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The Emerging One-stop Shop in Agricultural Value Chains

Agro-input Retailers in Myanmar

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ABSTRACT

With the intensification and modernization of agriculture in Myanmar, farmers are increasingly dependent on purchased agro-inputs—such as seeds, fertilizers, and pesticides—to enhance productivity. These inputs are typically acquired from small and medium-sized agro-input retailers. Despite their growing significance in agrifood value chains, limited research has examined the roles these retailers play. Drawing on large-scale, nationwide surveys of farmers and agro-input retailers in Myanmar, we explore their operations and implications in this context. Key findings include:

1. **There is widespread and increased use of agro-chemicals in Myanmar.** Among dry season crop farmers, pesticides were the most commonly purchased input, reported by 73 percent of respondents, closely followed by fertilizers at 72 percent. While fertilizer usage has remained relatively stable compared to nearly a decade ago (75 percent in 2016), pesticide use has increased significantly—rising by 13 percentage points since 2016.
2. **The expansion of pesticide use is reflected in official data.** In 2017, just over 500 pesticide products were registered; by 2024, this number had increased eightfold. Similarly, pesticide imports in 2023 were five times higher than in 2013.
3. **Many agro-input retailers provide complementary services beyond product sales**, offering services such as credit, agricultural extension advice, mechanization facilitation, transportation, crop buying, and emergency loans. These complementary services integrate them more deeply into agricultural value chains.
4. **Only 12 percent of retailers provided none of the aforementioned complementary services, while 16 percent offered four or more**. Competition is a driver of service provision—retailers located near competitors are more likely to offer extension and credit services.
5. **Retailers in insecure areas are equally engaged in delivering complementary services as those in more secure regions.**
6. **Agro-input retailers are a vital source of credit, with nearly half of the farmers purchasing inputs on credit**—typically at a monthly interest rate of 2 percent. Larger farmers are more likely than smaller ones to access credit through retailers.
7. **Nearly half of the farmers reported receiving agricultural extension advice from their main retailer.** This advice often pertains to retailer-sold products but can also address broader agronomic issues. Larger farmers are more likely to use these services than smaller ones. Given the limited availability of public extension services in Myanmar, agro-input retailers are an important, yet often overlooked, source of agricultural knowledge.
8. **Despite their advisory role, farmers generally trust retailers' advice less than other sources**. Trust in agro-input retailers ranks below that in other farmers, public, and private extension agents, and only above trust in mills. Notably, medium and large farmers exhibit higher relative trust in retailers compared to smaller farmers.

9. **Policy Implications**:
    - The rapid increase in pesticide use by farmers in the country raises a number of health, safety, and environmental concerns, especially in a situation where oversight is limited given insecurity and travel concerns.
    - The decline in public agricultural service delivery, such as extension and credit, in the country also underscores the need for increased attention from stakeholders focused on agricultural productivity and equity.
    - While agro-input retailers play crucial, multifaceted roles, their services are not universally accessible. Over-reliance on private providers may risk marginalizing smaller farmers from critical services like credit.
    - The dependence on retailers for extension advice raises concerns about accessibility and credibility. Low trust in retailer-provided information may hinder behavior change and contribute to product misuse, especially regarding inputs with health and environmental risks like pesticides.
    - Further research is needed to understand the nature and impact of the advice given by private retailers. Complementary policy efforts—such as training, certification programs, and trust-building initiatives—may help enhance service quality and farmer confidence.

1. INTRODUCTION

Food systems and agricultural value chains (AVCs) are rapidly transforming in low- and middle-income countries, driven by improved infrastructure, population and income growth, urbanization, policy reform, and technological advancements (Barrett et al., 2022). There have been significant increases in global agricultural production, driven not only by land expansion but also by productivity growth largely attributable to widespread adoption of improved seeds, chemical fertilizers, and other agrochemicals.[1]

Within this transformation, there has been widespread expansion of agro-input retailers in LMICs and an increasing farmer reliance on purchased agro-inputs. Yet, despite their growing importance, the role of agro-input retailers in agricultural value chains is not well understood in Myanmar. The purpose of the analysis is threefold. First, we evaluate the additional services that agro-input retailers provide in AVCs beyond agro-input sales. Second, we assess the inclusivity in the delivery of these complementary services. Third, we evaluate the trustworthiness of agro-input retailers in delivering one of their key complementary services: agricultural extension advice.

For this study, we draw on two large-scale primary surveys in Myanmar. We surveyed almost 5,000 farmers as well as 171 input retailers in 2024 and collected data on the provision of these complementary services on top of agro-input sales. We use both of these datasets for an observational study and provide a broad descriptive overview of complementary service delivery by agro-input retailers.

The paper is set up as follows. In section 2, we present background information on the agricultural sector in Myanmar. Section 3 discusses the data and methodology. Agro-input retailing in Myanmar is described in Section 4. Agricultural service provision beyond agro-input sales is explored in more detail in Section 5 while trustworthiness of agricultural extension advice by agro-input retailers is looked at in Section 6. We conclude in Section 7.

2. BACKGROUND

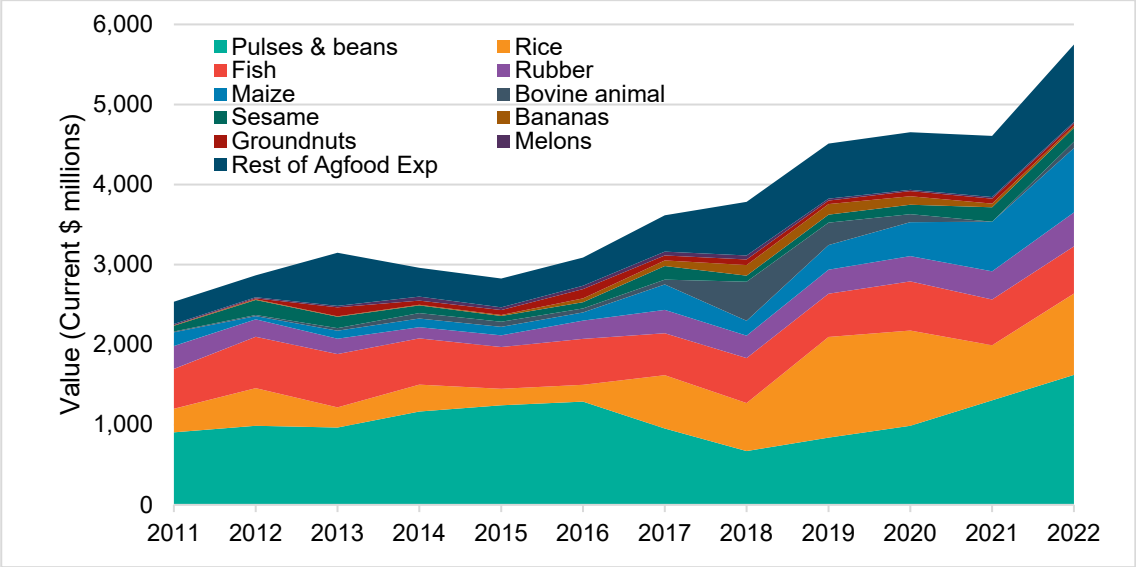
Fertilizer and seed markets have been the focus of much agricultural economics research, often due to their central role in the Green Revolution (Jayne et al., 2003) but other agro-chemical input markets have also seen rapid growth. For instance, investments in herbicides have surged globally due to the availability of cheap generic products and rising costs of weeding labor (Haggblade et al., 2017). Pesticide use has also dramatically increased (Shattuck et al., 2023; Bernhardt et al., 2017), with global imports of formulated pesticides nearly doubling between 2005 and 2019, with especially large growth in LMICs (Shattuck et al., 2023). The correct use and application of these agro-inputs are often more complex than fertilizers, requiring specific knowledge on dosage, timing, and safe handling. The widespread presence of fraudulent products (Haggblade et al., 2022) further exacerbates these challenges, increasing risks of misuse and making it harder for farmers to learn correct application practices. The increasing use of agro-chemicals in transforming agricultural economies in LMICs has made agriculture more input-intensive but also knowledge- and capital-intensive, often requiring complementary services.

Since the gradual liberalization of Myanmar's economy beginning in the 2010s, Myanmar's agrifood system has experienced significant transformation (Boughton et al., 2024). Agricultural exports have seen substantial growth over the last decade. Figure 1 illustrates the aggregated export value of the top agrifood commodities between 2011 and 2022. Pulses and beans have consistently

[1] However, this productivity growth is not uniform across all regions, as access to and effective use of modern agro-inputs remain significant challenges in many LMIC (Otsuka and Fan, 2021).

been the major export group for Myanmar, accounting for $1.6 billion in exports in 2022, showing a slight increase compared to the early 2010s. Other agricultural commodities have experienced particularly high growth. Rice export quantities quadrupled between 2011 and 2020, making Myanmar the fifth-largest rice exporter in the world, driven by rapid modernization in the sector (MAPSA, 2024a). The maize sector has similarly undergone significant changes, becoming Myanmar's third-largest export commodity in 2022, up from a very low base a decade earlier (MAPSA, 2023).

Figure 1. Value of exports of top agrifood commodities from Myanmar, by commodity, 2011-2022

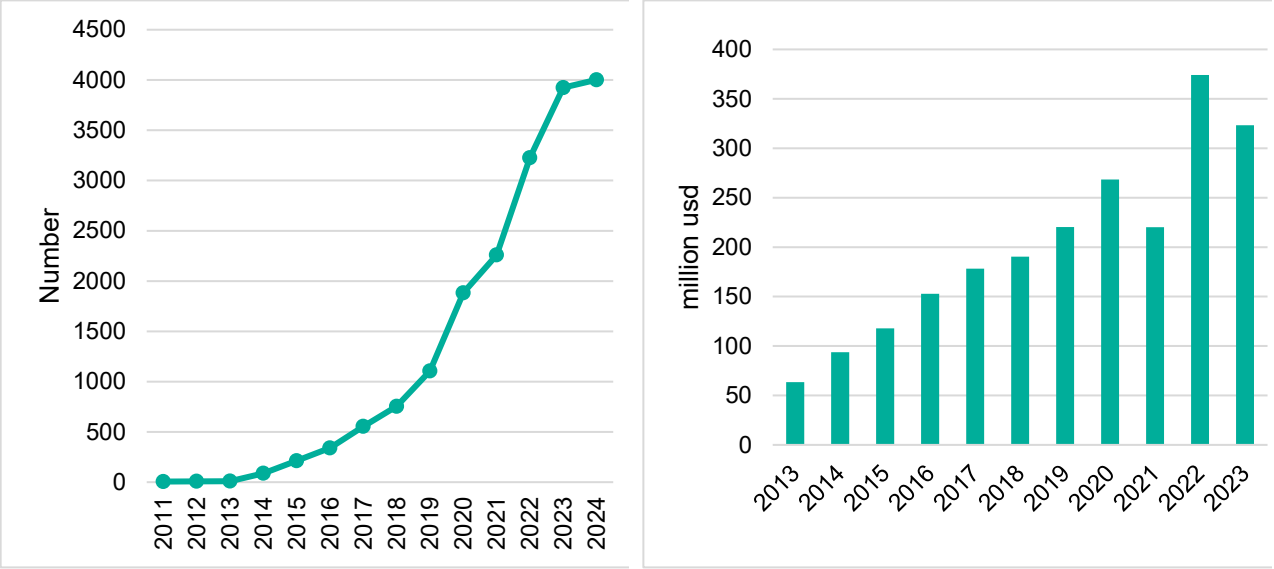


Source: BACI (2024)

Part of this improved agricultural performance and export growth can be attributed to increasing farm commercialization, which is closely linked to the growing use of commercial agro-inputs, such as seeds and agro-chemicals. Minten et al. (2024a) found, based on a national household survey conducted in 2016, that farmers spent an average of $380 per farm annually on commercial agro-inputs, representing 20 percent of the value of crop production and 26 percent of crop sales. The study also revealed that fertilizers were the largest agricultural input purchase for Myanmar farmers, accounting for 28 percent of all purchases. Machine rental accounted for the largest share of non-fertilizer expenses at 20 percent, followed by agro-chemicals (pesticides, 14 percent), and seeds (14 percent).

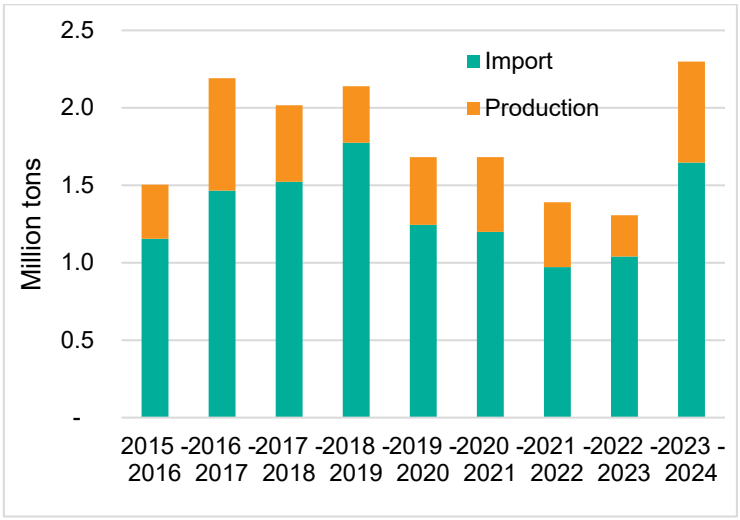
Since that survey, which was almost a decade ago, pesticide use in Myanmar has increased significantly (Figure 2). The number of approved pesticides was just over 500 in 2017, but increased eightfold by 2024. Similarly, the quantity of imported pesticides has also experienced high growth rates, with imports in 2023 being five times higher than in 2013 (in USD nominal terms). Using a national farm survey and recall data, Minten et al. (2024b) confirm large changes in pesticide use, as the share of farmers using herbicides increased by 38 percentage points over a 10-year period. In contrast, fertilizer use was mostly stable, but has declined slightly in the last four years (Figure 3), driven by high international prices and conflict in the country (Takeshima et al., 2025).

Figure 2. Growth in pesticide imports and registration in Myanmar



Source: Comtrade and MOALI (Plant Protection Division, DOA)

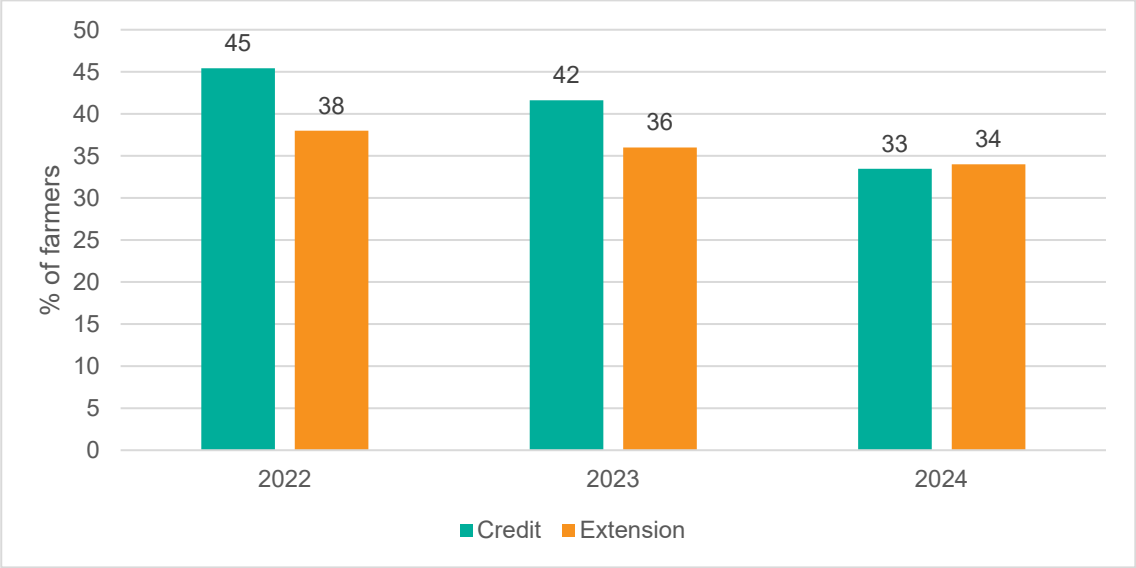
Figure 3. Fertilizer use in Myanmar



Note: 2021/22 to 2023/24 reflects a different fiscal year.
Source: Central Statistical Organization

While the agricultural sector has undergone rapid transformation in the last decade, agricultural service delivery – especially credit and extension – remains a significant challenge in Myanmar. By the end of the 2010s, agricultural extension agents were covering an average of 4,135 farmers per agent, more than double the number in Vietnam and considerably higher than the ratio of 2,600 farmers per extension agent in Thailand (Ekanayake et al., 2019). The Myanmar Agricultural Development Bank (MADB) was the main source of formal credit. However, restrictions on eligibility—such as the requirement for land titles—have limited farmer access to credit across the country (Luna-Martinez and Anantavrasilpa, 2014; Aung et al., 2019). Agriculture service delivery worsened significantly after the military coup in early 2021, as violence and political instability reduced farmer access to formal credit and extension. By 2024, the share of farmers using these services had declined by 12 and 5 percentage points, respectively (Figure 4).

Figure 4. Use of agricultural farm services by farmers in Myanmar



Source: Authors' calculations based on the Myanmar Agricultural Performance Surveys

3. DATA AND METHODOLOGY

For our analysis we rely on two primary datasets. First, we use data from an August 2024 agro-input retailer telephone survey that we conducted with 171 retailers across 7 of Myanmar's 15 states and regions. It is to be noted that the sample is not fully representative of the country as whole. The survey collected data on the background of the retailer; sales quantities and prices of key inputs such as fertilizers, seeds, and pesticides; credit use; additional services provided by the agro-input retailer; and the prevalence and impact of shocks on business operations.

Second, the farm data comes from the Myanmar Agriculture Performance Survey (MAPS), a phone survey conducted with 4,740 crop farmers across all states and regions of the country during the third quarter of 2024 (from July 29 to September 16), following the dry season. This survey gathered information on household characteristics; total cultivated area; crops grown; agro-input use; farm management practices; yields; marketing behavior; security perceptions; and use of services provided by agro-input retailers. To ensure that the crop farmers surveyed are representative of the broader crop farming population in their respective states or regions, a weighting factor was applied, based on a methodology explained in Lambrecht et al. (2023).

We use both datasets to provide a broad descriptive overview of complementary service delivery by agro-input retailers. To analyze inclusivity, we compare service use rates across three categories of farmers, from small to large, as well as conduct regression analysis where we include other, potentially important associates.

To assess the trust farmers have in agricultural extension advice provided by agro-input retailers relative to other information sources, we implemented a best-worst scaling (BWS) experiment. In the experiment, we examined five sources of information—input retailers, private extension agents, public extension agents, other farmers, and millers. We utilized a balanced incomplete blocked design that simplified the data collection scenarios and improved statistical efficiency, ensuring that each alternative was seen the same number of times and was compared to other scenarios equally. The design included 10 total scenarios with 3 alternatives in each scenario. Among the alternatives, farmers were asked which source of information they trusted the most, and the least (see Appendix A1 for an example choice occasion). We conducted this experiment over the phone, and we made several decisions to make it less burdensome for farmers. Each scenario included only 3

alternatives, and we split the design into two blocks to avoid overwhelming respondents with repetitive questions. Additionally, we administered the BWS experiment only to the sub-sample of farmers that did not grow dry season crops, and who were not required to complete the detailed modules on dry season production.

We analyze the BWS choices in two ways: descriptive best-worst scores, and conditional logit choice models. The best-worst scores for each information source are calculated as the number of times the source was selected as most trusted, minus the number of times it was selected as least trusted, divided by the number of times the source appeared in the choice sets. By construction, best-worst scores are between 1 and -1, where positive values mean the source was selected as most trusted more often than least trusted, and negative values mean the opposite. Best-worst scores provide a simple, concise comparison of relative trust levels across information sources for the full sample, but we are also interested in variations in trust levels across farmer characteristics.

4. AGRO-INPUT RETAILING IN MYANMAR

4.1. Agro-input Retailers

We conducted 171 interviews with agro-input retailers that were actively selling inputs during the 2024 monsoon season. Most of the samples are in either the Delta (47 percent) or Dry Zone (40 percent) agro-ecological zones, with a smaller share in the Hills and Mountains (13 percent) (Table 1). The average age of input retailers interviewed was 42 years, and the majority (71 percent) were male. These retailers were generally well educated, with two-thirds completing at least some post-secondary education. The shops sold an average of 37.7 million MMK[2] in inputs in the month prior to interview, but they had small numbers of employees, 1.8 permanent and 1.6 temporary on average. A majority owned a motorbike for transporting inputs (65 percent) and a much smaller share owned a truck or small vehicle (24 percent). The main products sold were inorganic fertilizers (89 percent), agro-chemicals (78 percent), and seed (54 percent). Much smaller shares sold organic fertilizers (12 percent) or agricultural equipment (1 percent). The retailers' primary source locations for their inputs vary with 34 percent sourcing mostly from within the township they operate, 27 percent from outside the township but in the same state/region, and 39 percent from outside the state/region. A quarter of the sample sold inputs not only to farmers, but also to other agro-input retailers.

[2] Approximately 10,500 USD at the reference exchange rate published by the Central Bank of Myanmar.

Table 1. Agro-input retailer descriptive statistics

Variable	Sample Average
N	171
Age	42.33
Years of experience	12.18
Female	0.29
Input sales value last 30 days ('000,000 MMK)	37.68
N of employees (mean)	
Permanent	1.78
Temporary	1.56
Education level (%)	
Primary	9
Secondary	25
Post-secondary	66
Agro-ecological zone (%)	
Delta	47
Dry zone	40
Hills and mountains	13
Own transport (%)	
Truck or small vehicle	24
Motorbike	65
Selling different product categories (%)	
Inorganic fertilizer	89
Organic fertilizer	12
Seed	54
Agro-chemicals	78
Equipment	1
Main source location for inputs (%)	
Within township	34
Outside township, within state/region	27
Outside state/region	39
Sell to other retailers (%)	25

Source: Authors' calculations based on the Myanmar agro-input retailer survey, 2024

4.2. Farmers

To understand patterns related to farm size, we divide our sample into three groups: farmers who owned less than 3 acres (small farms), between 3 and 7 acres (medium), and more than 7 acres (large) and present descriptives for the overall sample and for these 3 groups (Table 2). The average land area owned by the interviewed farmers was 6 acres, with the areas varying across the three groups from 1.3 acres for the small farms, to 5.2 acres for medium-sized farms, and to 15.6 acres for the largest farms. In 79 percent of the cases, the primary farm management decision maker was male, with an average age of 48 years. Two percent of agricultural decision makers had no formal education, while 62 percent had completed primary school. Education levels were generally higher among those managing larger farms. On average, 1.6 household members worked on the farm.

Although 4,740 farmers were interviewed, only 3,751 (79 percent) of the contacted farmers reported cultivating crops during the dry season of 2024, indicating the lesser importance of this season compared to the monsoon. The majority of the farms surveyed were located in the Dry Zone (36 percent) and the Delta (28 percent). The average travel time to the nearest agro-input retailer was 35 minutes.

Table 2. Farmer descriptive statistics

	Number of observations	National	Small (0-3 acres)	Medium (>3-7 acres)	Large (>7 acres)
Characteristics farmers					
Number of observations	4,740	4,740	1,781	1,412	1,547
Gender main farm management decision maker (1=male)	4,740	79%	74%	82%	85%
Age main farm management decision maker (years)	4,740	48.2	46.3	49.5	50.4
Education level farm management decision maker					
None (%)	4,740	2%	2%	2%	2%
Primary (%)	4,740	62%	66%	61%	57%
Secondary (%)	4,740	32%	29%	34%	36%
Other (%)	4,740	4%	3%	4%	5%
Household size (number)	4,740	4.3	4.2	4.2	4.5
Working hh members (number)	4,740	1.6	1.6	1.7	1.7
Crop area owned (acres)	4,740	6.0	1.3	5.2	15.6
Crop area cultivated in dry season (acres)	3,751	4.5	1.9	4.0	9.9
Location farmers					
Distance to nearest agro-input dealer (minutes)	4,737	35.3	33.7	35.7	37.8
Distance to nearest rice mill/huller (minutes)	4,365	28.6	26.8	27.7	33.0
Distance to nearest township center (minutes)	4,737	48.1	48.2	47.2	49.1
Location by agro-ecological zone (%):					
Hills and mountains	4,740	26%	29%	22%	25%
Dry Zone	4,740	36%	35%	39%	34%
Delta	4,740	28%	25%	29%	32%
Coastal areas	4,740	10%	11%	10%	9%

Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

Farmers cultivating crops in the dry season were asked about the types of agro-inputs they purchased (Table 3). The most commonly purchased agro-inputs were pesticides, reported by 73 percent of farmers, followed closely by fertilizers at 72 percent. While the share of farmers using fertilizer was similar to almost a decade ago (75 percent), there has been a significant increase in the use of pesticides, rising by 13 percentage points from 60 percent in 2016 (Minten et al., 2024b). Half of the farmers reported experiencing a shock that affected their expected agricultural production during the dry season (Table 3). The most frequently reported shocks were pests, diseases, and weeds, cited by 36 percent of respondents, which likely contributes to the high use of pesticides. Herbicides use was asked about separately, and 45 percent applied selective herbicides and 28 percent used glyphosate. Additionally, 49 percent of farmers purchased seeds. Overall, our data indicate a strong reliance on agro-input purchases, with 93 percent of farmers reporting at least one

purchased agro-input for the previous agricultural season. Interestingly, patterns of input use are similar between small and large farms.

Table 3. Use of agro-input markets by farmers during the last dry season

	Number of observations	National	Small (0-3 acres)	Medium (>3-7 acres)	Large (>7 acres)
Use of input markets by farmers in last dry season (for those that cultivated)					
Share that bought:					
- chemical fertilizer	3,705	72%	72%	72%	73%
- seeds	3,703	49%	52%	48%	45%
- pesticides (non-herbicides)	3,703	73%	70%	76%	77%
- glyphosate	3,703	28%	25%	31%	32%
- selective herbicides	3,703	45%	40%	46%	53%
Share of farmers that did not buy any of these inputs	3,705	7%	8%	6%	7%
Natural calamities in last season					
Crop negatively affected by any shock	3,703	50%	46%	53%	52%
If yes, which one?					
Drought	1,894	13%	13%	13%	15%
Poor access to irrigation water	1,894	4%	3%	4%	5%
Irregular rain	1,894	20%	18%	22%	20%
Heavy rains	1,894	21%	22%	18%	22%
Floods	1,894	15%	18%	14%	11%
Flash floods	1,894	1%	1%	1%	1%
Extreme temperature	1,894	5%	6%	3%	4%
Pest, diseases, weeds	1,894	36%	35%	38%	37%
Damage by animals	1,894	2%	2%	2%	4%
Damaged by rats	1,894	1%	1%	1%	2%
Storm	1,894	2%	1%	4%	1%
Others	1,894	1%	1%	1%	3%

Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

We further asked farmers for more details about their interactions with the agro-input retailers over the past year. We find a relatively competitive environment with fifty-two percent of the farmers indicating that they had 'a lot of choice' in agro-input retailers while only 8 percent indicated 'no choice' (Table 4). Farmers often buy their inputs from multiple agro-input retailers. On average, they relied on two for the year, the same level for small and big farmers. We then followed up with specific questions on the agro-input retailer that the farmer most frequently used over the past year. Farmers had on average relied on this agro-input retailer for 6 years and over the past year, they had most frequently bought fertilizers (85 percent) and other agro-chemicals (84 percent) from this retailer. Seeds were less frequently bought, confirming the lower use of markets for seed acquisition by most of these farmers. Interestingly, their main reported reason for buying from that particular retailer was that the farmer had a good relationship with him, and less for price levels or services that he provided. Personal relationships therefore matter in these contexts as they can serve a variety of purposes, as shown in other settings (e.g. Fukuyama, 1995; Fafchamps and Minten, 1999; Michler and Wu, 2020).

Table 4. Farmer engagements with agro-input retailers over the past year

	National	Small (0 – 3 acres)	Medium (>3 – 7 acres)	Large (>7 acres)
Choice in agro-input retailers:				
A lot	52%	50%	55%	55%
A little	39%	42%	39%	36%
No choice	8%	9%	6%	8%
Number of agro-input retailers that farmers relied upon for the purchase of agricultural products in the last 12 months				
Mean	2.0	1.9	1.9	2.1
Median	2.0	2.0	2.0	2.0
For the most commonly used agro-input retailer by the farmer over the last 12 months				
Number of years that farmer has relied on the services of this agro-input retailer				
Mean	5.9	5.3	6.2	6.7
Median	5.0	4.0	5.0	5.0
Products bought from this retailer over the last 12 months:				
- Fertilizer	85%	84%	85%	86%
- Seeds	41%	42%	39%	39%
- Agro-chemicals	84%	81%	85%	86%
- Other	38%	35%	36%	46%
Main reason for the choice of this agro-input retailer				
"There is no other choice in agri-input retailers"	2%	2%	3%	2%
"He has lots of choice in products"	11%	12%	11%	11%
"The price of his products is good"	35%	35%	34%	36%
"The quality of his products is good"	12%	11%	12%	12%
"I am used to buying from him/friend/good social relationship"	49%	45%	52%	53%
"He resides close by"	20%	23%	19%	15%
"He provides credit"	16%	14%	16%	20%
"He provides agricultural extension"	4%	4%	4%	4%
"He provides door-to-door service"	2%	2%	1%	2%
"Recommended by private company agent"	0%	0%	0%	0%

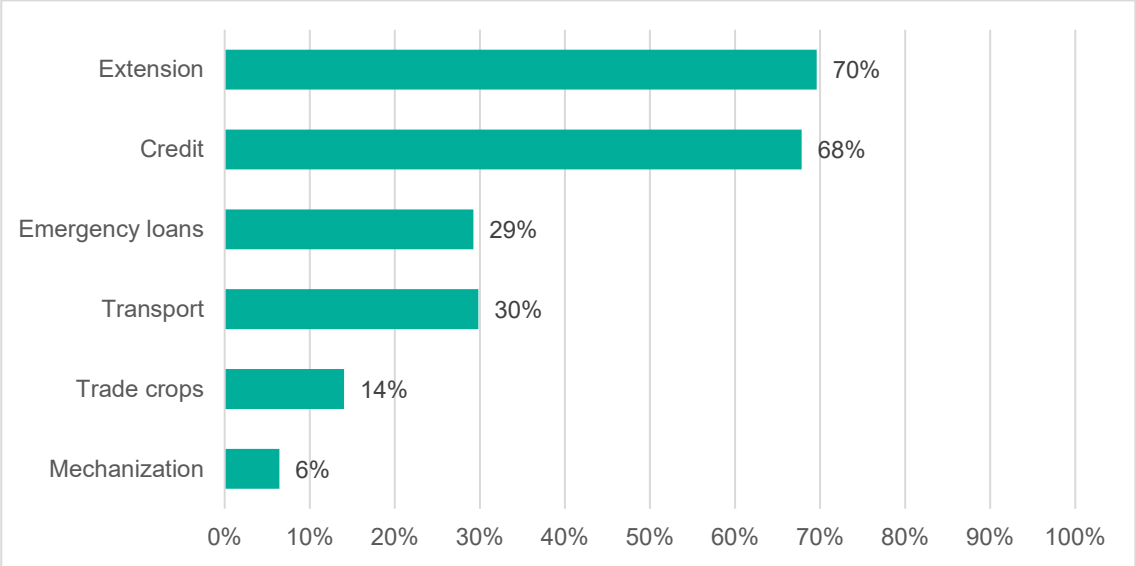
Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

5. COMPLEMENTARY AGRICULTURAL SERVICE DELIVERY BY AGRO-INPUT RETAILERS

5.1. Agro-input Retailers

To understand the multi-faceted roles of input retailers, we asked our sample about a suite of complementary services provided to farmers in the year prior to interview. Results show that these are indeed diversified businesses, delivering additional services to farmers in addition to selling inputs (Figure 5). Majorities of the sample provided extension advice (70 percent) and sold inputs on credit (68 percent). Other notable services provided in 2024 included emergency loans (29 percent), transportation services (30 percent), and crop buying or trading (14 percent), while a small share (6 percent) provided mechanization services (tractor plowing or combine harvesting). The sample provided on average more than two of these complementary services. Just 12 percent provided none of these services and 16 percent provided four or more.

Figure 5. Services provision by input retailers, reported by input retailers



Source: Authors' calculations based on the agro-input retailer survey 2024

5.2. Farmers

On the farm side, we asked farmers what complementary services their most commonly used agro-input retailer provided (Table 5). It also shows at that level significant involvement of the retailer in a number of activities beyond agro-input sales. Ten percent of the farmers reported that agro-input retailers would provide or facilitate access to mechanization rental services while 21 percent would purchase commodities or facilitate access to output markets. Twenty-one percent of the farmers believed that when they would need an emergency loan – e.g. due to sickness or for educational purposes - the agro-input retailer would be willing to provide. These complementary services (access to mechanization services, access to output markets, and providers of emergency loans) are generally less important than credit provision and agricultural extension advice.

Confirming results from the agri-input retailers' data, a substantial number of agro-input retailers provide agro-inputs on credit. Fifty-three percent of the farmers indicated that the agro-input retailer they mostly relied upon would be willing to provide agro-inputs on credit and forty-seven percent of the farmers did purchase agro-inputs on credit over the last 12 months. Given the low use of formal credit (MAPSA, 2024b), credit provision by agro-input retailers is an important complementary service. Farmers reported paying interest rates of about 2 percent per month when borrowing from agro-input retailers. Credit taken for the full season (about 4 months) had a slightly lower interest rate of about 3.5 percent for the period.

Agricultural credit provision by AVC businesses has been a hotly debated issue in the development literature since the seminal insights by e.g. Bardhan (1980) and Bell and Srinivasan (1989). During these earlier periods, tied output-credit markets—where output traders advanced payments to farmers during the cultivation seasons in interlinked transactions to acquire their output under exploitative conditions—were commonly found in poor agricultural settings. More recent surveys in several Asian countries have shown that such interlinked practices have mostly disappeared (Reardon et al. 2014). However, credit demand at the farm level is still high and, in the case of Myanmar, the agro-input sector has partly filled that void.

Table 5. Other services provided by the agro-input retailer, as reported by the farmer

	National	Small (0 – 3 acres)	Medium (>3 – 7 acres)	Large (>7 acres)
Agro-input retailer provides or facilitates access to mechanization rental services				
Provides himself	3%	2%	4%	5%
Facilities access	7%	7%	7%	8%
No	90%	91%	89%	87%
The agro-input retailer purchases himself produce or facilitate access to output traders				
Purchase products himself	11%	9%	10%	16%
Facilities access	10%	9%	10%	11%
No	79%	82%	80%	73%
If farmer needed an emergency loan (for sickness, for education, etc.), agro-input retailer would provide				
Yes	21%	20%	19%	25%
Likely	1%	1%	2%	2%
No	69%	70%	69%	66%
Do not know	9%	9%	10%	7%
The agro-input retailer provides inputs on credit				
Yes	53%	51%	52%	57%
No	41%	42%	42%	38%
Do not know	6%	8%	6%	5%
If he does, at what interest rate?				
Monthly interest rate mean	1.9	1.7	2.1	2.2
Monthly interest rate median	2.0	0.0	2.0	3.0
Seasonal interest rate mean	3.5	3.2	4.2	3.2
Seasonal interest rate median	3.4	3.0	3.0	3.0
The farmer purchased agro-inputs on credit in the last 12 months	47%	46%	43%	51%

Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

Almost half (47 percent) of the farmers also indicated that agro-input retailers provided agricultural extension advice (Table 6). Access to agro-input retailer extension advice is strongly associated with farm size, as large farmers were 11 percentage points more likely than small farmers to report access. Among the retailers offering advice, 28 percent did so through agents – sometimes affiliated with larger agro-input companies. Again, farm size matters as larger farmers were more likely to report that their primary retailer used agents to provide extension services.

One-third of the farmers indicated that they had received agricultural extension advice over the last 12 months. Different outreach methods were used but much of the advice was given in-person at the shop. However, in 38 percent of cases when advice was given agro-input retailers visited the farm. It is noteworthy that bigger farmers relied substantially less on advice at the shop than small farms and more on advice that was delivered at the farm itself. Advice on the phone was also more often done for bigger farmers, confirming similar results seen in agricultural extension advice by other means (MAPSA, 2024c). This agricultural extension advice obviously concerned the products that the agro-input retailer was selling. However, advice was often also beyond that type of information as almost 60 percent of the farmers that received advice indicated that agro-input use and agronomic advice was received beyond the product that the retailer sold. Almost one-third of these farmers also reported that they received marketing advice.

While the descriptive results in the provision of services show mostly a substantial relation with the size of the farm, this could be partly linked to other characteristics of the farmer. We therefore run a regression with service delivery in a number of domains as dependent variable on the size of the farm and a number of other potentially important associates. The results are presented in Appendix 2. They mostly confirm the strong positive linkages between farm size and the provision of complementary agricultural services.

Table 6. Agricultural extension advice by agro-input retailers, as reported by farmers

	National	Small (0 – 3 acres)	Medium (>3 – 7 acres)	Large (>7 acres)
The agro-input retailer or his agents provide any extension advice				
Yes	47%	43%	48%	54%
No	52%	56%	52%	46%
If yes, private company agents, linked to this agro-input retailer, provided extension				
Yes	28%	22%	29%	37%
No	68%	72%	66%	61%
Do not know	5%	6%	4%	3%
Farmer used extension advice from this agro-input retailer over the last 12 month	34%	30%	34%	41%
If yes, manner in which this advice was received				
- In-person at the shop of the retailer	81%	86%	78%	78%
- By phone	24%	17%	29%	31%
- He or his agent	38%	29%	42%	48%
Type of advice the retailer or his agents provided to the farmer over the last 12 months				
- Agro-input use, concerning products he sells	95%	94%	96%	96%
- Input use and agronomic advice, beyond products he sells	58%	54%	61%	61%
- Marketing advice	29%	29%	31%	26%

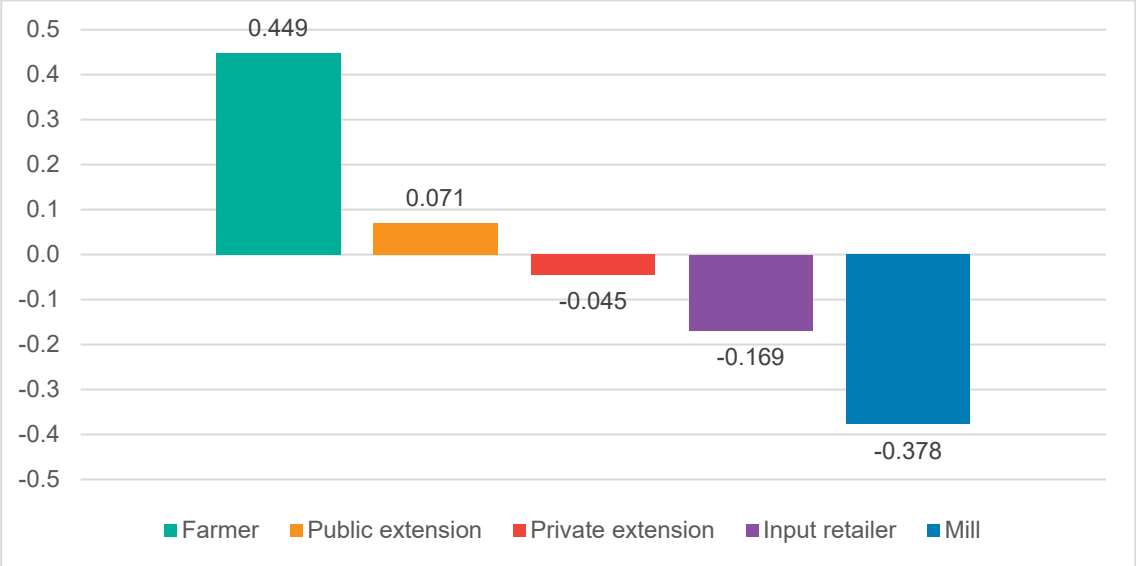
Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

6. TRUST IN AGRICULTURAL EXTENSION BY AGRO-INPUT RETAILERS

As shown above, agricultural extension is one of the most important services provided by agro-input retailers, but it is unclear whether farmers trust information from agro-input retailers more or less than from other sources. Agro-input retailers may exploit information asymmetries to increase sales, and farmers may recognize this and approach their advice with caution. Nevertheless, agro-input retailers are major sources of information, and understanding the relative trust farmers place in their advice is important.

Standardized best-worst scores from the BWS experiment concisely convey relative trust levels for different sources of information. Overall, there was a clear indication that farmers did not have strong trust in advice provided by agro-input retailers (Figure 6). Agro-input retailers were ranked second to last ahead of only mills, and had a negative score value, implying retailers were selected as 'least trusted' more often than 'most trusted'. In contrast, farmers strongly trusted information from other farmers, with a highly positive score. Farmers also demonstrated moderate levels of trust in public extension, which has a positive score and ranks second among the five sources. Trust in private extension was low, but third in order, well above agro-input retailers.

Figure 6. Standardized best-worst scores for trust in information from different sources

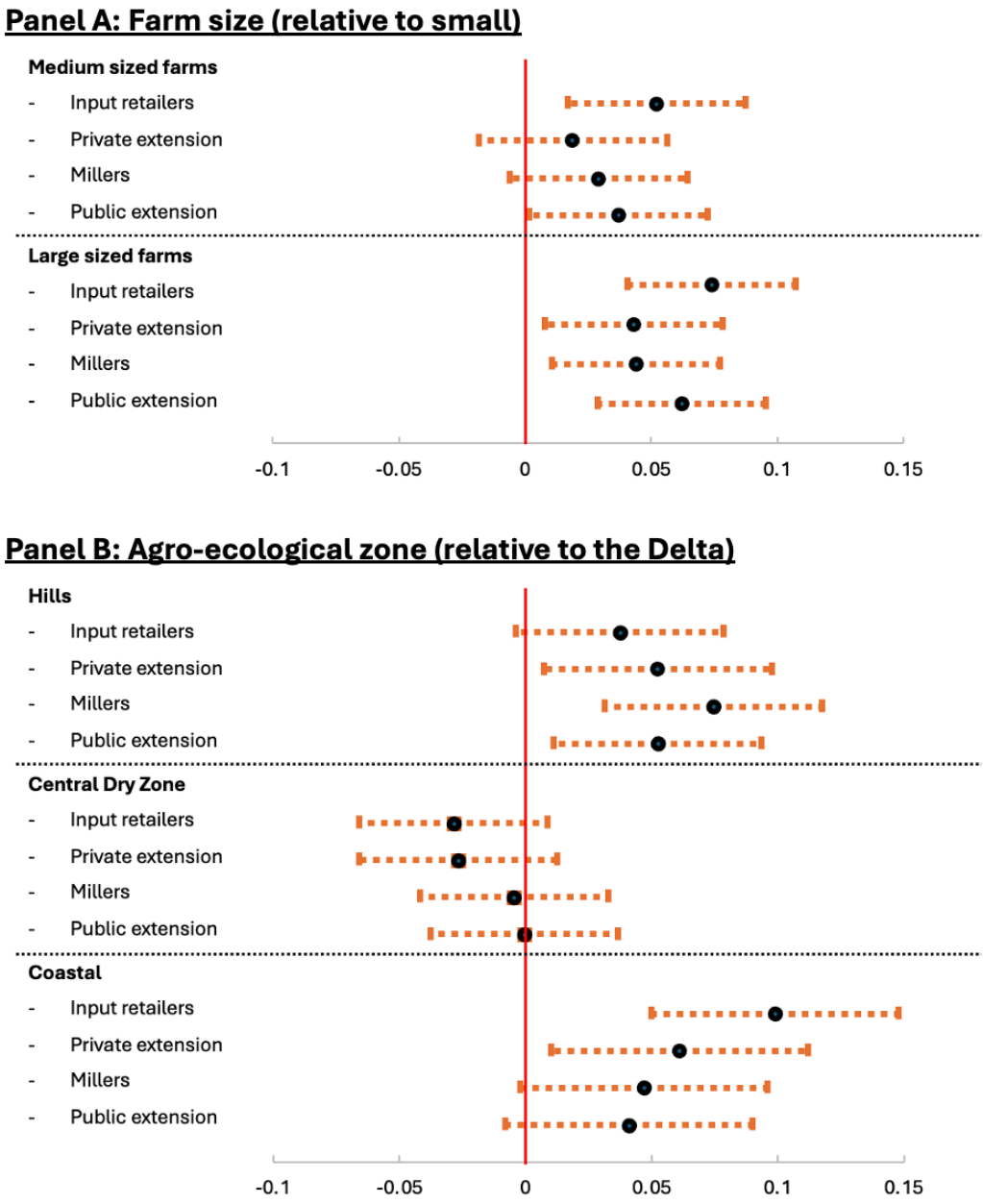


Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

To better understand what factors are associated with greater or lower relative trust in information from these sources we use regression analysis on farmer best-worst choices. Figure 7 plots marginal effects estimates and 95% confidence intervals of farm size (panel A) and agroecological zone (panel B) from conditional logit regressions, highlighting some important differences in farmers' relative trust levels (full results shown in Table A. 2). The base alternative in the estimation is information from other farmers (the overall most trusted source) and all estimated effects should be interpreted as relative to that.

Medium and large farmers show significantly higher relative trust in agro-input retailers compared to smaller farmers. Each effect estimate is positive suggesting that smaller farmers in general place greater trust in information from other farmers than other sources, and conversely large farmers in particular have greater relative trust in other sources, particularly public extension and input retailers. There are also interesting variations in trust by agro-ecological zones. Farmers in the Hills and Coastal areas display relatively more trust in non-farmer sources of information, relative to the Delta. We also see that education and gender show mostly insignificant differences in relative trust. All effects are negative for female farmers, implying that they place relatively greater trust in other farmers.

Figure 7. Marginal effects plots of information sources on trust



Note: 95% confidence intervals shown by orange brackets
Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

7. CONCLUSION

While agro-input retailers who distribute a diverse range of agricultural products have become more crucial for agricultural productivity increases in low- and middle-income countries, there has been limited research on the complementary services they provide. Relying on unique large-scale surveys of agro-input retailers as well as of farmers in Myanmar, we study the functioning of agro-input retailers, focusing on (i) complementary services provided on top of the distribution of agro-inputs, (ii) the inclusivity of small farms in accessing those services, and (iii) the trust farmers place in agricultural extension advice from agro-input retailers.

We find that most farmers depend on multiple agro-input retailers to obtain agro-inputs, and that the role of these retailers extends far beyond simply selling products. A significant portion of retailers provide other essential services – such as credit provision, agricultural extension, transport,

emergency loan provision, and buyers of output – becoming a one-stop shop within agricultural value chains (AVC). Credit provision and agricultural extension are the most important complementary services provided. However, we also find that small farms benefit significantly less from these services. Moreover, using a best-worst scaling experimental approach, we find that farmers – and especially smaller ones – often lack trust in the agricultural extension advice offered by these retailers, and in private extension sources in general, relative to peer farmers or public extension agents.

These insights matter for policymakers seeking to improve resource provision and consequent agricultural performance in these contexts. Agro-input retailers are emerging as key, dynamic actors in AVCs, providing farmers not only with access to inputs but several complementary services as well. However, there are challenges in inclusivity and trust. To realize the full potential of agro-input retailers in contributing to AVC development, policies are needed to strengthen their capacity, expand access to smaller farmers, and foster greater trust in the advice they provide.

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APPENDIX

Appendix 1: Best-worst scaling trust experiment set-up

We will now ask you 5 questions about your trust in agricultural production information from different sources. Each question has 3 options for source of information. For each question, please indicate which source is the most trusted option, and which source is the least trusted. You must select only one option as most preferred and only option as least preferred. Each option will appear on multiple lists of three. This is ok. Please consider only the three options on a given list when deciding which option is your most trusted and which is the least trusted on that particular list.

Enumerator: For each question, read the 3 options listed in order. Then ask the respondent to select the one option that is the most trusted, and the one option that is the least trusted.

Suppose you received information on agricultural production from the following sources, which do you trust the MOST and which do trust the LEAST?

Most trusted source	**Information sources**	**Least trusted source**

Appendix 2: Associates of complementary service delivery

All regressions show a positive association of service delivery with the size of the farm (compared to small farms as the default), with 10 of the 12 coefficients significant at conventional statistical levels (Appendix Table 1). The coefficients for the large farm group are significant for all five complementary services tested. The biggest coefficients are seen in the case of the provision of agricultural extension with large farms showing a 9 percentage point higher likelihood of receiving agricultural extension from agro-input retailers compared to small farms. This is 5 percentage points in the case of accessing credit. For medium-sized farms, the coefficient values decrease to 6 and 4 percentage points, respectively, but they remain highly significant. The results of the poisson regression are also highly significant, with a large farm having 0.28 more complementary services delivered to them by agro-input retailers than small farms, ceteris paribus.

Few other factors show consistent significant associations. Less educated farmers are less likely to receive agricultural extension while more remote farmers – as measured by the travel time to a city of at least 50,000 people – are less likely to receive agricultural credit or agricultural extension. The length of a relationship has been shown in multiple studies to matter enormously in these settings (Michler and Wu, 2020; Macchiavello et al., 2022). We also find here that the longer the farmer knows the agro-input retailer, the more likely the farmer is to receive these complementary services as shown by significant positive coefficients in all models. Coefficients on most agro-ecological zone dummies show negative coefficients compared to the Delta, the rice bowl and the most commercial area of the country (Minten et al., 2024a). Especially credit provision and agricultural extension are significantly more done in the Delta than in most other zones in the country, as shown by large and significant coefficients, suggesting that these complementary services are especially important in such commercial agricultural areas. We also note that agricultural extension and credit provision by agro-input retailers is more prevalent in areas characterized by more competition, as measured by a “lot of choice between retailers” variable.

Table A. 1. Associates of the provision of complementary services by the most used agro-input retailer of the farmer

		(1)	(2)	(3)	(4)	(5)	(6)
Variables	Unit	Mechanization	Output traders	Emergency loans	Credit	Extension	Number of services
				Linear probability model			Poisson
Characteristics farmer							
Medium	0/1	0.020	0.030*	0.007	0.036*	0.059***	0.139**
		(0.012)	(0.016)	(0.019)	(0.020)	(0.019)	(0.057)
Large	0/1	0.022*	0.059***	0.035*	0.051**	0.090***	0.253***
		(0.012)	(0.017)	(0.020)	(0.023)	(0.020)	(0.060)
Age	years	-0.000	-0.000	-0.001**	-0.001**	-0.001	-0.004**
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Manager of farm has primary education or less	0/1	-0.015	-0.006	-0.027*	-0.008	-0.067***	-0.124***
		(0.011)	(0.013)	(0.015)	(0.017)	(0.016)	(0.045)
Male	0/1	-0.012	-0.003	0.013	-0.005	0.005	-0.007
		(0.013)	(0.017)	(0.020)	(0.020)	(0.019)	(0.062)
Working hh members	#	0.001	0.003	0.017***	0.004	-0.002	0.024
		(0.005)	(0.006)	(0.006)	(0.007)	(0.006)	(0.019)
Remote farmer compared to a city of 50,000 people	0/1	-0.010	0.008	-0.014	-0.033	-0.036*	-0.104*
		(0.009)	(0.015)	(0.017)	(0.023)	(0.020)	(0.054)
Remote farmer compared to the border	0/1	-0.001	0.020	-0.005	0.013	0.035*	0.083
		(0.010)	(0.017)	(0.018)	(0.023)	(0.020)	(0.057)
Physical security	0/1	-0.006	-0.006	-0.005	-0.002	-0.009	-0.022
		(0.011)	(0.014)	(0.016)	(0.016)	(0.016)	(0.048)
Rural residence	0/1	0.001	-0.011	-0.007	0.012	0.051*	0.030
		(0.018)	(0.024)	(0.026)	(0.031)	(0.029)	(0.077)
A lot of choice between retailers (perception farmer)	0/1	-0.005	-0.004	0.001	0.027*	0.106***	0.151***
		(0.010)	(0.013)	(0.014)	(0.016)	(0.014)	(0.045)
Characteristics agro-input retailer							
Years that farmer knows retailer	#	0.002*	0.003*	0.006***	0.005***	0.006***	0.021***
		(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.004)
Distance to retailer	#	-0.000**	0.000	-0.000	-0.001***	-0.001***	-0.003***

		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Agri-ecological zones							
Hills	0/1	-0.013	0.028	0.030	-0.108***	-0.061**	-0.106
		(0.013)	(0.027)	(0.027)	(0.030)	(0.029)	(0.078)
Dry	0/1	-0.013	-0.028	-0.048**	-0.121***	-0.012	-0.215***
		(0.011)	(0.019)	(0.021)	(0.028)	(0.023)	(0.062)
Coastal	0/1	0.000	-0.012	-0.096***	-0.158***	-0.107***	-0.390***
		(0.015)	(0.025)	(0.026)	(0.048)	(0.038)	(0.117)
Constant		0.155***	0.190***	0.286***	0.692***	0.444***	
		(0.034)	(0.040)	(0.044)	(0.056)	(0.054)	
Observations		4,260	4,296	3,951	4,029	4,311	3,666
R2/Pseudo-R2		0.005	0.008	0.017	0.032	0.048	0.0135

Table A. 2. Marginal effects of information sources on choice probabilities (other farmer is the base alternative)

	Marginal Effects		Standard Errors
Level Effects			
Input retailers	-0.194	***	(0.022)
Private extension	-0.168	***	(0.022)
Mill	-0.243	***	(0.023)
Public extension	-0.131	***	(0.022)
Interaction Effects			
Medium (>3-7 acres) X …			
Input retailer	0.037	**	(0.018)
Private extension	0.029		(0.018)
Mill	0.019		(0.019)
Public Extension	0.052	***	(0.018)
Large (>7 acres) X …			
Input retailer	0.062	***	(0.017)
Private extension	0.044	**	(0.017)
Mill	0.043	**	(0.018)
Public Extension	0.074	***	(0.017)
Female farmer X …			
Input retailer	-0.018		(0.019)
Private extension	-0.050	***	(0.019)
Mill	-0.025		(0.020)
Public Extension	-0.014		(0.019)
High education (>median) X …			
Input retailer	0.012		(0.014)
Private extension	0.024	*	(0.014)
Mill	-0.006		(0.015)
Public Extension	0.002		(0.014)
Agri-ecological zones			
Hills			
Input retailer	0.051	**	(0.021)
Private extension	0.073	***	(0.022)
Mill	0.051	**	(0.023)
Public Extension	0.036	*	(0.021)
Dry Zone			
Input retailer	-0.002		(0.019)
Private extension	-0.006		(0.019)
Mill	-0.028		(0.020)
Public Extension	-0.030		(0.019)
Coastal			
Input retailer	0.041		(0.025)
Private extension	0.047	*	(0.025)
Mill	0.061	**	(0.026)
Public Extension	0.099	***	(0.025)

Notes: *** p<0.01, ** p<0.05, * p<0.1
Source: Authors' calculations based on the Myanmar Agricultural Performance Survey 2024

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