MYANMAR’S CORN VALUE CHAIN

May 2017
MYANMAR CORN VALUE
CHAIN KEY STATISTICS

Corn is one of Myanmar’s top 10 crops (#8 in planted acres in 2015) and is an important cash crop for farmers in several states.

Estimated market value in 2016-17 = $US 357 million (2.10 MMT x $170 per MT)

Production and Harvested Area are trending upward.

<table>
<thead>
<tr>
<th>Year</th>
<th>Production MMT</th>
<th>Harvested Area ha</th>
<th>Yield MT / ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 -15</td>
<td>1.95</td>
<td>470,000</td>
<td>4.1</td>
</tr>
<tr>
<td>2015 -16</td>
<td>1.99</td>
<td>510,000</td>
<td>3.9</td>
</tr>
<tr>
<td>2016 -17</td>
<td>2.10</td>
<td>520,000</td>
<td>4.0</td>
</tr>
<tr>
<td>2016 -18e</td>
<td>2.25</td>
<td>530,000</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Average yields are ~4 MT per hectare. High-yield hybrid seeds account for ~90% of planted area. Hybrid seed is mainly produced domestically by CP Myanmar or imported from several Thai suppliers.

Source: USDA FAS - Grain and Feed Annual 2016, 2017
DISTRIBUTION OF CORN HARVESTED AREA IN MYANMAR

as of March 2015

Source: Field Corn in Myanmar, Union Data, Updated 31 March 2015
A 2016 World Bank survey of farm production economics in Myanmar found that profitability of corn production was the highest among all crops analyzed in the survey.

### MYANMAR CORN PRODUCTION ECONOMICS

<table>
<thead>
<tr>
<th></th>
<th>Northern Interior</th>
<th>Southern Interior</th>
<th>Total or Weighted Ave</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Farms</td>
<td>83</td>
<td>97</td>
<td>180</td>
</tr>
<tr>
<td>Gross Margin $US/ha</td>
<td>919</td>
<td>810</td>
<td>854</td>
</tr>
<tr>
<td>Net Margin $US/ha</td>
<td>767</td>
<td>744</td>
<td>759</td>
</tr>
<tr>
<td>Labor Prod $US/ha</td>
<td>18.04</td>
<td>16.36</td>
<td>17.04</td>
</tr>
<tr>
<td>Total Costs $US/ha</td>
<td>513</td>
<td>396</td>
<td>450</td>
</tr>
</tbody>
</table>

Source: The World Bank
COST ELEMENTS OF CORN PRODUCTION IN SHAN STATE

<table>
<thead>
<tr>
<th></th>
<th>Northern Interior</th>
<th>Southern Interior</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Inputs</td>
<td>16%</td>
<td>24%</td>
<td>21%</td>
</tr>
<tr>
<td>Hired Labor</td>
<td>43%</td>
<td>22%</td>
<td>27%</td>
</tr>
<tr>
<td>Own Labor</td>
<td>16%</td>
<td>22%</td>
<td>19%</td>
</tr>
<tr>
<td>Livestock, Machinery, and Fuel</td>
<td>32%</td>
<td>30%</td>
<td>32%</td>
</tr>
<tr>
<td>Interest on Working Capital</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The World Bank
~ 50% of Myanmar's annual corn production is exported. Lower demand from China over the past year has caused this percentage to decline.

~ 98% of exports go to China via border trade. The rest goes to Singapore, Malaysia, the Philippines, Vietnam, and Pakistan via Yangon or other ocean ports.

Nearly all of Northern Shan's production and much of Southern Shan’s supply is exported to China through the border town of Muse. Some corn is exported to China via Kunlon, Nanfu, Ho-pang, and other points east of Hsenwi. One dealer reported that his Muse export volumes could total 6,000 to 7,000 50-kg bags per day, but other routes could take only about 1,000 bags per day.
Domestic Use

DEMAND FOR MYANMAR CORN

- ~40% of annual corn production goes to domestic use. This percentage has grown in recent years.
- Most domestic corn goes to feed mills in Yangon, Mandalay, and Shan State.
- Estimated total feed production capacity of the top 12 feed mills in Myanmar is ~100,000 tons per month.
- There are currently 5 international feed companies operating feed mills: CP (Thailand), Japfa (Indonesia), Sunjin (Korea), New Hope (China), and DeHeus (Netherlands). Green Feed (VN), Betagro (Thailand), and Cargill (US) are reported to be planning investments.
- Domestic corn usage and production is expected to grow steadily in line with the growth of Myanmar's livestock industries, especially poultry and swine.
MYANMAR CORN SUPPLY AND USE

Source: USDA
Marketing years are October - September.
WORLD CORN PRICES
APRIL 2007 - MARCH 2017

Source: The World Bank
COMPARING WORLD AND MANDALAY CORN PRICES
JANUARY 2010 - DECEMBER 2014
MONTHLY DOMESTIC WHOLESALE CORN PRICES IN 2016

Source: USDA
Producers use tractors for land preparation and tillage, but the other aspects of corn production in Myanmar—including planting and harvest—are still done by hand.

After harvest, most corn is sun-dried on concrete floors. The grain is then packed in 50 kg bags and loaded onto trucks. There is little mechanization in this process.

Mechanical dryers have a poor reputation and low adoption in Myanmar. Existing dryers are wood-fired, low tech, and do not produce good quality grain. Multiple dealers said Chinese buyers prefer sun-dried because mechanical drying imparts an undesirable smoky smell to the grain. A dealer in Lashio said she bought a dryer three years ago, but it has not been a good investment.

The lack of drying equipment creates a bottleneck in the supply chain during harvest, which can cause the grain market for farmers to freeze because there is no market for wet grain.

There is a big opportunity to introduce more modern drying equipment. In addition to their greater efficiency, modern dryers result in higher-quality grain than is produced by sun drying.
QUALITY STANDARDS

Myanmar corn quality standards need to improve, especially as domestic feed use grows in importance. Labor-intensive post-harvest handling of corn in Myanmar (drying on the floor, bagging, loading, etc.) creates cracked and broken grain and can lead to high levels of aflatoxin infestation. A corn dealer in Taunggyi said export buyers in Muse “take anything,” but CP and other feed mills have relatively higher quality standards.

Typical quality specifications include:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Maximum Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity (Moisture)</td>
<td>14%</td>
</tr>
<tr>
<td>Mixture</td>
<td>1%</td>
</tr>
<tr>
<td>Broken or Damaged Seeds</td>
<td>3%</td>
</tr>
<tr>
<td>Live insects and fungus</td>
<td>None</td>
</tr>
</tbody>
</table>

Buyers of high quality corn may also require aflatoxin levels of not over 20 PPB.
Producers
Small or large farmers who raise the corn crop.

Sub Dealers
Agents of Dealers who have frequent and direct contact with Producers. One Dealer will often have multiple Sub Dealers, some of whom are themselves producers maintaining commercial relationships with neighboring small producers.

Dealers
Dealers purchase inputs from Input Providers and distribute them, via Sub Dealers, to Producers at the start of the growing season. Later, Dealers purchase corn from Producers and Sub Dealers, then sell it to Domestic and Export Buyers. Dealers often work through multiple Sub Dealers. Some dealers specialize only in seed sales and grain trading, and do not deal in fertilizer or agricultural chemicals.

Input Providers
Key Input Providers include suppliers of hybrid seed, agricultural chemicals, and fertilizer. Most inputs are imported from Thailand or China.

Domestic Buyers
Domestic Buyers include feed mills, poultry farms, and pig farms.

Export Buyers
The majority of Myanmar's corn crop is exported to China via border trade at Muse. Export Buyers may be Chinese companies or Myanmar individuals who specialize in cross-border transactions at Muse.
MYANMAR CORN VALUE CHAIN

Growing Season
May – August

- Input Providers sell inputs to Dealers on credit or cash.
- Dealers and Sub Dealers provide inputs to Producers on credit or cash sales.

Producers

Sub Dealers

Dealer

Input Providers

Export Buyers

Domestic Buyers

- Self-Financing
- MFIs
- Cooperatives
- Money Lenders

- Self-Financing
- Banks

Commodity Flows
Financial Flows
Input Flows
MYANMAR CORN VALUE CHAIN

Harvest Season
*September – December*

- Dealers buy grain from Producers with cash, deducting the value of inputs provided on credit.
- Dealers sell a portion of the grain to Buyers, generating cash to repay input providers. The rest is stored.
- Dealers may borrow to buy more grain.

---

**Commodity Flows**
- Producers → Sub Dealers → Dealer → Export Buyers → Domestic Buyers

**Financial Flows**
- Producers → Sub Dealers → Dealer → Export Buyers → Domestic Buyers

**Input Flows**
- Input Providers → Sub Dealers → Dealer → Export Buyers → Domestic Buyers

---

- **Self-Financing**
- **MFIs**
- **Cooperatives**
- **Money Lenders**

- **Self-Financing**
- **Banks**
- **Money Lenders**

- **Self-Financing**
- **Banks**

---

- **Domestic Buyers**
- **Export Buyers**
- **Sub Dealers**
- **Dealer**
- **Input Providers**
- **Producers**

---
MYANMAR CORN VALUE CHAIN

Off Season
January – April

• During this period, when prices are generally higher, Dealers sell stored grain to Domestic and Export Buyers.

• Some sales from inventory are put off until as late as August.

Domestic Buyers

Export Buyers

Producers

Sub Dealers

Dealer

Input Providers

Commodity Flows
Financial Flows
Input Flows

- Self-Financing
- Banks
- Money Lenders

• During this period, when prices are generally higher, Dealers sell stored grain to Domestic and Export Buyers.

• Some sales from inventory are put off until as late as August.
# MYANMAR CORN VALUE CHAIN
## SEASONAL TIMELINE

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Producers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Receive Inputs In Kind</td>
<td>Most Receive Inputs In Kind</td>
<td>Repay Debt for Inputs (Deduct from Sales)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Provide Inputs In Kind</td>
<td>Most Provide Inputs In Kind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub Dealers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Receive Inputs In Kind</td>
<td>Most Receive Inputs In Kind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Provide Inputs In Kind</td>
<td>Most Provide Inputs In Kind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dealers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Receive Inputs In Kind</td>
<td>Most Receive Inputs In Kind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Provide Inputs In Kind</td>
<td>Most Provide Inputs In Kind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sell Stored Grain</td>
<td>Sell Stored Grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input Providers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Receive Working Capital</td>
<td>Receive Working Capital</td>
<td>Receive Payment for Inputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide Inputs In Kind</td>
<td>Provide Inputs In Kind</td>
<td>Repay Working Capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Buyers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Buy Grain</td>
<td>Buy Grain</td>
<td>Buy Grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Even for export sales, dealers in Shan State seem to work mainly on the Myanmar side. For example, a large dealer in Lashio said Chinese buyers come to his family’s warehouse in the 105-Mile zone to negotiate purchases destined for export via Muse. Payments are made in Yuan through a bank on the Chinese side.

Another Lashio dealer said Chinese buyers send Yuan to a Yangon bank via the hundi network, then the Yangon bank remits Kyat to a Lashio bank. Dealers noted that Yuan exchange rates are better in Yangon than in Mandalay or Muse.

Muse transactions are usually 100% cash, with no credit payments involved. However, one dealer in Hsipaw said it can take up to two weeks to receive payment, mainly because of buyers using the float and/or transfer system inefficiencies.
During harvest season, dealers re-sell some corn purchases immediately to generate cash to repay input providers, then store the rest. Reported turnover times (from purchase to sale) for corn not destined for long-term storage were about 2-3 days.

A dealer in Hsipaw noted that he gets better prices if he stores the corn and sells it around August, just before the next harvest. His maximum storage time is eight months. Most of the grain maintains good quality even with long-term storage, and losses are uncommon.

Another dealer in Lashio said her maximum warehousing time was 15 days, indicating that not all dealers store corn long-term.
FINANCING ACTIVITIES

The value chain map shows that trade credit from Input Providers is the main source of financing in the corn value chain. As such, Input Providers carry substantial credit risk, which limits volumes they can provide to individual dealers.

Credit terms for inputs vary tremendously, depending on size and sales volume of the dealer. Dealers with low credit-worthiness must pay COD or within 15-30 days. Bigger, more established dealers receive credit for 6 months or more, along with substantial price discounts. Effective interest rates on input credit is typically 1-2% per month.

A seed dealer in Lashio underlined this idea that seed companies carry most of the credit risk in the value chain because they give trade credit that flows all the way to the farmer (from the seed company to dealers, then from dealers to sub dealers, then from sub dealers to farmers).

Dealers provide upstream financing in some cases. For example, one dealer in Lashio said she receives seed from CP on credit, then advances seed, fertilizer, and cash to village leaders for distribution to farmers. She charges either no interest or “the bank rate” for these loans. Another dealer in Lashio said he finances his sub dealers with cash.
FINANCING ACTIVITIES

- Except for one dealer in Yawksawk who had a bank loan, all dealers claimed that trade credit from input providers and self-financing were their only sources of financing. Some said they would be interested in bank financing to grow their business, but others were not interested.

- The Yawksawk dealer’s loan is a 3-year term loan at 13% interest. His personal residence in Taunggyi serves as collateral. Interest payments are quarterly and principle payments are annual. This product is poorly suited to the dealer’s seasonal cash flow requirements.

- Value chain actors indicted that financing from non-bank money lenders is available at 2% per month.
WHAT COULD VALUE CHAIN ACTORS DO WITH BANK FINANCING?

I. Increase Their Volumes

- A dealer in Lashio said working capital financing from a bank would allow him to increase volumes. Previously, when a bank talked to him about a loan, he was interested, but he was turned off by the amount of paperwork and red tape in the application process.

- Another Lashio dealer also said she needs more capital to expand her business. She is a bank deposit customer, but she has never asked for or been offered a loan.

- A farmer and corn dealer in Gokhteik said he needs working capital to buy more grain during the harvest season. He has wanted to do business with a bank for some time, and was offered a loan in the past, but his rural location has made banking difficult.

- A corn trader and chicken farmer in Kyaukme already does $US 1 million in business, but thinks he could do more with access to additional liquidity.
WHAT COULD VALUE CHAIN ACTORS DO WITH BANK FINANCING?

2. Purchase Equipment and Property

- A dealer in Lashio would be interested in a new, high-quality corn cleaning machine (to remove foreign material and increase quality to fetch better prices).
- A dealer in Hsipaw said he would also be interested in cleaning and classifying equipment, and might want to add storage space.
- The manager of a corn drying facility in Hsipaw wants to buy a shelling machine so he can start buying corn cobs.
- A farmer and corn dealer in Gokhteik wants to buy another 22-wheel truck to haul corn.
WHY ARE SOME VALUE CHAIN ACTORS NOT INTERESTED IN BANK FINANCING?

1. Perceived Increase in Risk
   - A large seed dealer in Lashio said she was not interested in a bank loan because she did not want to increase her risk exposure.
   - Likewise, a corn dealer in Hsipaw said he was not keen to increase his risk exposure after being burned by falling corn prices last year.

2. Lack of Expansion Opportunities
   - A dealer in Hsipaw said he did not think a bank loan could help him grow his business because local traders can already buy up the area’s supply with self-financing.
WHY ARE SOME VALUE CHAIN ACTORS NOT INTERESTED IN BANK FINANCING?

3. Interest Rates and Loan Fees are Too High
   - Another Hsipaw dealer said a bank loan would allow him to buy more grain to store, but the interest rate of 13% and additional loan fees are too high in relation to the profit potential of trading corn. Lower interest rates and fees would make bank loans more attractive.

4. Lack of Experience with Banks
   - A farmer and corn dealer in Gokhteik said none of his farmer customers use banks, and he thinks these farmers would be nervous about borrowing from bankers they do not know.

5. Too Much Hassle
   - Most corn grain dealers currently finance their operations through their own cash flow and informal lending channels. Several dealers said that securing bank financing involves too much paperwork and time.
Dealers store large volumes of corn that could be used as collateral for working capital loans.

Banks should partner with a private warehouse management company to pilot a corn inventory financing program in Shan State.

A Hsipaw dealer said he would be open to the idea of using corn inventory as collateral, especially if inventory were used in lieu of traditional collateral (i.e. Form 7 for real property). A bank branch manager in Kyaukme said she was familiar with the concept of inventory financing and thinks it could work for corn.

Working capital loans should match the seasonal cash flows of corn dealers, even if loans continue to be collateralized by traditional means such as real property.
Hire-purchase financing currently exists for farm-level equipment, such as tractors and combine harvesters, but banks could expand this into new districts and by financing planters, tillage equipment, and other machinery.

Banks should also work to provide more financing to dealers for grain drying, processing, and transport equipment through hire-purchase financing or facilities loans. The value chain needs more efficient, higher-capacity dryers that result in better quality grain. Currently, most corn is sun-dried on concrete floors, which increases handling, cracked-broken grain, which causes increased aflatoxin contamination. Mechanical dryers are used in Shan State, but most are very low efficiency, fueled by wood or low-grade coal, and do not produce high quality grain.

Improved drying equipment will also reduce bottlenecks in the supply chain during harvest and improve marketing opportunities for dealers and farmers.
DEALER INTERVIEW LOCATIONS

Northern Shan
- Lashio
- Hsipaw
- Kyaukme
- Gokhteik
- Pyin Oo Lwin

Southern Shan
- Yawksawk
- Taunggyi
- Aungban
- Mandalay
DEALER PROFILES

A dealer in Lashio buys grain from farmers and sells it to Chinese buyers. He has a network of 3-4 sub dealers in other districts, who he financed with cash. His family owns two warehouses, including a large one in Muse and another in the 105-Mile zone. He said the key to his business is collecting as much grain as possible from around Lashio. He also trades sugar and soy, but not a lot. He is 100% self-financed.

Another dealer in Lashio is one of CP’s biggest seed dealers in Myanmar, and also a corn dealer. She has many sub dealers. She has a warehouse in Muse, from which she sells grain to Chinese buyers. Aside from receiving seed from CP on credit, she is currently 100% self-financed.

A dealer in Hsipaw distributes seeds and other inputs, then buys corn and sells it to Muse. He also trades sesame, peanuts, and a few other crops, but not as much as he used to. He owns five trucks for collecting and distributing grain. He is 100% self-financed.
Another dealer in Hsipaw stores grain at his home warehouse. He is 100% self-financed.

A corn dealer and chicken farmer in Kyaukme currently has 9,000 chickens. He gets one-day-old chicks from CP and sells eggs directly to Mandalay. He also sells inputs on credit to about 50 farmers. His current annual turnover is about $US 1 million, but he could do more if he had access to additional liquidity. He is 100% self-financed except for the trade credit he gets from CP.

A dealer and farmer in Gokhteik farms 300 acres, 100 of which he owns. His main crop is corn. In addition to farming himself, he sells inputs (CP, Seed Asia, and others) to a customer base of 500 other farmers and buys their grain. He obtains inputs with a combination of cash and trade credit, and re-sells them to customers on credit. In a typical year, he sells 100,000 bags of corn, for turnover of about $US 1 million. His warehouse holds 100,000 bags. The biggest farmer he works with has 50 acres. The average acreage of his farmer clients is about 10 acres.
A dealer in Yawksawk trades corn, soybeans, imported seeds, and fertilizer. He sells soy to domestic buyers and corn to China via Muse. His annual trading activities include:

- **Seed**: 120 MT x $US 3,000 per MT = $US 360,000
- **Corn**: About $US 4.2 million total (500 trucks x 40 MT per truck)
- **Soybeans**: 2,000 MT per year
- **Fertilizer**: 80 million Kyat per year

He does not lend to farmers directly or give inputs on credit. He used to do this, but stopped due to bad market conditions. However, he does provide credit to his sub dealers. Of the dealers interviewed, he is the only one who claimed to have a bank loan.

A commodity trader and consolidator in corn and other grains in Taunggyi is also Chairman of the Southern Shan State Chamber of Commerce & Industry.
REFERENCES

USDA Foreign Agricultural Service
“Union of Burma Grain and Feed Annual 2017, GAIN Report BM 7003, 20 April 2017”

USDA Foreign Agricultural Service
“Union of Burma Grain and Feed Annual 2016, GAIN Report BM 6002, 29 April 2016”

The World Bank
“Myanmar: Analysis of Farm Production Economics, 26 February 2016”

Field Corn in Myanmar
“Union Data, Updated 31 March, 2015”

Myanmar Ministry of Agriculture & Rural Development
(Mandalay prices).

The World Bank
“DataBank – Global Economic Monitor (GEM) Commodities (world corn price data)”
CONTRIBUTORS

AgriSource:
Joel Woodward
Tim Welsh

Aye Moe Pwint Phyu
Chit Suu Win Htein