

Food Security Policy Project (FSPP)

AGRICULTURAL MACHINERY BUSINESS DEVELOPMENT IN SHAN STATE: A COMPARATIVE ANALYSIS

By

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Food Security Policy *Research Papers*

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EXECUTIVE SUMMARY

The report presents analysis of data from a survey of the 37 agricultural supply businesses in Shan State, Myanmar. The patterns reported are broadly consistent with the rapid growth of agricultural machinery supply businesses in Myanmar's Dry Zone and Delta, and with demand side surveys of agricultural machinery use in Shan. The following points stand out:

The growth and spread of machinery suppliers over the past decade has been dramatic.

The total number of machinery supply outlets nationally jumped 338% from 2008 to 2018, from 72 to 315, while the number of townships served by machinery dealerships increased from 36 to 88

A total of 44 machinery supply businesses are operational in Shan, accounting for 19% of the national total in 2018.

Three-quarters of all machinery supply enterprises currently operating in Shan were established after 2010. Growth in business numbers accelerated particularly rapidly from 2012 to 2016, but slowed somewhat in 2017-2018. The variety of machinery supplied by these businesses has diversified rapidly since 2012.

Engines, two-wheel tractors, and trawlerji are the best selling items. Total annual sales of these items remained fairly constant from 2014 to 2018. The number of businesses selling machinery jumped 76% over this period, suggesting that new entrants have secured a diminishing market share.

Sales growth in recent years has been driven by larger machines. Annual sales of four-wheel tractors jumped from 53 to 463 (an increase of 773%) while annual sales of combine harvesters climbed from zero to thirty. Combine harvester sales started later in Shan than in the Delta and or Dry Zone, beginning in 2016.

Access to hire purchase loans for machinery is less widespread in Shan than in the Dry Zone. Two-thirds of machinery suppliers in Shan offer some form of hire-purchase credit, as compared to 94% in the Dry Zone

Banks play a smaller role in financing agricultural machinery sales in Shan than in the Dry zone. Hire-purchase finance from banks account for a smaller share of sales than hire purchase loans from machinery suppliers or sales made without finance. This is the inverse of the situation to the Dry Zone

Access to finance may be less common in Shan than the Dry Zone because fewer farmers in Shan possess land use certificates that machinery dealerships often require as a guarantee for loans.

Low levels of formalized land use rights in upland areas of Myanmar may contribute to financial exclusion in these zones.

TABLE OF CONTENTS

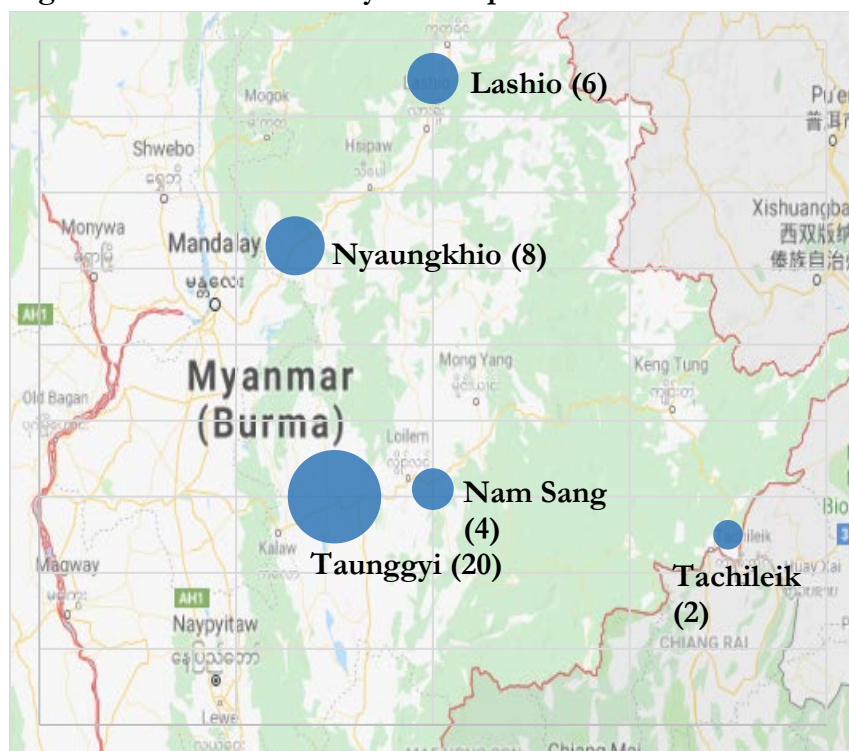
EXECUTIVE SUMMARY	iv
1. Introduction	1
2. Methods and Sample	1
3. Sectoral Structure	2
3.1 Spatial and temporal proliferation of machine supply businesses.....	2
3.2 Growth of new enterprises in Shan	4
4. Business Conduct	4
4.1 Product assortment	4
4.2 Sales.....	6
4.3 Financing.....	6
4.4 Repair and rental services.....	8
5. Conclusions	8
6. References	9

1. Introduction

Myanmar is undergoing a period of rapid agricultural mechanization. Previous studies in this series have documented the growth and transformation of agricultural supply businesses in the Dry Zone (Belton et al. 2019) and Delta (Win et al., 2016). Similar to the Delta and Dry Zone, southern Shan is also experiencing its own surge in agricultural mechanization, documented from the demand side by Soe and Kyaw, 2019. This report focusses on the supply side of agricultural mechanization in Shan State, presenting results from a survey of 37 agricultural machinery supply businesses.

The report is organized as follows. Section 2 presents details of the survey methodology and sampling strategy. Section 3 analyzes the spatial and temporal spread of machinery businesses, nationally and in Shan. Section 4 details the behavior of machinery supply businesses in Shan in terms of product assortment and sales, provision of customer finance and repair and rental services. Section 5 concludes.

Figure 1 Location of surveyed enterprises



2. Methods and Sample

Prior to survey implementation, scoping visits were conducted throughout the main urban centers in southern and northern Shan State, including Taunggyi, NyaungShwe, Nam Sang, Aung Ban, Nawnghkio, Lashio, and Muse, as part of a larger survey of maize traders and agricultural input suppliers. Forty-three agricultural machinery supply businesses were identified

during scoping. At the time of the survey, these businesses were believed to represent the complete universe of agricultural machinery suppliers in Shan State. Four of the businesses listed declined to be interviewed, giving a final sample of 37 interviews. The 37 businesses interviewed were comprised of 34 individual companies. Where businesses operated more than one branch, all branches listed in the sample frame were interviewed. All interviews were conducted during the first half of December 2018.

The survey instrument was designed to elicit information on type and volume of machinery sales, modes of financing sales, provision of services to customers, and the location and time of establishment of all the branches operated by each business. Analysis of data from the survey identified the existence of seven machinery supply businesses in Shan that were not included in the survey sample frame. Thus, our sample of 37 out of 44 enterprises covers 84% of the known machinery supply shops in Shan State, including most of the largest. Information on the location and year of establishment of all the branches belonging to surveyed machinery businesses was pooled with data collected during earlier surveys of machinery supply businesses in the Delta and Dry Zone to provide an expanded picture of the spatial and temporal spread of machinery businesses.

3. Sectoral Structure

This section presents historical trends in the establishment and spatial distribution of agricultural machinery supply businesses nationally, and in Shan.

3.1 Spatial and temporal proliferation of machine supply businesses

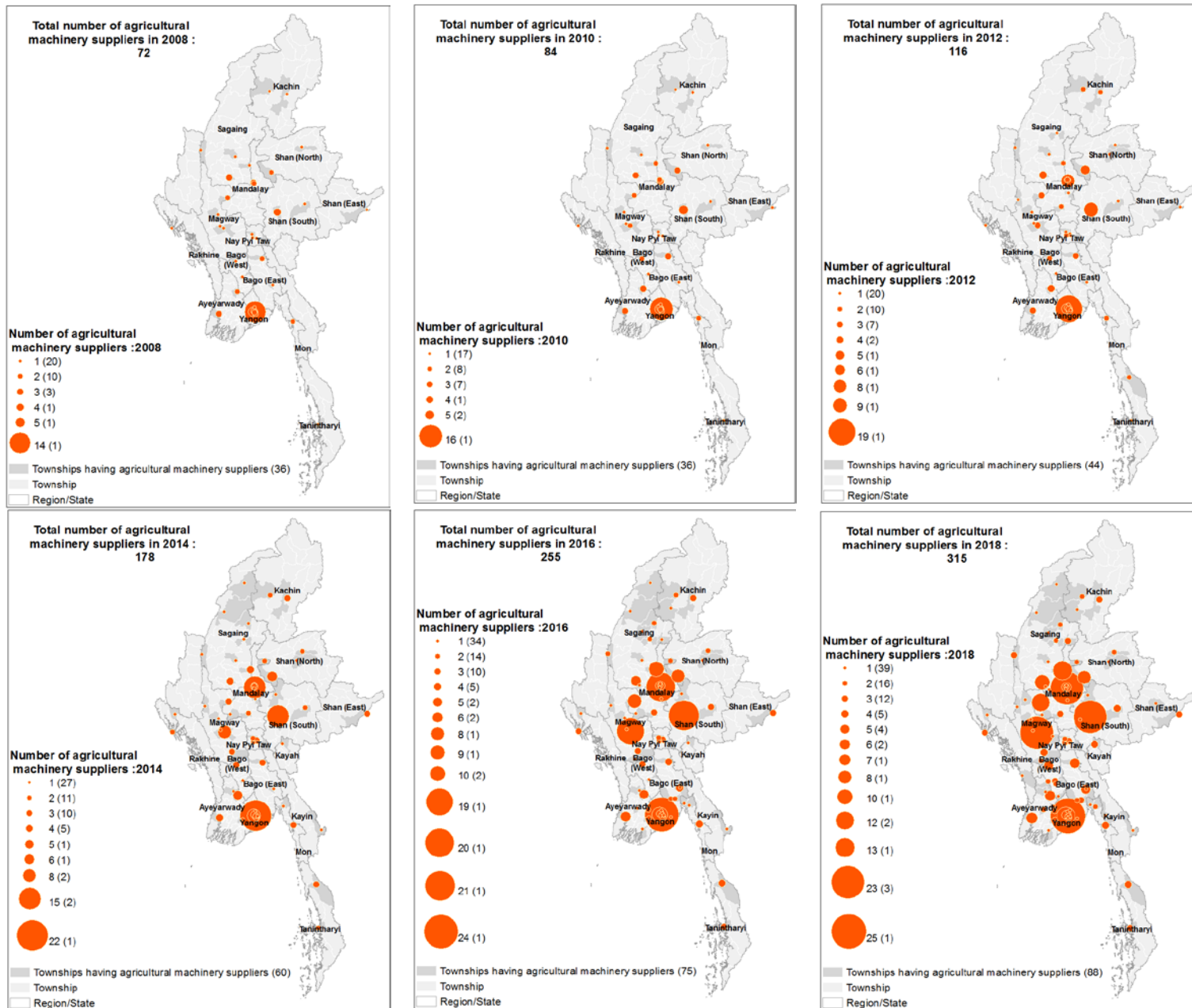
Machinery supply outlets have radiated out over time and space, from urban centers adjacent to the main rice growing areas that were the first to begin the process of mechanization (i.e. the Delta and irrigated areas of the Dry Zone and southern Shan State). Over time, these businesses have spread throughout parts of the Dry Zone growing non-rice crops and, finally, to “peripheral” hinterland zones in the uplands and border areas. The geographical deconcentration of these businesses has helped to make agricultural machinery locally available for purchase over progressively greater swathes of the country, contributing to accelerating uptake by sub-national zone.

Growth and spread of sales outlets over the past decade has been dramatic. The total number of machinery supply outlets reported in our combined supply side surveys jumped 338% from 2008 to 2018 (up from 72 to 315), while the number of townships served by machinery dealerships increased from 36 to 88 (Figure 2).

Numbers of machinery supply businesses grew very slowly during the 1980s and 1990s, and were concentrated in Yangon - Myanmar’s largest commercial center, located in the country’s ‘rice bowl’, the Ayeyarwady Delta. From 2000-2010 numbers of businesses increased gradually in the Delta, Dry Zone and southern Shan, but remained concentrated in the Delta (which accounted for more than half of all businesses during this time), and especially Yangon. The first machinery supply businesses outside of these three zones, were established in 2006, in the border/upland states of Mon, Tanintharyi and Rakhine. Since this time, the number of businesses in all three zones has continued to climb, but the Delta’s share in the total has fallen,

from 42% in 2012 to 34% in 2018. Shan's machinery supply businesses accounted for 19% of the national total in 2018.

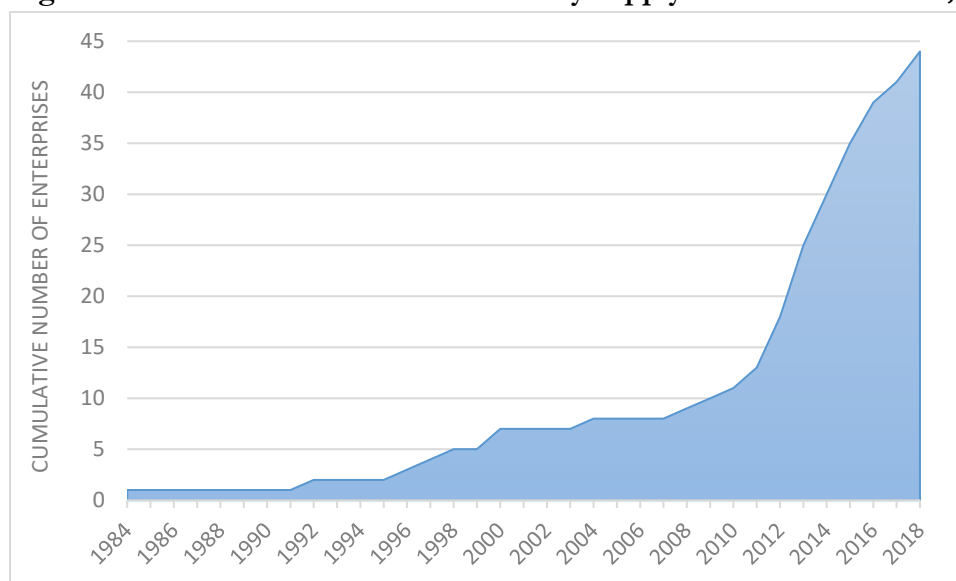
Figure 2 Location and number of Myanmar machinery supply businesses, 2008-2018 (Combined Shan, Dry Zone and Delta surveys)



3.2 Growth of new enterprises in Shan

Three-quarters of all machinery supply enterprises currently operating in Shan were established after 2010. The first agricultural machinery supply business in Shan was established in 1984, but growth in businesses numbers was initially very slow. Ten businesses were established between 1992 and 2010. Growth accelerated particularly rapidly from 2012 to 2016, during which time 26 enterprises were established. The proliferation of machinery supply businesses slowed somewhat in 2017-2018, during which time a further five enterprises were opened, for a total of 44.

Figure 3 Cumulative number of machinery supply businesses in Shan, by year



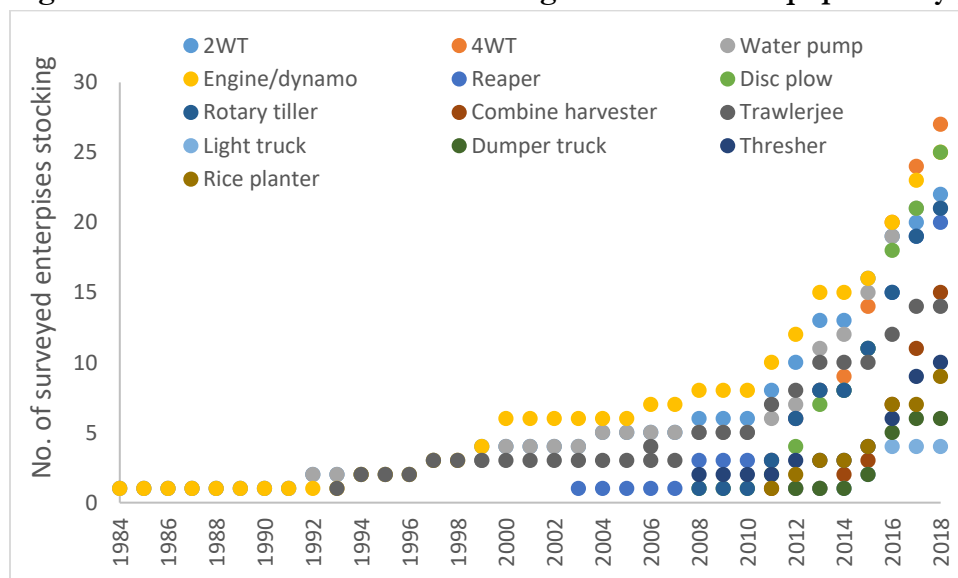
4. Business Conduct

This section summarizes the behavior of machinery supply businesses in Shan region in terms of product assortment, sales volumes, provision of customer finance, and machinery rental and repair services.

4.1 Product assortment

The variety of agricultural machinery supplied by enterprises in the Shan region has improved dramatically over time. This equipment is available from rapidly increasing numbers of outlets due to concurrent growth in enterprise numbers. In 1990, the only machines available for sale in Shan were two-wheel tractors (2WT), engines, and water pumps. In the mid-1990s and early 2000s, suppliers began to stock other small machines, including trawlerji (simple farm vehicles powered by 2WT engines) and reapers. The assortment of machinery supplied diversified rapidly after 2010. All thirteen types of agricultural machinery that are currently stocked by suppliers in Shan were available for sale by 2012 (Figure 4).

Figure 4 Number of businesses stocking machines and equipment by year (1984-2018)



Four-wheel tractors (4WT) and disc plows are the most commonly stocked items, sold by 73% and 70% of branches, respectively. Although threshers and maize shellers are used widely in Shan (Soe and Kyaw, 2019), they are stocked by only 2% of machinery dealers. This is likely because they are manufactured locally and sold directly to customers, unlike the mainly imported items sold by machinery suppliers (Table 1).

Table 1 Machinery and equipment sales (number) by Shan machinery suppliers (2018)

Item	% of branches selling	Mean sales per branch	Median sales per branch	Total sales
Engine	68	303	30	7572
2 wheel-tractor	57	184	30	3854
Trawlerji	38	113	23	1583
Disc plow	70	28	6	699
Reaper	54	35	19	698
4 wheel-tractor	73	17	5	463
Water pump	56	25	15	502
Rotary tiller	59	10	1	209
Thresher/Maize sheller	2	37	9	37
Dumper truck	16	10	0	59
Combine harvester	41	2	0	30
Light truck	11	6	0	25
Rice planter	24	2	0	15

4.2 Sales

The items most commonly sold by machinery suppliers in Shan are engines, 2WT, and trawlerji. Surveyed businesses sold a total of 7572, 3854, and 1583 units of each, respectively, in 2018. Engines can be used for multiple purposes, including powering 2WT and trawlerji, and generating electricity. Sales of 2WT were 8.3 times greater than sales of 4WT (463 units respectively), reflecting soil type, crop choice and differences in price. Sales of disc plows (699) and rotary tillers (209) are of a similar order of magnitude to 4WT, with which they are used as attachments. Total water pump sales of 502 reflect somewhat limited access to irrigation sources, but are still considerably higher than reported in the Dry Zone by Belton (2019).

Total annual sales of some of the most common small machines (engines, 2WT, trawlerji, water pumps) remained fairly constant from 2014 to 2018 (Table 2). The number of businesses selling machinery jumped 76%, over this period, suggesting that new entrants secured a diminishing market share.

Sales growth was driven by larger machines. 4WT sales jumped 773%, from 53 to 463 between 2014 and 2018 (Table 2). Sales for 4WT attachments also increased. Sales of combine harvesters (CH) began in 2016, three years later than in the Delta (Win et al., 2016) and two years later than in the Dry Zone (Belton et al. 2019), growing from 8 in 2016 to 30 in 2018.

Table 2 Sales of machinery and equipment by Shan enterprises, by year (2014-2018)

Item	2014	2015	2016	2017	2018
4 wheel-tractor	53	191	251	408	463
Disc plow	468	566	595	740	699
Rotary tiller	57	93	209	204	209
Combine	0	0	8	23	30
Engine/dynamo	9200	8429	8430	7833	7572
2 wheel-tractor	3965	4235	3936	3815	3854
Reaper	420	490	550	621	698
Trawlerji	1764	1994	1979	1723	1583
Dumper truck	0	6	53	58	59
Water pump	609	610	636	573	502
Thresher/maize sheller	505	470	485	426	372
Light truck	0	0	20	60	25

4.3 Financing

Provision of hire purchase finance is less widespread in Shan than in the Dry Zone. Two-thirds (67%) of machinery suppliers offer some form of hire-purchase credit, as compared to 94% in the Dry Zone (Belton et al., 2019).

Banks play a smaller role in agricultural machinery financing in Shan relative to the Dry zone. Forty-three percent of machine suppliers provide hire purchase financing facilities directly to

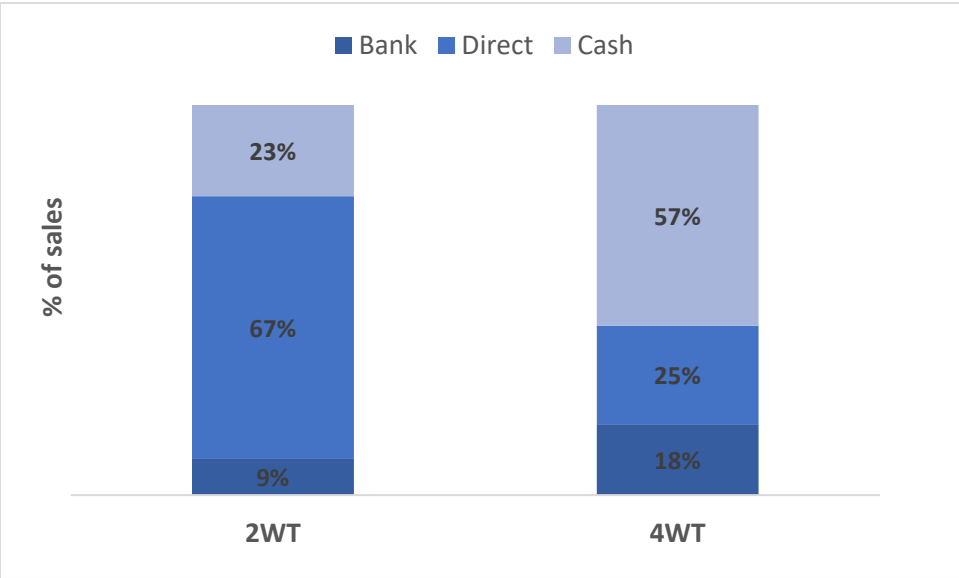
customers, and the same number partner with one or more banks in order to do so. In the Dry Zone, 46% of machine suppliers offer direct hire-purchase finance, while 84% do so in partnership with banks (Belton et al., 2019)

Hire-purchase finance from banks account for a smaller share of sales than hire purchase loans from machinery suppliers or sales made without finance. This is the inverse of the situation to the Dry Zone, where hire purchase finance from banks accounts a large majority of sales 2WT, 4WT and CH (Belton et al., 2019).

We hypothesize that sales financed by banks are less common in Shan than in the Dry Zone because fewer farmers in Shan possess formal land use certificates (Form 7) that can be used to guarantee loans¹. The majority of 2WT sales in Shan (67%) are funded using finance provided by machine suppliers, and only 9% are financed by banks. The majority of 4WT sales (57%) are financed by customers, with 25% financed by machinery dealers and 18% financed by banks. Some machinery dealerships may be willing to finance sales to farmers without these documents because customers are well known to them and are able to provide character references.

Liquidity constraints on the part of dealers may account for the low share of 4WT sales financed by machinery dealerships, who may have insufficient working capital to finance for sales of large numbers 4WT, which are expensive items.

Figure 5: Share of sales in 2018 by source of finance



Yoma Bank has by far the largest market share among banks offering hire purchase loans for agricultural machinery. Forty-four percent of machinery suppliers in Shan that partner with banks providing hire-purchase loans work with Yoma. Myanmar Citizens Bank (MCB) and Asia Green Development Bank (AGD), each account for 17% of partnerships.

¹ Only 12% of agricultural parcels in southern Shan have a Form 7 title document (Win and Zu, 2019) as compared to 87% of agricultural parcels in the Dry Zone (Hein et al., 2017)

4.4 Repair and rental services

Over half (55%) of agricultural machinery suppliers offered repair services to customers in 2018. Among these, 88% and 29% repaired 4WT and threshers/maize shellers respectively, but no suppliers provided repair services for 2WT. The total number of 4WT repaired in 2018 was 258 – equivalent to a little more than half the number of 4WT sold that year. Repair services for 2WT are likely to be available at village level. 4WT are more sophisticated machines and may require more specialized mechanical services, some of which may be provided by machinery suppliers as part of their after sales service.

Very few agricultural machinery suppliers (8%) rent out agricultural machinery to customers in Shan. This figure is similar to that reported in the Dry Zone (Belton et al. 2019), and suggests that decentralized hiring services provided by farmers who own agricultural machinery may offer competitive advantages over centrally coordinated services.

5. Conclusions

The report presents analysis data from a survey of the 37 agricultural supply businesses in Shan State, Myanmar. The patterns reported are broadly consistent with the rapid growth of agricultural machinery supply businesses in Myanmar's Dry Zone (Belton et al., 2019) and Delta (Win et al., 2016), and with demand side surveys of agricultural machinery use in Shan (Soe and Kyaw, 2019). The following points stand out:

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Growth of machinery supply businesses in southern Shan began to take off around the same time as in the Dry Zone. A total of 44 machinery supply businesses are operational in Shan, accounting for 19% of the national total in 2018.

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