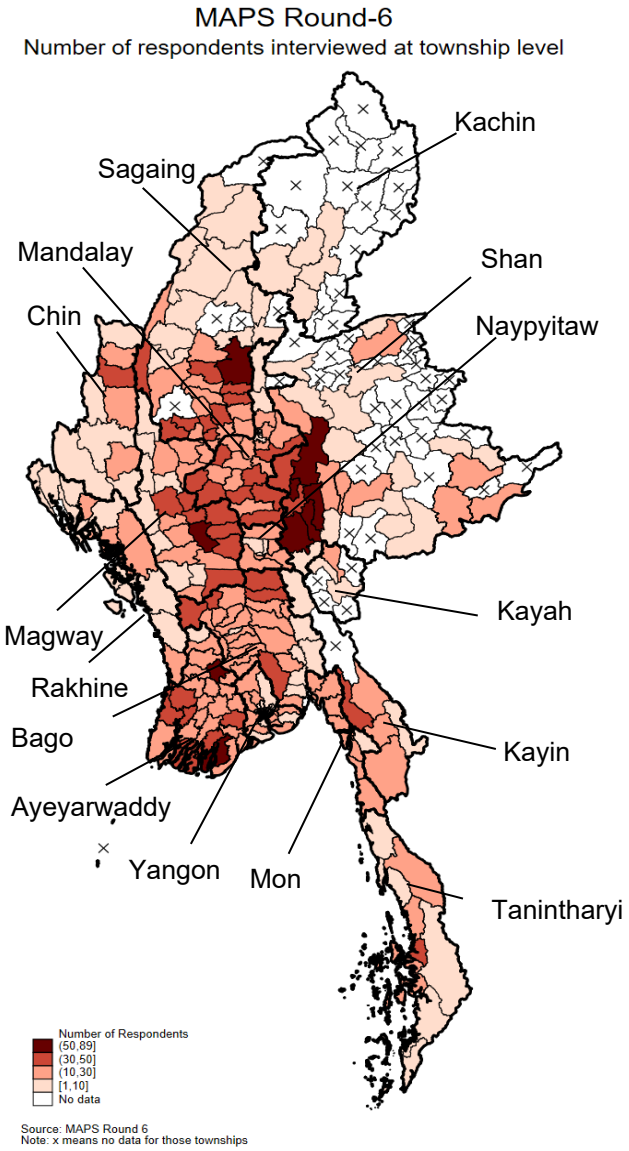
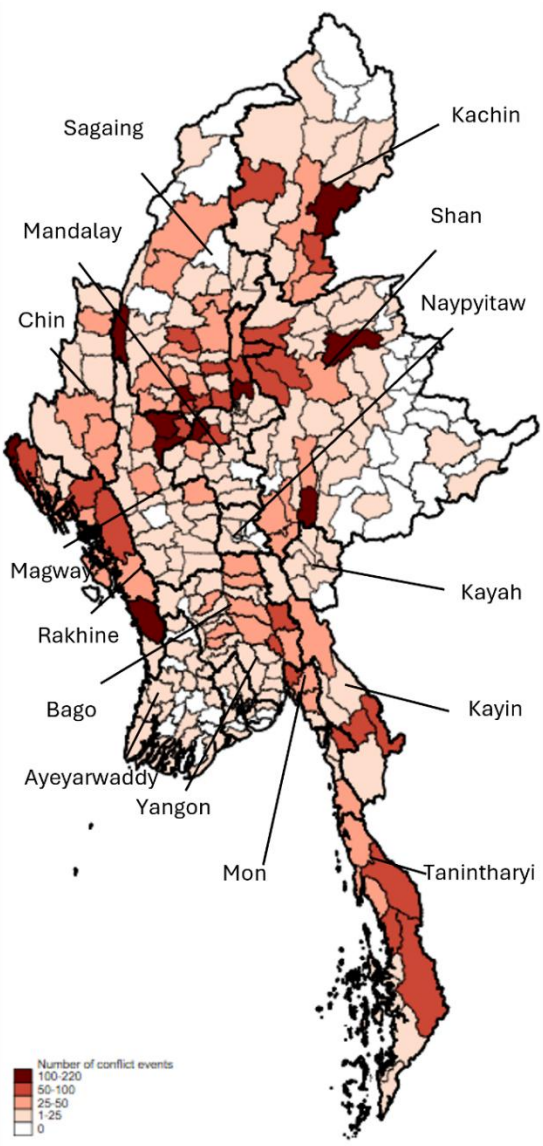


Figure 2: All ACLED Events During the Sixth Round of MAPS, by Township



Sample Weights

To ensure that the sample is representative of farmers at the national and agro-ecological zone level we developed farm-level weights.[2] First, farm households were adjusted for oversampling in each state/region by ensuring that the percentage of farm households was equivalent to the percentage of farm households found in MLCS (CSO 2017). Second, to adjust for oversampling of more educated respondents, households were reweighted based on the share of adults with low education in each state/region in MLCS. Finally, to minimize selection bias of wealthier households, we used the maximum entropy approach and added constraints for agricultural land owned.

[2] In this round, we changed our weighting strategy to be representative at the agro-ecological zone level instead of at the state/region level. This is because we had very limited sample in Kachin and Kayah. While most of our weighting strategy remained identical, we did not add the final extra step of ensuring that the percentage of farmers in each state region was identical to the portion in MLCS. Instead, we required these percentages to be identical by agro-ecological zone.

Table 5 shows the difference in the national dispersion of farming households between MLCS 2017, MHWS Round 7, MAPS Round 4, and MAPS Round 6 after weighting. The distribution across most states and regions remained relatively consistent from Round 4 to Round 6, particularly in Magway, Mandalay, Rakhine, and Tanintharyi. However, notable shifts were observed in several areas — Shan and Sagaing increased significantly, while Chin, Kachin, Kayah, and Nay Pyi Taw declined sharply, dropping to nearly zero percent by Round 6. These changes were largely a result of the new weighting strategy.

Table 5: Dispersion of National Farming Households

State/Region	MLCS 2017 Farming Households (%)	MHWS Round 7 Farming Households (%)	MAPS Round 4 Farming Households (%)	MAPS Round 6 Farming Households (%)
Ayeyarwady	14	14	14	17 ***
Bago	11	11	11	9 **
Chin	1	1	1	0 ***
Kachin	3	3	3	0 ***
Kayah	1	1	1	0 ***
Kayin	3	3	3	1 ***
Magway	9	9	9	9
Mandalay	11	11	11	10
Mon	3	3	3	4 **
Nay Pyi Taw	2	2	1	0 ***
Rakhine	6	6	6	5
Sagaing	14	14	14	16 ***
Shan	19	16	19	25 ***
Tanintharyi	2	2	2	2
Yangon	3	3	3	1 ***

Note: Asterisks show significance between Round 4 and Round 6 at p-values * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations from MAPS data.

Table 6 highlights the differences between the MAPS Round 4 sample and the MAPS Round 6 sample after weighting. The percentage of rural households in the sample is consistent from Round 4 to Round 6.The percentage of female respondents in the sample is identical between Round 4 and Round 6 other than in Kayin and Sagaing, where there were significantly fewer female farm managers. The sample age changed significantly between Round 4 and Round 6, but it is possible that this is because the data was collected a year later. This age gap occurred in Bago, Sagaing, Shan, and Tanintharyi which all have significantly older farmers than in Round 4.

Table 6: MAPS Rural/Urban, Female, and Age Demographic Makeup

State/Region	MAPS Round 4 Rural (%)	MAPS Round 6 Rural (%)	MAPS Round 4 Female (%)	MAPS Round 6 Female (%)	MAPS Round 4 Age	MAPS Round 6 Age
Ayeyarwady	96	97	16	18	47.9	48.5
Bago	95	94	18	17	48.4	49.9 *
Chin	82	78	29	23	46.7	46.9
Kachin	79	66	23	39	45.9	48.8
Kayah	79	69	23	19	46.0	49.1
Kayin	94	95	25	15*	48.3	48.5
Magway	96	97	24	22	47.4	48.5
Mandalay	94	94	21	22	49.8	49.3
Mon	91	90	25	26	50.4	51.3
Nay Pyi Taw	90	89	26	28	49.0	50.5
Rakhine	97	90	21	15	47.4	49.6
Sagaing	94	91	23	15 ***	46.0	47.9 **
Shan	93	90	27	27	44.1	46.0 **
Tanintharyi	89	94	33	22	45.6	51.4 ***
Yangon	86	88	22	17	49.7	47.7
National	93	93	22	21	47.1	48.2 ***

Note: Asterisks show significance at p-values * p < 0.10, ** p < 0.05, *** p < 0.01.

Source: Authors' calculations from MAPS data.

Table 7 compares the unweighted and weighted sample for households with low-educated adults in MAPS Round 4 and MAPS Round 6. In the unweighted sample, the percentage of lower educated farmers is 49 percent in Round 4 and 39 percent in Round 6. This is an underestimate of low-education households due to the difficulties of sampling this group. After weighting, low education rises to 68 percent of households in both Rounds 4 and 6. The percentage of low-education between the two rounds are significantly different in Chin, Mon, and Magway after weighting, with a much smaller percentage of less-educated households in Chin, compared with a much larger number in Mon and Magway.

Table 7: Percent of Low-educated and Farming Households, Unweighted and Weighted, MAPS Round 4 & Round 6

	Unweighted		Weighted	
State/ Region	MAPS Round 4 Percent Lower-Educated (%)	MAPS Round 6 Percent Lower-Educated (%)	MAPS Round 4 Percent Lower-Educated (%)	MAPS Round 6 Percent Lower-Educated (%)
Ayeyarwady	50	38 ***	67	67
Bago	45	36 ***	67	67
Chin	26	8 ***	65	19 ***
Kachin	44	25	61	37
Kayah	42	33	60	50
Kayin	56	39 **	76	67
Magway	54	48 *	64	69 *
Mandalay	53	42 ***	60	59
Mon	46	41	68	79 **
Nay Pyi Taw	42	33	61	57

Rakhine	43	23 ***	70	65
Sagaing	48	41 ***	65	63
Shan	56	47 ***	77	77
Tanintharyi	38	28 *	67	66
Yangon	43	35	61	59
National	49	39 ***	68	68

Note: Asterisks show significance at p-values * p < 0.10, ** p < 0.05, *** p < 0.01.

Note: Statistical comparison is between weighted values.

Source: Authors' estimates from MHWS and MAPS.

Table 8 shows the difference in the amount of agricultural land owned between MAPS Round 4 and MAPS Round 6 respondents, before and after weighting. In Rounds 4 and 6, MAPS oversamples households with more than 7.5 acres and under samples landless households. In Round 6, the weighting process brings down the number of large farms 7 percentage points and brings up the number of landless farmers by 9 percentage points. Before weighting, there are slight variations in the ownership distribution between the Rounds, but after weighting there are no statistical differences.

Table 8: Difference in Owned Agricultural Land between MAPS Round 4 and Round 6 Respondents

Agricultural Acreage	MAPS Round 4 Unweighted (%)	MAPS Round 6 Unweighted (%)	MAPS Round 4 Weighted (%)	MAPS Round 6 Weighted (%)
0 Acres	6	5 ***	14	14
0 to 2 Acres	23	22	22	22
2 to 4 Acres	19	18	19	19
4 to 7.5 Acres	22	23	20	20
More than 7.5 Acres	31	32 *	25	25

Source: Authors.

Note: Asterisks show significance at p-values * p < 0.10, ** p < 0.05, *** p < 0.01.

Note: Statistical comparison is between weighted values.

Table 9 shows the average area cultivated by farmers and the percentage of farmers growing major crops during Round 4 and Round 6 after weighting. Farmers cultivated less land in Round 6 with an average of 4.64 acres in Round 4 and 4.52 acres in Round 6.

In Round 6, significantly less households grew green gram, fruits, and other trees compared to Round 4 because of the sample area change in Round 6 while more farmers grew rice, maize, sesame, pigeon pea, black gram, other grains, other pulses and oilseeds, vegetables, and spices. The percentage of farmers growing groundnut, betel leaves, tubers/roots, nuts, ornamental flowers and other crops across the two post/pre-monsoon seasons remain unchanged.

Table 9: Descriptive Crop Farmers, MAPS

	Unit	MAPS Round 4	MAPS Round 6
Total number of farmers	Number	5,000	4,740
Area cultivated - acres	Mean	4.64	4.52
Crops grown			
Rice (%)	% of farmers	13%	14% *

Maize (%)	% of farmers	1%	2% *
Groundnut (%)	% of farmers	4%	5%
Sesame (%)	% of farmers	5%	6% **
Green gram (%)	% of farmers	8%	6% ***
Pigeon pea (%)	% of farmers	2%	4% ***
Betel leaves (%)	% of farmers	5%	4%
Black gram (%)	% of farmers	7%	9% ***
Other Grains (%)	% of farmers	2%	4% ***
Other Pulse/ Oilseeds (%)	% of farmers	8%	11% ***
Tubers/ Roots (%)	% of farmers	1%	1%
Fruits (%)	% of farmers	11%	9% ***
Nuts (%)	% of farmers	1%	0%
Other Trees (%)	% of farmers	10%	8% **
Vegetables (%)	% of farmers	17%	21% ***
Ornamental Flowers (%)	% of farmers	1%	2%
Spices (%)	% of farmers	4%	6% ***
Other Crops (%)	% of farmers	0%	0%

Source: Authors' calculations based on MAPS. Comparisons are with Round 6.

Note: Asterisks show significance at p-values * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Conclusion

MAPS is a socioeconomic phone survey with the aim of being representative for farmers at the national and state/regional levels. However, because phone ownership and phone access are not universal, there may be underrepresentation of lower income, less educated, and more remote households. However, MHWS sets targets for each of these underrepresented groups to mitigate this issue as much as possible. MAPS benefits from the targets set by MHWS.

Due to power outages, disruptions to phone service, violence, and non-responses, in Round 6, it was hard to reach some of our previously surveyed townships, especially in Kachin and Kayah. Despite limitations, MAPS is representative at the national and agro-ecological level. MAPS Round 6 retained 24 percent of respondents from MAPS Round 4. Because of a change in weighting strategy, and difficulty surveying conflict-affected areas, MAPS had a significantly different distribution in terms of percent of the sample in each state/region. Nonetheless, the sample was nearly identical in terms of percent rural, age, gender, education level, and land size distribution. . There were some significant differences in the percentage of households growing green gram, fruits, and other trees compared with one year ago, but these differences are small. Further, the percentage of farmers growing groundnut, betel leaves, tubers/roots, nuts, ornamental flowers and other crops remained unchanged. MAPS, by collecting high-frequency data on agricultural indicators is critical for understanding the state of crop production and sales, input use, crop marketing, farm and livestock assets, and farm services across Myanmar.

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APPENDIX

Appendix Table 1: Townships Not Enumerated in MAPS Round 6

State	Township	Population Size	Number of Households	Comments
Kachin	Bhamo	118,313	24,161	Conflict area
Kachin	Chipwi	19,170	3,306	Low Population
Kachin	Hpakant	169,498	36,632	Conflict area
Kachin	Injangyang	1,420	285	Low Population
Kachin	Khaunglanhpu	11,635	1,711	Low Population
Kachin	Machanbaw	8,353	1,719	Low Population
Kachin	Mansi	51,198	10,554	Conflict area
Kachin	Momauk	58,651	12,370	Conflict area
Kachin	Nawngmun	7,025	1,212	Low Population
Kachin	Puta-O	58,643	10,743	Conflict area
Kachin	Sumprabum	2,405	479	Low Population
Kachin	Tanai	48,781	8,528	Conflict area
Kachin	Tsawlaw	6,499	1,073	Low Population
Kachin	Waingmaw	118,747	22,860	Conflict area
Kayah	Hpasawng	22,823	4,733	Low Population
Kayah	Hpruso	28,318	5,910	Low Population
Kayah	Mese	5,608	1,302	Low Population
Kayah	Shadaw	6,550	1,406	Low Population
Kayin	Hpapun	32,719	6,502	Conflict area
Mandalay	Mogoke	156,953	35,247	Conflict area
Rakhine	Rathedaung	109,989	24,341	Conflict area
Sagaing	Kani	131,237	29,223	Conflict area
Sagaing	Katha	160,711	31,961	Conflict area

Sagaing	Nanyun	49,820	7,840	Naga SAZ
Sagaing	Pinlebu	109,289	21,900	Conflict area
Sagaing	Wuntho	69,442	14,205	Conflict area
Shan (East)	Monghpyak	28,235	6,165	Conflict area
Shan (East)	Mongping	65,886	13,299	Conflict area
Shan (East)	Mongyang	102,992	19,404	Conflict area
Shan (East)	Mongyawng	75,413	17,196	Conflict area
Shan (North)	Hopang	59,438	11,216	Wa SAZ
Shan (North)	Hseni	54,190	11,779	Conflict area
Shan (North)	Konkyan	59,565	9,665	Kokang SAZ
Shan (North)	Kunlong	55,355	10,392	Conflict area
Shan (North)	Laukkaing	83,860	15,181	Kokang SAZ
Shan (North)	Mabein	41,213	8,632	Conflict area
Shan (North)	Manton	37,254	7,683	Pa Laung SAZ
Shan (North)	Matman	19,050	3,318	Wa SAZ
Shan (North)	Mongmao	69,364	10,445	Wa SAZ
Shan (North)	Mongyai	56,768	13,328	Conflict area
Shan (North)	Namhkan	104,198	21,417	Conflict area
Shan (North)	Namhsan	66,426	13,685	Pa Laung SAZ
Shan (North)	Namtu	48,460	11,641	Conflict area
Shan (North)	Narphan	114,724	16,474	Wa SAZ
Shan (North)	Pangsang	88,732	16,457	Wa SAZ
Shan (North)	Pangwaun	96,940	13,969	Wa SAZ
Shan (North)	Tangyan	166,461	35,142	Conflict area
Shan (South)	Kyethi	70,623	14,712	Conflict area
Shan (South)	Laihka	47,336	8,790	Conflict area
Shan (South)	Langkho	38,344	9,548	Conflict area
Shan (South)	Mawkmai	32,281	7,194	Conflict area
Shan (South)	Monghsu	68,589	15,867	Conflict area
Yangon	Ahlone	48,612	10,943	Urban area
Yangon	Bahan	78,793	17,426	Urban area
Yangon	Botahtaung	36,661	8,397	Urban area
Yangon	Cocokyun	1,172	351	Low population
Yangon	Dagon	20,417	4,608	Urban area
Yangon	Dagon Myothit (North)	200,629	42,704	Urban area

Yangon	Dagon Myothit (Seik-	159,313	37,905	Urban area
Yangon	Dawbon	72,683	14,409	Urban area
Yangon	Insein	278,986	61,676	Urban area
Yangon	Kamaryut	72,697	16,299	Urban area
Yangon	Kyauktada	25,754	6,120	Urban area
Yangon	Kyeemyindaing	106,702	23,062	Urban area
Yangon	Lanmadaw	36,302	8,599	Urban area
Yangon	Mayangone	179,839	38,807	Urban area
Yangon	Pabedan	31,328	6,563	Urban area
Yangon	Sanchaung	87,228	20,635	Urban area
Yangon	South Okkalapa	153,687	32,725	Urban area
Yangon	Tamwe	156,340	35,360	Urban area
Yangon	Yankin	66,792	14,637	Urban area
Total not enumerated		5,129,429	1,064,028	
Total (nationwide) c		51,144,607	11,162,510	
Share of total not enu-		10.0%	9.5%	

Appendix Table 2: Number of HH Interviewed for MAPS From Each MHWS Round

		MAPS Round 1	MAPS Round 2	MAPS Round 3	MAPS Round 4	MAPS Round 5	MAPS Round 6
MHWS Round	**MHWS**	3,891	365	115		63	
	MHWS		310	103		63	
	MHWS		4,346	256		37	
	MHWS			4.418	306	169	71
	MHWS				4,695	218	58
	MHWS					4,061	445
	MHWS						4,166
	Total	3,891	5,021	4,892	5,001	4,611	4,740

Appendix Table 3: Number of Households Present Across MAPS Rounds

	MAPS Round 1	MAPS Round 2	MAPS Round 3	MAPS Round 4	MAPS Round 5	MAPS Round 6
MAPS Round 1		2,791	1,951	1,547	1,368	1,081

Prior Maps Round	**MAPS Round 2**	3,294	2,595	2,180	1,755
	MAPS Round 3		3,282	2,573	2,143
	MAPS Round 4			2,995	2,555
	MAPS Round 5				2,746
	MAPS Round 6				

Appendix Table 4: Townships Not Enumerated in Any MAPS Round

State	Township
Kachin	Injangyang
Kachin	Khaunglanhpu
Kachin	Machanbaw
Kachin	Nawngmun
Kachin	Sumprabum
Kachin	Tsawlaw
Sagaing	Wuntho
Shan (East)	Monghpyak
Shan (East)	Mongping
Shan (East)	Mongyawng
Shan (North)	Hopang
Shan (North)	Konkyan
Shan (North)	Matman
Shan (North)	Mongmao
Shan (North)	Mongyai
Shan (North)	Narphan
Shan (North)	Pangsang
Shan (North)	Pangwaun
Shan (South)	Kyethi
Shan (South)	Laihka
Shan (South)	Mawkmai
Shan (South)	Monghsu
Yangon	Ahlone
Yangon	Bahan
Yangon	Cocokyun
Yangon	Dagon Myothit (North)
Yangon	Kyauktada
Yangon	Kyeemyindaing
Yangon	Lanmadaw
Yangon	Pabedan
Yangon	Yankin

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