

The Republic of the Union of Myanmar

**Preparatory Survey
on
Two-Step Loan Project for Agriculture
and
Rural Development in the Republic of
the Union of Myanmar**

Final Report

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Japan International Cooperation Agency (JICA)

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EXECUTIVE SUMMARY

1. Agriculture in Myanmar

The Government of Myanmar is at this moment facing critical decisions that will determine the future direction of agriculture. Myanmar's agricultural potential is enormous, given the country's resource endowments as well as its favorable geographic location in the Greater Mekong Subregion, which places Myanmar advantageously between two huge markets, India and China. Good access to the buoyant market of Gulf countries is an additional feature. Despite these advantages, however, Myanmar's agriculture has underperformed over a long period of time. Today, two-thirds of the population of Myanmar is primarily engaged in agriculture but about one quarter of the population still falls below the national poverty line. What are the major reasons for the poor performance of Myanmar's agriculture? Most recent research points out issues with skewed land distribution, poor water control systems, expensive transportation, weak rural and agricultural financing, unpredictable government policies, low public investment in agriculture and weak extension service to farmers.

2. Purpose of this Study

The purpose of this study is, firstly, fact-finding concerning the current general situation of agriculture in Myanmar, taking into account the major issues raised by international literature, secondly, to identify rural and agricultural financing needs that must be addressed to ensure the sustainable development of Myanmar's agriculture, and thirdly, to present a draft project framework for the two step loans (TSL) which we anticipate that JICA will provide to address the needs of farmers and other agricultural entities. Substantial research has been undertaken as part of this study, in close collaboration with the Government of Myanmar, including the Ministry of Agriculture and Irrigation (MOAI), the Myanmar Agricultural Development Bank (MADB) and many others.

3. Rural and Agricultural Financing

Myanmar's financial sector is still small and undeveloped. In addition, the formal rural financial sector is far more undeveloped than the financial sector as a whole. MADB is the only major financial institution in this sector. MADB is owned and supervised by MOAI, which has a jurisdiction covering the development of agriculture, rural enterprises, and related issues. One of the key issues which MADB has encountered for a long period of time is the shortage of funds for agricultural loan provision.

4. Proposed Two Step Loans

In the process of this study, the study team found that (a) farmers and agribusiness companies experience difficulties in accessing medium- to long-term financing due to factors including a

shortage of funds available from financial institutions such as MADB and other banks, (b) smaller farmers have more serious difficulties in accessing short-term financing for purchasing agricultural inputs, (c) the quality of MADB's financial services needs upgrading in areas that include loan processing, access to MADB branch offices, and assessment of eligibility of borrowers, and (d) there are large financial needs for medium- to long-term financing for farm mechanization, i.e., needs to purchase agricultural equipment. As one of concluding remarks, the study team makes a recommendation that the TSL's borrowers should be farmers and agribusiness companies needing medium- to long-term financing in order to achieve farm mechanization and meet related targets.

As part of a solution to these issues, a "two-step loan" project is proposed. The borrower shall be the Ministry of Finance. The Study Team recommends that MADB shall be the Executing Agency. Also, as the selected participating financial institution (PFI), MADB shall handle lending procedures for end-users in the TSL scheme. For the implementation of the TSL Project, the Project Implementation Unit will be established at MADB.

The Study Team recommends that the total TSL amount should not be too large at the initial stage, but that later JICA should consider increasing the total loan amount depending on actual sub-loan disbursement and the actual financial demand in Myanmar.

The sub-loan financial conditions should be determined with consideration for the fact that the TSL is categorized as a policy-based loan. Consequently, the financing scheme needs to achieve policy goals (i.e. enhancement of agriculture and agribusinesses, farming mechanization & modernization) by providing preferential conditions including lower interest rates and relaxed collateral conditions. The recommended terms and conditions of sub-loans are as follows:

- 1) Types of investments to be financed: purchasing of farming machinery, investments for agribusiness production (e.g. machinery, cultivation rights for farming land/land use rights & buildings).
- 2) Maximum financing:
 - Farmers: MMK 50 million
 - Agribusinesses: MMK 500 million
- 3) Approval authority for each sub-loan: Loan Department of MADB (in accordance with the practice applied by MADB in the case of its "Term Loan")
- 4) Currency: Myanmar kyat (MMK)
- 5) Interest rates: 8.5% per annum
- 6) Maturity and grace period: The sub-loan maturity shall be 1 to 5 years, and the grace period shall

not exceed 1 year.

- 7) Repayment schedule: The principal and interest shall be repaid every 6 months.
- 8) Collateral and guarantor: In principle, this condition shall comply with the relevant instructions of CBM, banks' general practices and MADB's practice, but some relaxed conditions could be adopted in the TSL project.
- 9) Documents required from loan applicants: Requirements for documents shall comply with the current practice of the PFI. For example, farmers who apply for a MADB loan are required to submit a land certificate issued by MOAI-LRD (Land Registration Department) to MADB.
- 10) PFI risk: As a PFI, MADB will bear the end-user credit risks.

It should be emphasized that the project scheme presented here is merely a proposal by the Study Team. The ultimate implementation structure of the project will be determined through bilateral discussion.

5. Policy Recommendations

In Myanmar's banking sector, including MADB, it is difficult to secure enough funds to provide medium- to long-term financing. The overall shortage of funding at MADB affects end-users' satisfaction with the financial services provided by MADB. Therefore, the Study Team recommends that the TSL project should focus on supporting the provision of medium- to long-term financing for farm mechanization.

The study team makes the following recommendations as concluding remarks to provide focus for the forthcoming TSL discussion:

(A) Human resources development

Human resources development in Myanmar is important and essential to ensure efficient operation of the TSL project at the level of sub-borrowers' services and extension services, in addition to providing consulting services for the Project Implementation Unit of MADB.

(B) Sub-borrowers

The study team is proposing launch of a project entitled "the Project related to the Improvement of Agricultural Productivity in the Designated Areas Supported by the Proposed TSL for Agriculture and Rural Development in Myanmar" The designated areas should be: (1) Shan State, (2) the Central Dry Zone, and (3) the Ayeyarwady Delta region. Improvement of agricultural productivity in these areas can be achieved by introducing agricultural machines purchased with loans provided under the proposed TSL scheme.

(C) Collaboration with the Private Sector

As much literature relating to agribusiness points out, giving consideration to the total value chain of agricultural products is the most important issue when discussing agricultural development and its sustainability for developing countries. For agricultural products such as paddy/rice, there needs to be consideration of a project's impact on the transformation of the specific product's value chain, including the upstream (inputs, farmers and organization of production units), midstream (milling, processing and wholesaling), and downstream (retailing and international trade) parts of the chain. Therefore, from the viewpoint of their importance in the value chain, agribusiness companies should be considered as candidates for TSL project end-users/sub-borrowers.

(D) Publicity of TSL Availability

In order to communicate TSL availability to potential end users in rural areas of Myanmar, it is proposed that consideration should be given to publicity or advertising through MOAI newsletters, TSL pamphlets, advertisements in local newspapers, and TV and/or radio broadcasts. This would be in addition to announcements on MOAI's or MADB's website. The aim would be to easily and reliably communicate information about the loans to the large portion of farmers who are not regular users of computers and who do not have easy access to announcements on official websites. Moreover, it is suggested that the information could also be communicated through farmers' gatherings, including seminars held by private sectors entities such as the Myanmar Paddy Producers Association (MPPA).

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Abbreviations

ADB	Asian Development Bank
ALCO	Asset Liability Management Committee
AMD	Agricultural Mechanization Department
BDS	Business Development Service
BOD	Board of Directors
BTMU	The Bank of Tokyo-Mitsubishi UFJ
CAR	Capital Adequacy Ratio
CBM	Central Bank of Myanmar
CDZ	Central Dry Zone
CEC	Crop Exchange Center
CMB	Central Bank of Myanmar
CSO	Central Statistical Organization
DOA	Department of Agriculture
DTP	Department of Trade Promotion
GTB	Global Treasurer Bank
GIZ	Gesellschaft für Internationale Zusammenarbeit
ICDP	Integrated Community Development Project
ID	Irrigation Department
IMF	International Monetary Fund
INGO	International Non-governmental Organization
LIFT	Livelihoods and Food Security Trust Fund
MADB	Myanma Agricultural Development Bank
MATP	Myanmar Agricultural Produce Trading
MBSC	Microfinance Business Supervisory Committee
MD	Managing Director
MEB	Myanma Economic Bank
MF	Microfinance
MFI	Microfinance Institution
MLT	Medium-to long-term
MMK	Myanmar kyat
MMSE	Myanma Microfinance Supervisory Enterprise
MNGO	Myanmar Non-governmental Organization
MNPED	Ministry of National Planning and Economic Development
MOAI	Ministry of Agriculture and Irrigation
MOF	Ministry of Finance
MOI	Ministry of Industry
MOLF	Ministry of Livestock and Fisheries
MOU	Memorandum of Understanding

NPL	Non-performing Loan
MPPA	Myanmar Paddy Producers' Association
MRPTA	Myanmar Rice & Paddy Traders' Association
PGMF	PACT Global Microfinance Fund
PFI	Participating Financial Institution
PIU	Project Implementation Unit
ROA	Return on Assets
ROE	Return on Equity
SMIDB	Small & Medium Industrial Development Bank
SLRD	Settlement and Land Record Department
SOE	State-owned Economic Enterprise
SRG	Self-Reliance Group
TA	Technical Assistance
TSL	Two-Step Loan
UMFCCI	Union of Myanmar Federation of Chambers of Commerce & Industry
UNDP	United Nations Development Programme
UNOPS	United Nations Office for Project Services
USAID	U.S Agency for International Development
WRUD	Water Resources Utilization Department
viss	Weight unit in Myanmar (1 viss = approximately 1.64kg)

CHAPTER 1 OVERVIEW OF THE STUDY

1. Background and Objectives

1-1. Background of the Study

Agriculture accounts for 30% of Myanmar's GDP and 61.2% of the population works in the agricultural sector (source: Myanmar Ministry of Agriculture and Irrigation, 2012). Furthermore, approximately 70% of the population resides in rural areas where agriculture is the primary source of jobs. Due to the importance of agriculture in Myanmar, the government led by President Thein Sein has positioned agriculture and rural development as a key element of economic reforms. One part of these development activities is an agricultural financing scheme at the Ministry of Agriculture and Irrigation (MOAI) to assist farmers.

However, there is a shortage of funds at Myanma Agricultural Development Bank (MADB), a unit of MOAI that extends loan to farmers. There are also issues involving capabilities needed for the loan approval process.

For these reasons, there is a need to provide small loan services on a medium to long-term basis to end-users by extending two-step loans (TSL) for agriculture and rural development. The Study Team is proposing the collection of information and study analysis for making these loans possible.

In addition, end-users/sub-borrowers must be given the agricultural management skills needed to enable them to repay these agricultural loans. There is also a need for participating financial institutions (PFIs) to devise a framework that creates an environment in which non-performing loans will not be a serious problem. A study of candidate PFIs will be performed that includes determining how much expertise these institutions currently have for the creation of this framework.

Extending loans to farmers does not use the same logic as loans for small and medium-sized enterprises (SME). Agricultural loans are likely to involve almost entirely borrower-side risks. Examples are risks associated with weather and other forces of nature. This creates the problem of what type of institutions would guarantee the repayment of loans. Another issue is how to create a TSL scheme that preserves transparency along with equality between the end-users/sub-borrowers (farmers) and lenders (PFIs).

This study aimed to consider the feasibilities of TSL for agriculture and rural development in Myanmar.

1-2. Objectives of the Study

(1) Objectives of the Project

The purpose of this study is to create a proposal for a framework for supporting the medium and long-term development of agricultural and rural villages through financial support. This is accomplished by building an efficient system for the TSL project in order to supply funds to the agricultural sector, which accounts for 30% of Myanmar's GDP. Currently, in principle, regulations allow banks in Myanmar to extend loans only when these are secured by real estate. Loan applications are rarely examined based on a business plan. As a result, companies with no land and companies that have submitted all their land as collateral are unable to obtain loans or additional loans. Implementing an effective TSL project in the agricultural sector will require reinforcing as much as possible three capabilities of banks that will be PFIs for the two step loans: credit appraisal skills, loan management skills and loan collection skills. To accomplish this, the Study Team considered collaboration with the business training program and other programs of the Myanmar-Japan Center for Human Resources Development, based as well on the technical cooperation that will be needed.

(2) Procedures of the Project

a) Cooperation with other donors for implementing associated projects

The Study Team surveyed programs of other donors to determine the status of these programs and identify any problems. At the same time, to establish the proposal for implementing the TSL project, the Study Team avoided providing support that overlaps those of other organizations. Our objective was to study and examine ways that the TSL project could be used effectively to provide medium and long term financial support for the development of agriculture in Myanmar.

b) Precautions as materials for consideration of an ODA loan

An examination for extending an ODA loan was performed based on the results of this study. The Study Team held extensive discussions with JICA concerning the plan for this study so that results could be reflected in part of the proposal for an ODA loan project. At the same time, the Study Team achieved a sufficient consensus with related agencies of the Myanmar government to focus on creating practical and concrete proposals.

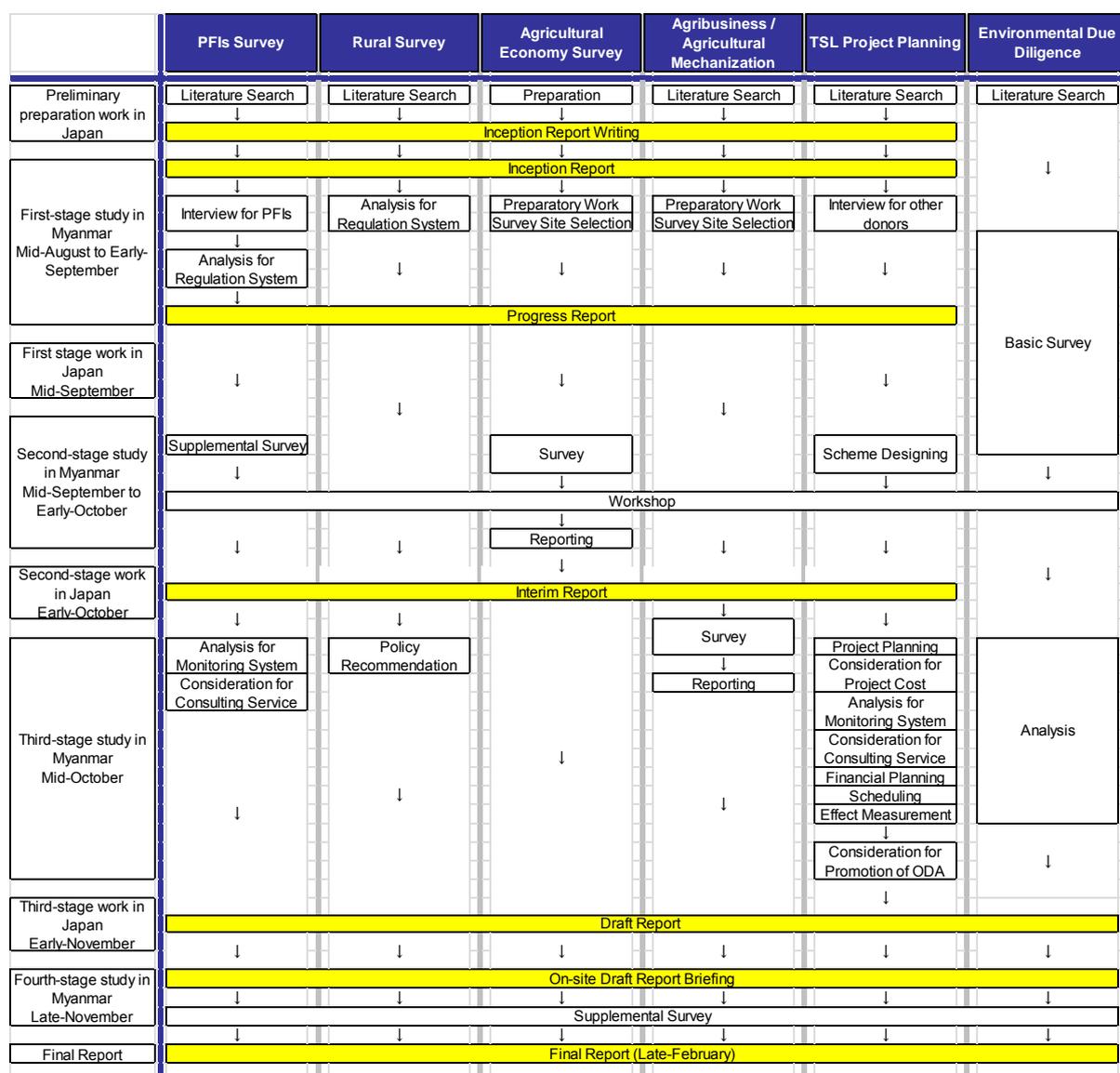
When performing this examination, the Study Team was aware that a conclusion that differs from the result of the study may be reached. For the collection of information from sources in Myanmar, the Study Team explained that this study was performed on a non-committal basis and obtained the understanding of respondents.

2. Methodology of the Study

2-1. Project Flow

The activities in this project were divided into five categories: PFIs survey, rural survey, agricultural economy survey (Farm Household Economy Survey), study for agribusiness/agricultural mechanization, TSL project planning, and environmental due diligence. Each study was performed in nine steps extending from the preparatory survey in Japan to the final reporting in Japan.

The Study Team conducted this survey by using the procedure shown in the following flowchart for study operations.



Source: The Study Team (November 2013)

Figure 1-1. Flowchart of the Study

The study in Myanmar included visits to counterparties in the country, including the Budget Department of the Ministry of Finance (MOF). The Study Team also visited the Union of Myanmar Federation of Chambers of Commerce & Industry (UMFCCI), the Myanmar Banks Association, and candidate banks for PFIs. The Study Team conducted interviews at MADB, which plays a primary role in agricultural financing, and at the Small & Medium Industrial Development Bank (SMIDB), which plays a primary role in SME financing. At MADB, the Study Team clarified from the user side of the farmer and rural village study the status of Seasonal Loans¹, which account for 90% of MADB's loans, and the reason that Term Loans², which are similar to TSL, account for only 10%. The organizations selected for the survey were as follows: Budget Department of MOF, Central Bank of Myanmar, MOAI, MADB, SMIDB, Global Treasure Bank, Myanmar Banks Association, and UMFCCI.

2-2. Study Implementation Method in Each Study Period

(1) Preliminary preparation work in Japan

a) Collection, organization and analysis of existing materials

First of all, the Study Team collected a broad range of materials about Myanmar that include JICA reports, documents of various research institutes and literature reports.

b) Determination of study goals, plan, study method and work plan and discussions with JICA

After setting overall goals of the study, the study method and the study process, the Study Team held discussions with the Southeast Asia and Pacific Department of JICA to finalize these matters.

c) Inception report preparation, explanation and discussions

The Study Team submitted an inception report after completing the above steps a) and b).

(2) First-stage study in Myanmar

a) Explanation of survey purpose and plan for operations to organizations involved

The Study Team held discussions with the JICA Myanmar Office, MOAI, MOF, and other organizations. At the same time, the Study Team held discussions with candidate PFIs.

b) Meetings with candidate PFIs

¹ Seasonal loans are short term loans for the cultivation of major crops, such as rice, pulses, and maize etc.

² Term loans mean loans given for capital investment including agricultural machinery.

The Study Team made meetings with candidate PFIs about the following points.

- **Organizational structure, financial structure and fund procurement**
- **Loan schemes, interest rate structure, standards for requiring collateral and guarantees**
- **Credit investigation procedures and expertise**
- **Corporate governance, analysis of problems involving systems**
- **Status of assistance from other donors, other subjects**

c) Confirmation of activities involving agriculture and rural development and analysis of issues

This study entailed discussions with MOAI. The Study Team also verified the following points by taking into account user-side opinions obtained from farmers. To perform the study efficiently, the Study Team used existing surveys, documents and other information as much as possible.

- **Status of agricultural and rural village development and issues, positioning of financing**
- **Current use of agricultural and rural village development loans, collection of information**
- **Assistance provided by other donors**

d) Selection of townships and villages for the Farm Household Economy Survey

The Study Team selected townships and villages based on a wide range of opinions obtained from the MOAI as well as many other organizations by using the above steps b) and c) after holding discussions with JICA.

e) Start the Farm Household Economy Survey

For the Farm Household Economy Survey, the Study Team conducted the study in two regions: the Bago Region and Shan State. The Study Team also obtained the results of Sanyu Consultants' Farm Household Economy Survey in the central dry zone³.

For this study, the Study Team selected samples consisting only of farmers with a right to grow crops. The Study Team avoided selecting landless farm households. Every village has a leader for each 10 households and a leader for each 100 households. These leaders are either contact farmers with medium-scale operations or highly skilled farmers. They have more financial ability than ordinary farmers and some are also leaders in using advanced technologies to grow crops. The Study Team asked agricultural extension centers and the leaders of villages for introductions to these contact farmers, who were engaged mainly in growing crops. The Study Team chose samples from three categories: small farmers with under 5 acres, midsize farmers with 5 to 10 acres, and large farmers (including contact farmers) with more than 10 acres.

³ Sanyu Consultants conducted several studies in the Central Dry Zone.

f) The survey for agribusiness /agricultural mechanization

To perform the study efficiently, the Study Team assigned local consultants.

(3) The first-stage work in Japan

a) Preparation of progress report and explanation to related organizations

The Study Team submitted the progress report as the basis for discussions with JICA concerning the study's progress, the plan for the second-stage study in Myanmar.

b) Preparation of plan for the second-stage study in Myanmar and discussions with JICA

(4) The second-stage study in Myanmar

a) Analysis of the farm household economy and agribusiness/agricultural mechanization surveys

Data obtained from the Farm Household Economy Survey and agribusiness/the agricultural mechanization survey were collected and analyzed.

b) Workshop

A workshop attended by officials of the Myanmar government was held to exchange thoughts regarding to the study results at this point and to discuss goals and plans for upcoming studies.

c) Consideration for the TSL project scheme

The Study Team considered the TSL project with a focus on the following points. This consideration incorporated results of the first-stage study and results of the Farm Household Economy Survey as well as the survey for agribusiness/agricultural mechanization.

- Establish proposed standards for individuals eligible to receive loans
- Establish standards for candidate intermediary financial institutions
- Create a general scheme (including the consideration of government guarantees)
- List candidates for financing and examine the general characteristics of borrowers

(5) The second-stage work in Japan

a) Preparation of interim report and explanation to related parties

The Study Team held the necessary discussions about the progress with the survey, the plan for the third-stage study in Myanmar.

b) Preparation of the third-stage study in Myanmar and discussions with JICA

(6) The third-stage study in Myanmar

a) Preparation of a project plan

The Study Team used the survey results up to this point to prepare a project plan that clarifies the following points.

- **Details of the scheme (intermediary loan terms and conditions, exposure to foreign exchange risk, etc.)**
- **Loan terms of PFIs for end-users/sub-borrowers**
- **Establishment and management of special account for repayments**
- **Designation of model cases, etc.**

b) Consideration for ODA loans

The Study Team used results of interviews to learn the activities of other donors. The Study Team then considered overall expenses for this project and the required scale of ODA loans based on progress with these activities, lessons learned, the ability to perform these projects (credit investigation system, etc.), and the need for public-sector support.

c) Conformation of project implementation and monitoring system

Project implementation: Confirmation of financial condition of selected PFIs, existence/possibility for investment function, credit investigation skills (system, approval decisions and standards, process), loan experience (approvals, loans extended, repayments), and characteristics and outline of loans to end-user/sub-borrower.

Monitoring: In accordance with the project plan explained above, the Study Team confirmed the monitoring method for end-users/sub-borrowers of selected PFIs. The Study Team also determined the areas where technical assistance is needed for upgrading capabilities.

d) Consideration for consulting services

For the consulting services for this project, the Study Team determined the items at each stage that required upgrading the skills of selected PFIs or strengthening the organizations and supporting business operations of end-users/sub-borrowers. This was used to prepare a TOR preliminary proposal. Sanyu Consultants had performed work for the government of Thailand concerning the Agricultural Loan Program (Project for Promotion of Export-oriented Agricultural and Fisheries Production) at the Bank for Agriculture and Agricultural Cooperatives. The Study Team performed a review based on the consulting activities, contract and report for this project.

e) Preparation of funding demand plan

Based on the results of the fund demand analysis to be confirmed by this project, after holding

discussions with associated Myanmar institutions, the Study Team prepared a funding demand plan. The plan incorporated overall expenses, the composition of funds for lending and anticipated progress regarding the business plan.

f) Consideration for the implementation schedule

The Study Team prepared a proposal for a schedule for conducting this project that reflects the following items.

- **Consider a study about the schedule of the part of the business plan (proposal) that involves ODA loans**
- **Prepare an action plan that includes the organizations, time period and confirmation method for implementation**
- **Milestones for the consultant selection process, determination of necessary number of days and incorporation in the schedule**

g) Consideration for project effect evaluation

The Study Team performed a thorough overall examination of the project with regard to the detailed plan that has been formulated up to this point. The Study Team determined the beneficiaries of this project and established performance indicators for the direct and indirect measurement of benefits. Information and data needed to establish quantitative indicators were obtained and the Study Team established and proposed precautions and evaluation methods for project evaluations. For the confirmation of qualitative benefits, the Study Team established and proposed suitable benefit indicators and confirmation methods. When establishing both operational and benefit indicators, the Study Team aimed to create realistic indicators and targets with regard to validity, reliability and accessibility.

h) Environmental due diligence

Myanmar is currently in the process of establishing laws and regulations concerning environmental issues. Therefore, the Study Team believes that it will be vital to perform this study while using the latest information about these laws and regulations.

i) Preparation of suggestions

After performing a comprehensive reconfirmation of study results up to this point, the Study Team summarized our suggestions concerning improvements and upcoming actions involving financing for agriculture and rural development. These suggestions are not be limited to improvements to systems.

j) Examine ways to publicize this project to end-users/sub-borrowers

The Study Team considered activities for advertising the project.

(7) The third-stage activities in Japan

- a) Prepared draft final report and explain the report to related parties
- b) Established a plan for the fourth-stage study in Myanmar and hold discussions with JICA

(8) The fourth-stage study in Myanmar

- a) Workshop for the draft final report

The Study Team invited government officials to attend a workshop where the Study Team exchanged thoughts about the contents of the draft of the final report. The Study Team invited mainly people from ministries and agencies associated with agriculture and finance. The Study Team made further decisions about this workshop based on the status of this project after the third-stage study.

- b) Summarize remarks for the draft final report

The Study Team collected remarks for the draft final report from government officials in Myanmar.

(9) Finalization period in Japan

- a) Preparation of final report

The Study Team made revisions as needed based on remarks that the Study Team received for the draft final report and then submitted the final report after discussions with JICA.

- b) The final report

The Study Team submitted the final report to the Southeast Asia and Pacific Department of JICA.

CHAPTER 2 AGRICULTURAL SECTOR IN MYANMAR

1. Agriculture in Myanmar

1-1. Agricultural Sector in GDP

Economy in Myanmar, in the past and present, has been heavily depending in agricultural sector. GDP of agricultural sector occupies 47.9% of national GDP in 2009. Considering that 68% of working population is engaged in agricultural sector, the agricultural sector has strong influence to national economy as basic industry of the country.

Table 2-1. Share of Agriculture in GDP in Selected Asian Countries, 1970-2011

Country/Year	1970	1980	1990	2011
Singapore	2.2	1.3	0.4	0.0
Hong Kong	n.a.	0.8	0.3	0.1
Taiwan, China	n.a.	7.7	4.2	1.7
Rep. of Korea	29.8	14.9	8.5	2.7
China	2.2	30.1	27.0	10.1
Thailand	30.2	23.2	12.5	10.9
Malaysia	n.a.	22.9	15.2	12.0
Sri Lanka	30.7	26.2	22.9	12.1
Philippines	28.2	25.1	21.9	12.8
Indonesia	35.0	24.8	19.4	14.7
India	44.5	38.1	31.0	17.2
Bhutan	n.a.	56.7	43.2	17.5
Bangladesh	n.a.	41.2	29.4	18.3
Pakistan	40.1	29.6	26.0	21.0
Viet Nam	n.a.	50.0	38.7	22.0
Lao PDR	n.a.	n.a.	61.2	30.3
Myanmar	49.5	46.5	57.3	34.7
Cambodia	n.a.	n.a.	55.6	36.7
Nepal	n.a.	61.8	51.6	36.9

Source: Investment Policy Review, Myanmar Preliminary Findings (OECD, 2013)

Table 2-2. GDP Share and Annual Growth Rate by Agricultural Sub-sector, 2006-2010

(%, 2005-06 constant producers' prices)

Year	Agriculture (Crops)		Livestock and Fishery		Forestry	
	Share	Growth rate	Share	Growth rate	Share	Growth rate
2006-07	37.0	9.2	7.6	12.2	0.6	8.3
2007-08	35.6	7.5	7.5	10.9	0.5	0.3
2008-09	33.8	4.8	7.5	10.1	0.5	-2.3
2009-10	31.9	4.2	7.6	12.3	0.4	-3.1
2010-11	30.0	4.1	7.4	7.5	0.4	0.3

Source: Investment Policy Review, Myanmar - Preliminary Findings (OECD, 2013)

Under the present administration, which started in March 2001, agriculture is defined as “base of all industries”. The Ministry of Agriculture and Irrigation (MOAI) plays an important role and is expected to implement research and development for the improvement of quality and increase of production volumes.

1-2. Agricultural Production

(1) Rice

Planted area of rice, a major crop in Myanmar, in 2003/2004 and 2010/2011 by Region/State is as follows:

Table 2-3. Planted Area of Rice, 2003/2004 – 2010/2011

Region/state	Planted area (⁰ 00 ha) 2003/2004	Planted area (⁰ 00 ha) 2010/2011	Growth rate 2003-2010 (%)	Average annual change (%)
Kachin	166.33	267.10	60.58	8.65
Kayah	31.97	45.33	41.77	5.97
Kayin	194.25	274.79	41.46	5.92
Chin	44.11	56.25	27.52	3.93
Sagaing	693.24	928.56	33.80	4.83
Tanintharyi	123.03	150.55	22.37	3.20
Bago (E)	652.15	799.27	22.75	3.25
Bago (W)	435.86	591.45	35.47	5.07
Magway	244.84	426.55	74.21	10.60
Mandalay	324.16	391.53	20.47	2.92
Mon	313.64	407.53	29.94	4.28
Rakhine	394.17	501.01	27.10	3.87
Yangon	566.17	56.74	0.43	0.06
Shan (S)	181.30	258.20	42.41	6.06
Shan (N)	176.85	198.30	12.13	1.73
Shan (E)	90.25	167.54	85.65	12.24
Ayeyarwady	1,912.78	2,022.66	5.80	0.83
Total	6,545.10	8,050.35	23.00	3.29

Source: Myanmar Agricultural Statistics, 2011

(2) Other Crops

From the viewpoints of domestic consumption needs and acquisition of foreign currencies, 10 target crops are selected. Table 2-4 shows the balance between present yield and targeted yield of these prioritized crops in 2010-2011.

Table 2-4. Balance of Present Yield and Targeted Yield (ton/ha)

Crop	Present Yield	Targeted Yield	Balance
Sugarcane	62.03	75.32	-13.29
Long Staple Cotton	1.63	1.61	+0.02
Maize	3.61	4.93	-1.32
Ground Nut	1.58	1.40	+0.18
Sesame	0.55	1.21	-0.66
Sunflower	1.59	1.79	-0.20
Black Gram	1.26	1.61	-0.35
Green Gram	1.22	1.61	-0.39
Pigeon Pea	1.32	2.02	-0.70

Source: MOAI (Present Yield), Myanmar Agriculture in Brief 2012 (Targeted Yield)

To achieve the targeted yields, efficiency in providing agricultural inputs (ex. fertilizer) and crop breeding are necessary. However, considering the limited financing to farmers and government investment, it is difficult to secure adequate input for these requirements for these selected crops.

Research and development of crop breeding are in progress. Farmers understand the importance of crop breeding to improve productivity, but still many constraints exist in extension of seed breeding. In addition to agricultural inputs, an adequate supply of irrigation water and programs for seed breeding are necessary to achieve targets.

For this purpose, MOAI is presently taking the following actions necessary to achieve these targets:

- 1) Introduction of seed breeding which can apply to each State/Region
- 2) Supply of fertilizer in appropriate amounts
- 3) Effective insect/pest management
- 4) Effective and applicable farming technology
- 5) Establishment of cropping patterns suitable for the local conditions

1-3. Export of Agricultural Products

As policies to promote imports and exports of Myanmar's agricultural products, the Government abolished export tax on agricultural products, import tax of agricultural inputs such as farm machinery, fertilizer and pesticide, allowed the free trade of products, and also established various associations to support the exportation of products. Also, implementation rules and regulations of the Export Import Law are being drafted by the Ministry of Commerce.

For these purposes, the Department of Trade Promotion (DTP) was established in April 2013 by restructuring Myanmar Agricultural Produce Trading (MATP) to unify the activities promoting export of agricultural products. DTP actively participates in international exhibitions hosted by foreign institutes such as ASEAN-Japan Center and ASEAN-Korean Center, and is also conducting trade fairs and business matching in collaboration with UMFCCI.

Export tax on agricultural products was reduced from 10% to 7% in June 2001 and further reduced from 7% to 2% in August of the same year. As of July 2013, export tax has been abolished, according to information from DTP, while exports of some products such as rubber, cotton, lacquer and leather are still subject to export tax. Import tax of farm machinery (as long as imported for agricultural use) and seeds are also abolished, although 5% commercial tax is still imposed.

Information at DTP also indicates achievement of free exportation of major oil crops such as sesame, groundnuts and also legumes. Export permissions are no longer necessary, but pre-shipment

inspections are required. For the import of fertilizers and insecticides which were under governmental control till 1995 and 2003 respectively, permission is not required at present, but a quality certificate issued by MOAI is necessary.

Table 2-5 below shows export volumes of major crops from 1995 to 2012. Major grains for exports are rice and maize (mainly for animal feed), while major legumes are black gram, green gram, pigeon pea and chick pea. Oil crops such as sesame and niger are also commonly exported.

Table 2-5. Export of Agricultural Commodities

('000 Ton)

	Crops	1995/96	2000/01	2005/06	2008/09	2009/10	2010/11	2011/12
1	Rice	354.0	251.4	180.0	666.4	818.1	536.4	707.2
2	Maize	62.0	147.9	90.0	120.3	10.4	44.8	166.5
3	Black Gram	185.0	274.6	379.6	529.7	615.8	456.5	598.1
4	Green Gram	185.9	186.0	174.1	264.8	303.6	166.3	229.0
5	Other Pulses	238.7	370.7	323.8	656.8	312.5	206.6	469.3
6	Sesame Seeds	50.3	34.4	21.5	19.5	24.4	29.5	35.5
7	Niger Seeds	-	14.1	0.3	4.7	4.8	-	-
8	Onion	-	57.5	24.3	18.4	2.7	-	1.1
9	Tamarind	-	3.2	7.1	25.5	14.5	5.6	17.2
10	Oil Cakes	31.1	0.4	-	-	-	-	-
11	Raw Rubber	24.8	20.4	29.3	13.6	41.1	46.5	33.6
12	Sugar	-	3.2	1.0	8.7	58.3	-	-

Source: Central Statistical Division, Ministry of Planning and Economic Development

2. Agricultural Modernization

2-1. Policies, Objectives and Strategies of Agricultural Development

The objectives of the agricultural policies of Myanmar are primarily to fulfill the needs of local consumption as a priority, export more surpluses of agricultural products to increase earnings and ensure rural development through agricultural development. The implementation of these policies is the responsibility of Ministry of Agriculture and Irrigation (MOAI) under the laws of Myanmar. Under these policies, MOAI is attempting to realize the increase of crop production so as to increase farmers' incomes, and these are considered the organizational objectives of MOAI. Additionally, state strategies for agricultural development have been recognized to include development of new agriculture land, provision of sufficient irrigation water, realization of agricultural mechanization, application of modern agro-technologies and development and utilization of modern varieties.

2-2. Productivity Improvement by Agricultural Mechanization

As stated in the abovementioned strategies, agricultural mechanization is clearly described as one of the major constraints to be tackled for agricultural development in Myanmar. With respect to the improvement of productivity through agricultural mechanization, the Myanmar Rice Federation stated that an export target of 3 million MT is achievable by 2017 if efforts are made for improvement of productivity by mechanization at three levels of the rice value chain: (1) improving farm-level productivity (Upstream level), (2) improving off-farm processing and handling (Midstream level), and (3) improving export market competitiveness⁴. In other words, these issues can be described as on-farm and off-farm post-harvest handling and processing, which occurs on-farm or off-farm within the value chain (Downstream level)⁵.

2-3. Mechanization in the Value Chain

For rice farmers, investment in post-harvest machines can reduce field and household losses and enhance milling recovery and grain quality. There is no doubt that the use of agricultural machines needs to increase for the improvement of productivity. In the case of rice production, agricultural machines that need to be introduced in the upstream level are, amongst others, equipment for harvesting and threshing as well as for drying and storage. Irrigation equipment, ploughs, thrashers, tractors and others will lead to increases in productivity, whether farms are small or large. Secondly, the main machine to be introduced in the midstream and downstream level is said to be mills, the size of which is required to be suitable to the specific village or town's market needs from the viewpoint of the development of value chain. Generally speaking, although there are significant investments in various stages of the rice value chain, it is obvious that milling or processing machines tend to become one of the major investment targets in the rice value chain, since the milling segment is currently becoming the focal point for linking the upstream segment of farming to the downstream segment of wholesaling, retailing and export. That is, in the transformation of the traditional rice value chain, it should be said that the milling company has a substantial possibility of taking the leading role for rice production and marketing in the entire rice value chain.

2-4. Lack of Equipment Finance

Rural financial sector in Myanmar is undeveloped and access to agricultural production and marketing credit is almost non-existent. At this point of time, loans for the agricultural machines and related equipment are mainly provided by Myanma Agricultural Development Bank (MADB) and other banks as well as private sector companies selling such machines.

⁴ Denning, Glenn, Kye Baroang, Tun Min Sandar and other MDRI and MSU colleagues (2013) "Rice Productivity Improvement in Myanmar" Background Paper No.2. Michigan State University. P.4 and P.5.

⁵ Modernization of the value chain of agricultural products is recently one of the focal points for agriculture development in the south-east Asia and probably in other parts of world.

However, the amounts of funding available are so limited and high collateral is usually required⁶. The most common collateral is land or other type of real estate. As a matter of fact, except for large trading or agriculture related companies, formal credit is largely unavailable to almost any farmer. In addition, there exist Specialized Agricultural Development Companies to provide loans to farmers in every parts of the country, the establishment of which has been encouraged since 2009. These companies are typically owned by large trading companies and large millers. Unfortunately, their loans to farmers are in fact restricted to agriculture inputs, and these loan contracts usually include supply and buyback arrangements⁷. Thus, it can be said that there is no loan available to farmers at this moment to purchase agricultural machines and equipment. In other words, there are hopes that MADB will improve the service quality to provide medium- to long-term finance for purchasing agricultural machines and equipment.

3. Agricultural Financing on Agricultural Policy

3-1. Action Plan for Rural Development and Poverty Alleviation

At the national level workshop held on 20-21 May 2011, the President announced primary policy on agricultural development by defining the agricultural sector as the major motive power of the national economy, and announcing prioritization of the development of agricultural sector, livestock and fishery sector, food security from climate change, improvement of farm income as well as poverty alleviation. Based on this policy, the Ministry of National Planning and Economic Development established the Central Committee of Rural Development and Poverty Alleviation. Accordingly, Working Committee and Sub Committee were established in Region/State level.

Objective of Action Plan:

In accordance with Millennium Development Goal, effective and efficient implementation of agricultural development and poverty alleviation shall be made to half poverty incidence by 2015.

3-2. Agricultural Sector 5th 5-Year Plan (2011/12-2015/16)

Based on the Action Plan for Rural Development stated above, MOAI defined short-term (5 years) development strategy at the national level workshops in July and November 2012, designating it the

⁶ Although MADB provides “term loan” as medium- to long-term finance for capital investment including agricultural machinery, at the present time the term loan scheme has been suspended due to the limited fund.

⁷ Kloeppinger-Todd, Renate and Tun Min Sandar (2013) “Rural Finance in Myanmar” Background Paper No.3. Michigan State University. P. 14.

Agricultural Sector 5th 5-year plan from 2011/12 to 2015/16.

In this plan, based on the achievement status of 2010/2011, annual growth rate of GDP is estimated as 1.8% during the 5th 5 years plan. MOAI set the following policies, objective and targets and programs to sustain economic development.

Policies:

- Introduction of high-yield crops and high quality seeds in each Region/State
- Capacity development of extension officers and trainings on farming technology
- Implement action plan in research and development for sustainable agricultural development
- Protection of farmers' right and profit
- Support to maintain adequate price of agricultural products
- Support decrease production cost, increase of high-yield crops, establishment and strengthening of new markets
- Support transition from traditional farming to irrigated farming
- Support and contribution to rural development and poverty alleviation

Objectives:

Increase of GDP in agriculture by 1.8%, by the improvement of agricultural productivity

Targets:

- 34.2 million acre as planted area (167% as crop intensity)
- 82.95 basket/acre as rice yield,
- 1,604 million baskets as production amount
- 5.8 million acres as irrigated area
- 14.43 million acres as tillage acre by mechanized farming
- 496,786 million Kyat of agricultural financing

Programs:

- Utilization of high-Yield varieties and good high quality seeds
- Extension of farming technology
- New research and development
- Expansion of irrigated area
- Utilization of farm machineries
- Training of farming technicians
- Agricultural financing
- Proper use of irrigation water, chemical and organic fertilizer
- Improvement of accuracy in agricultural statistics
- Decrease of production cost and trading cost based on supply chain
- Generation of profit and establishment of sustainable markets
- Development of agro-industries
- Promotion of private participation on agricultural production
- Review of laws based on present situation
- Survey on land management
- Capacity building by local authority and international organizations, establishment of efficient organizations

Among domestic financial institutions in Myanmar, there are two banks of which the major purpose of operation is to provide financial services to the agricultural sector: Myanma Agricultural Development Bank (MADB) and Global Treasure Bank (GTB). While most of financial institutions in Myanmar provide services in urban areas, these two banks operate in rural areas by providing financial services to agricultural related entities and individual farmers.

As stated, in the Agricultural Sector 5th 5-Year Plan (2011/12-2015/16), strengthening of agricultural financing is emphasized as one of five prioritized targets. In this plan, The amount of loans made by MADB is targeted to be increased 1.3 times from 2011/12 to 2015/16, as shown in Table 2-6.

Table 2-6. Target Loan Amount by MADB

FY	Target Loan Amount (million kyat)
2011/12	386,225
2012/13	413,920
2013/14	433,418
2014/15	464,753
2015/16	496,786

Source: National Comprehensive Development Plan

For the improvement of farmer's access to financial services, the Government allowed them to avail loans by providing their farmland as collateral under the Farm Land Law in March 2011. The Government increased MADB's maximum loan amount from 20,000 kyat/acre to 100,000 kyat/acre, as compensation for abolishing governmental subsidies on the purchase of seeds and fertilizers.

However, the volume of agricultural financing is still limited and insufficient against the huge needs for finance in the agricultural sector, even though people working in the sector account for more than 68% of the total economic population of the country. This can be also observed on the Farm Household Economy Survey executed during the study that an average production cost of paddy in the three study areas is 189,244 kyat/acre for monsoon paddy and 185,866 kyat/acre for summer paddy, while MADB's maximum loan amount for paddy farmers was only 100,000 kyat/acre.

4. Situation of Agriculture in the Study Areas

4-1. Selection of the Study Areas

To categorize regional agricultural characteristics in Myanmar, MOAI usually adopts a geographical classification, as shown in the table below. Though other practices for classification, such as ecological classification, are also commonly used, classification by geographical characteristics is suitable for adoption to agricultural development planning.

Table 2-7. Zoning of Agricultural Characteristics by Geographical Classification

Geographical Zoning	Agricultural Characteristics
Zone-1 Mountainous Area (Kachin, Kayah, Chin, Shan)	<ol style="list-style-type: none"> 1) High mountains and mountain range, forest area are included 2) Low population density 3) Cultivation is concentrated in valley area, while slash-and-burn agriculture is practiced in mountainous area 4) Large rainfall amount, and rivers run into dry area 5) Forest land is deteriorated due to slash-and-burn agriculture, and suffers from soil erosion, sedimentation and depletion of water resources 6) Soil and terrain suitable for agro-forestry
Zone-2 Central Dry Zone (Sagaing, Mandalay, Magway)	<ol style="list-style-type: none"> 1) Semi-dry and dry area 2) Annual Rainfall is 650 to 1,000mm 3) Paddy plantation by using irrigation water, and also by rainfed field 4) Peanuts and sesame are common products, which grow in sandy soil. Production of sesame depends on rainfall amount. 5) Constraints for agricultural production increase are insufficient organization of farmers, and maintenance of canals 6) Rice shortage occurs in some area
Zone-3 Delta Area (Ayeyarwady, Yangon, Bago)	<ol style="list-style-type: none"> 1) Consists of Ayeyarwady delta and Sittaung delta. 2) Many rivers flow to Bengal Bay in south. Some rivers are tidal rivers. 3) Annual Rainfall is 2,200 to 2,800 mm 4) High yield of rice, accounting for 60% of the country's yield 5) Regarded as less problem area for agricultural production, though drainage improvement is necessary
Zone-4 Coastal Area (Mon, Tanintharyi, Rakhine)	<ol style="list-style-type: none"> 1) Including three coastal area (Mon, Tanintharyi, Rakhine). Large rainfall (3,000 - 5,000mm) 2) Agricultural land along both sides of river 3) Permanent crops such as rubber, coconuts and oil palm 4) Self-sufficient area of rice with other various crops 5) High development potentials of rubber, coconuts and oil palm

For the selection of study area, the following factors were taken into consideration:

- Since agricultural TSL shall not be applied only to specific, limited agricultural conditions, the TSL schemes shall cover various types of agriculture in the county.
- Not only agricultural mechanization but also agribusiness development is the focus for TSL. Thus, the areas where agro-processing industries are active, and major markets exist nearby are preferred.
- From the viewpoint of management of the study, the areas shall be accessible by land transportation from Yangon and Nay Pyi Taw.
- Synergy effects can be expected when TSL is applied in the same places as other existing major agricultural development projects under Japan's ODA scheme.

From above viewpoints, the following areas were selected as target area of the Study:

- 1) Ayeyarwady Delta (northern part of Ayeyarwady Region and western part of Bago Region)
- 2) Shan State (southern part of Shan State)
- 3) Central Dry Zone (CDZ) (Sagaing, Mandalay and Magway Regions)

Data from MADB shows that among 4,544 borrowers of Term Loan provided by MADB in the fiscal year 2010/11, 3,037 cases (67%) were handled by its branch offices located in these three areas above. This means that selecting these areas for the study can be also advantageous in the implementation stage of TSL in the future.

The total numbers of farm households in Ayeyarwady and Bago are 1.47 million, and 55.9% of which have farm size with less than 5 ac. Assuming that minimum farm size to feed a family is 10 ac, 85.8% of famers are classified as small scale farmers.

The total number of farm households in Shan State is 0.64 million, and 78% of which have farm size with less than 5 ac. This percentage is the highest in three areas of the Study this time. Assuming that minimum farm size to feed a family is 10 ac, 96.4% of famers are classified as small scale farmers.

The total number of farm household in the three Regions of CDZ is 1.89 million, and 58.1% of which have farm size with less than 5 ac. Assuming that minimum farm size to feed a family is 10 ac, 85.3% of famers are classified as small scale farmers.

Table 2-8. Number of Farm Households by Farm Size in the 3 Study Areas

Region	Less than 5ac		5 to 10 ac		10 to 20 ac		20 to 50 ac		50 to 100 ac		Above 100 ac		Total	
	No. of Farm Household	Acreage (ac)	No. of Farm Household	Acreage (ac)	No. of Farm Household	Acreage (ac)	No. of Farm Household	Acreage (ac)						
1. Ayeyarwady Delta														
Ayeyarwady	455,847	1,067,544	230,013	1,691,625	102,910	1,480,625	23,424	697,353	1,403	101,053	510	224,077	814,107	5,262,277
Bago	366,074	677,581	209,770	1,517,929	70,353	978,651	9,957	287,958	513	34,197	528	131,681	657,195	3,627,997
Total (Delta)	821,921	1,745,125	439,783	3,209,554	173,263	2,459,276	33,381	985,311	1,916	135,250	1,038	355,758	1,471,302	8,890,274
2. Shan State														
Shan (south)	239,191	646,923	62,007	440,065	15,408	218,815	3,341	92,151	113	8,513	171	93,073	320,231	1,499,540
Shan (north)	229,318	612,122	69,670	496,248	11,894	185,524	3,578	107,939	518	39,571	566	143,940	315,544	1,585,344
Shan (east)	172,072	393,380	11,380	76,359	853	13,752	723	18,217	201	15,864	134	93,064	185,363	610,436
Total (Shan)	640,581	1,652,425	143,057	1,012,672	28,155	418,091	7,642	218,307	832	63,748	871	330,077	821,138	3,695,320
3. CDZ														
Sagaing	354,398	1,027,740	218,699	1,619,360	96,897	1,453,482	29,805	938,006	2,141	168,017	314	151,366	702,254	5,357,971
Magway	458,935	1,130,443	132,089	925,558	52,594	745,148	10,843	294,262	168	10,440	160	115,705	654,789	3,221,556
Mandalay	288,903	762,168	166,269	1,188,121	66,517	936,569	19,438	511,706	155	10,199	103	65,408	541,385	3,474,171
Total (CDZ)	1,102,236	2,920,351	517,057	3,733,039	216,008	3,135,199	60,086	1,743,974	2,464	188,656	577	332,479	1,898,428	12,053,698
Grand Total (3 Study Areas)	2,564,738	6,317,901	1,099,897	7,955,265	417,426	6,012,566	101,109	2,947,592	5,212	387,654	2,486	1,018,314	4,190,868	24,639,292
Proportion (%)	61.2%	25.6%	26.2%	32.3%	10.0%	24.4%	2.4%	12.0%	0.1%	1.6%	0.1%	4.1%	100.0%	100.0%

Source: DOA

4-2. Characteristics of Agriculture in the 3 Study Areas

To grasp the current agricultural condition for the identification of needs for agricultural financing, a Farm Household Economy Survey and Local Market Survey were executed from August to September 2013.

For the Farm Household Economy Survey, interviews with farmers were made in the areas of Shan

south with 240 farmers, Bago west with 120 farmers, Ayeyarwady north with 120 farmers; giving a total of 480 farmers. The targeted farmers were selected randomly through DOA Township Offices in 16 Townships; 7 in Shan south, 4 in Bago west, and 5 in Ayeyarwady north Regions, respectively. The Survey was conducted by interviews with a structured questionnaire composing of farmers' basic information, financial status, farming status, and agricultural management.

The results of the Survey were combined together with the results of similar survey made in the Central Dry Zone during the Study on the Collection and Verification of Information on the Project for Development of Water Saving Agriculture Technology in the Central Dry Zone in May 2013, for which also 240 farm households were interviewed in the CDZ. The information was analyzed together to identify the differences of agricultural characteristics among these three areas.

From the detailed results of these surveys, including information which does not appear in Annex-1 of this report, we made the following major findings on the agricultural situation in the three study areas:

(1) Agricultural Production

(a) Farm Size

The result of Farm Household Economy Survey shows that in comparison with other two study areas, the average farm size in upland in Ayeyarwady Delta is the smallest, while that of lowland (paddy land) is the largest among the three study areas.

In Shan State, the total number of farm households is 0.64 million, 78% of which have farm size of less than 5 ac. This percentage is the highest in three areas of the Study this time. Assuming that minimum farm size to feed a family is 10 ac, 96.4% of famers are classified as small scale farmers.

In the CDZ, the total number of farm household in the three Regions is 1.89 million, 58.1% of which have farm size with less than 5 ac. Assuming that minimum farm size to feed a family is 10 ac, 85.3% of famers are classified as small scale farmers.

Table 2-9. Farm Size of Sample Farmers in Upland and Paddy Land in the 3 Study Areas

(Unit: Acre)

	Upland			Paddy Land		
	Ady Delta	Shan south	CDZ	Ady Delta	Shan south	CDZ
Average	0.4	9.1	14.4	13.5	5.7	1.0
Max	15.0	240.0	80.0	94.0	60.0	20.0
Minimum	0.0	0.0	0.0	0.0	0.0	0.0

Source: JICA Study Team

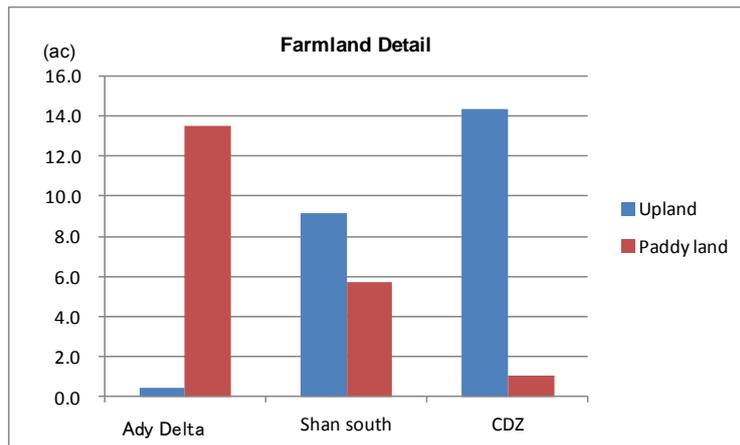


Figure 2-1. Farm Size of Sample Farmers in Upland and Paddy Land in the 3 Study Areas

On the distribution of farm household by farm size, number of farmers with farm land between 5 to 10 ac. in Ayeyarwady Delta is the largest among the three study areas.

In Shan State, number of farmers with farm land between 15 to 20 ac. is the smallest among the three study areas.

In the CDZ, the number of farmers with farm land less than 5 ac. is the smallest, while that of between 10 to 15 ac. is the largest among the three study areas.

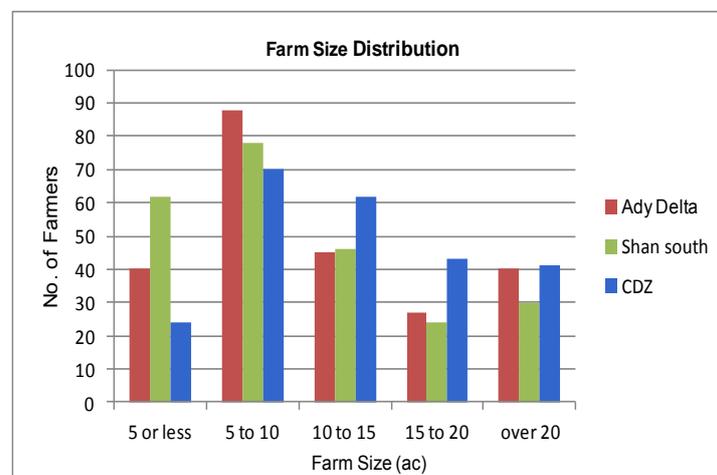


Figure 2-2. Distribution of Sample Farmers by Farm Size in the 3 Study Areas

(b) Major Crops

Figure 2-3 below shows the planted area of major crops by sample farmers in the three Study Areas.

In comparison with other two study areas, the numbers of farmers planting both monsoon paddy and summer paddy are the largest in three study areas in Ayeyarwady Delta.

Shan State provides suitable climate condition for vegetable production due to its advantage in low

temperature. As result, crops which are suitable in cool climate are commonly planted in the State.

In the CDZ, the result of Farm Household Economy Survey shows that in comparison with the other two study areas, the numbers of farmers planting both sesame and groundnuts are the largest in three study areas.

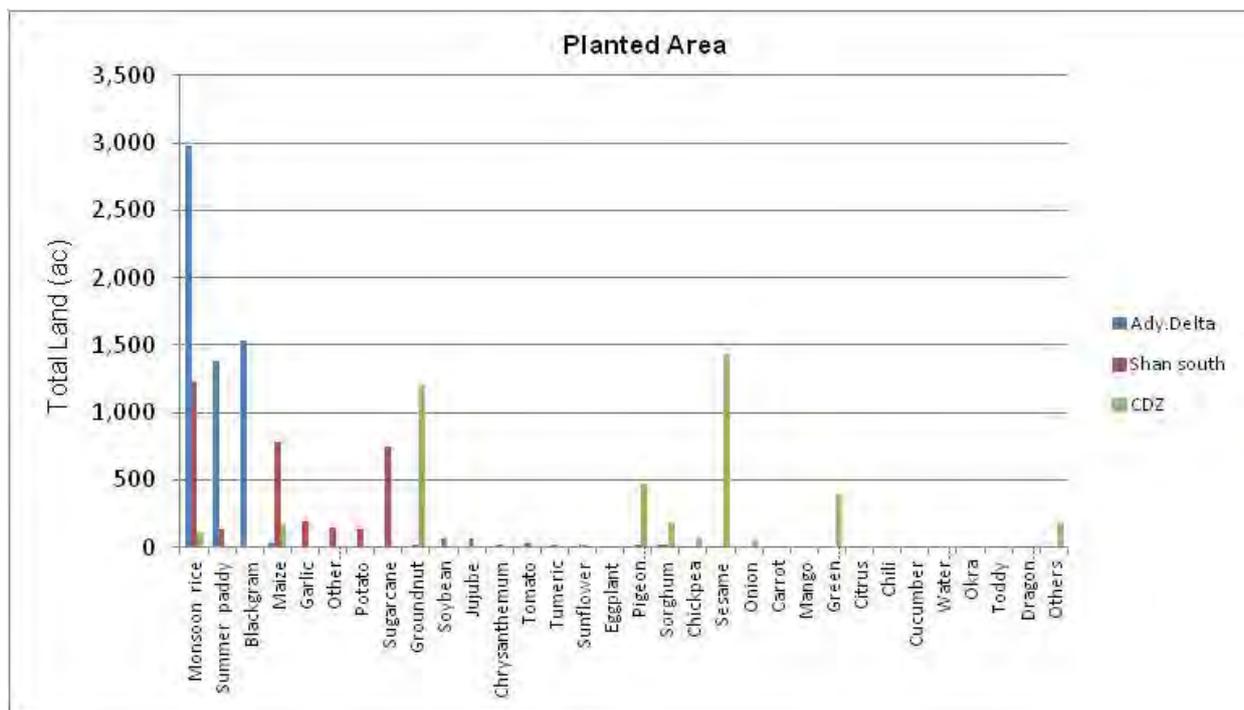


Figure 2-3. Planted Area of Major Crops by Sample Farmers in the 3 Study Areas

(c) Livestock and Fisheries

As compared with other areas, livestock in Ayeyarwady Delta is characterized with its numbers of pigs, chickens and ducks, as the survey shows that the numbers of farmers who have these animals are the largest among the three study areas.

In Shan State, livestock is not so common. The survey result shows that Shan State has the smallest number of farmers in the three study areas for every animal surveyed.

As compared with other areas, livestock in the CDZ is characterized by the number of cattle farmers, as the survey shows that 92% of farmers interviewed in the area have cattle.

Table 2-10. Number of Sample Farmers Owning Livestock in the 3 Study Areas
(Number of farmers, multiple answer)

	Ady Delta	Shan south	CDZ	Total
Cattle	159	51	221	431
Buffalo	20	16	0	36
Goat/sheep	2	0	0	2
Pig	71	30	-	101
Chicken	106	17	5	128
Duck	42	1	0	43
Fish Pond	1	4	0	5
Total Sample	240	240	240	720

Source: JICA Study Team

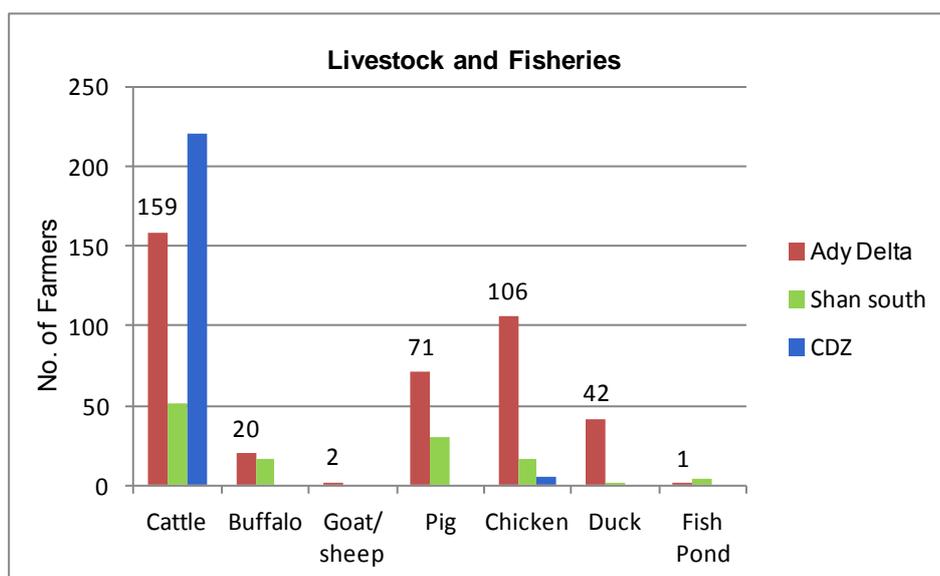


Figure 2-4. Number of Sample Farmers Owning Livestock in the 3 Study Areas

(d) Agricultural Productivity

Figure 2-5 shows the comparison of annual income by irrigated farming and rainfed farming in the three study areas. It is noted that annual income of sample farmers in irrigated farming is slightly lower than that of farmers by rainfed farming. In the CDZ, unlike the result of the other two areas, the disparity between the average annual income of farmers in irrigated and rainfed farming is significantly larger.

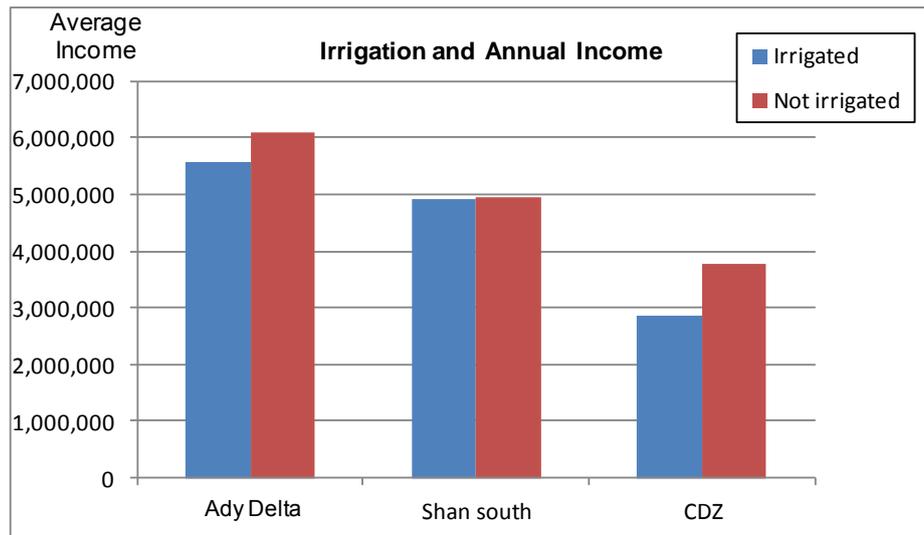


Figure 2-5. Comparison of Income by Irrigated and Rainfed Farming in the 3 Study Areas

On this Survey, most of farmers interviewed in the CDZ were rice farmers. These farmers plant rice in irrigated farmland, and they also plant cash crops such as groundnuts in rainfed areas. On the other hand, farmers who do not plant rice also plant cash crops in rainfed areas.

Production cost of rice per area is significantly high while profit is low as compared to other crops such as legumes and oil crops. However, farmers still prefer to plant rice since 1) paddy is recommended in irrigated area, and 2) farmers prioritize rice for the purpose of self-consumption.

Based on the result, it can be said that irrigation is necessary in the area to support farmers where farmers prefer to plant rice with low profitability, and also necessary to increase production of other crops with high profitability in the same place, to supplement income of rice farmers, especially in the CDZ.

(e) Farming Income

In Ayeyarwady Delta, average annual income from agricultural production is the biggest among the three study areas. It is also noted that dependence on agricultural income in total income is also highest of the three Study areas.

In Shan State, average annual income from agricultural production is the second biggest, following that of Ayeyarwady Delta. It is also noted that, as with the Delta, dependence on agricultural income in total income is also high.

In the CDZ, average annual income from agricultural production is the smallest among the three study areas. However, it is also noted that dependence on agricultural income in total income is not so high as the other 2 Study areas.

Table 2-11. Average Annual Income of Sample Farmers by Farm Size in the 3 Study Areas
(Unit: kyat/year)

	5ac or less	5ac - 10ac	10ac - 15ac	15ac - 20ac	over 20ac
Ady Delta	2,136,625	3,642,455	5,985,022	7,448,519	13,103,725
Shan south	1,323,250	1,974,036	2,800,097	3,939,953	8,705,805
CDZ	1,951,129	3,492,821	5,174,130	4,786,458	14,525,333
Total	1,890,421	3,098,129	4,450,601	5,163,862	11,863,486

Source: JICA Study Team

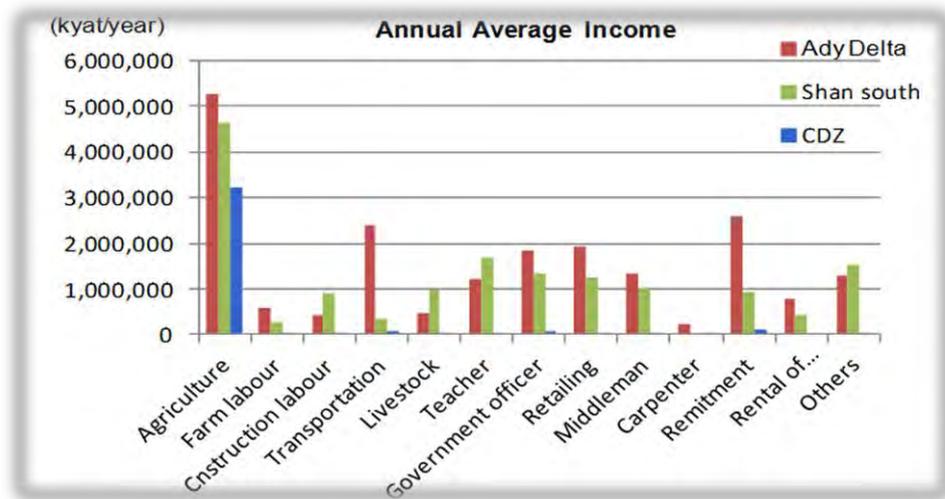


Figure 2-6. Annual Average Income of Sample Farmers by Source of Income in the 3 Study Areas

For the distribution of income by farm size in Ayeyarwady Delta, it is also noted that the average annual income of farmers in Ayeyarwady Delta is the highest in all classes of farmland size, as compared to the other two areas.

It is noted that average annual income of farmers interviewed in Shan State is the lowest among the three study areas, regardless of their farm size.

It is also noted that in the CDZ, the average annual income of farmers with farmland of more than 20 ac. is the largest among the three study areas.

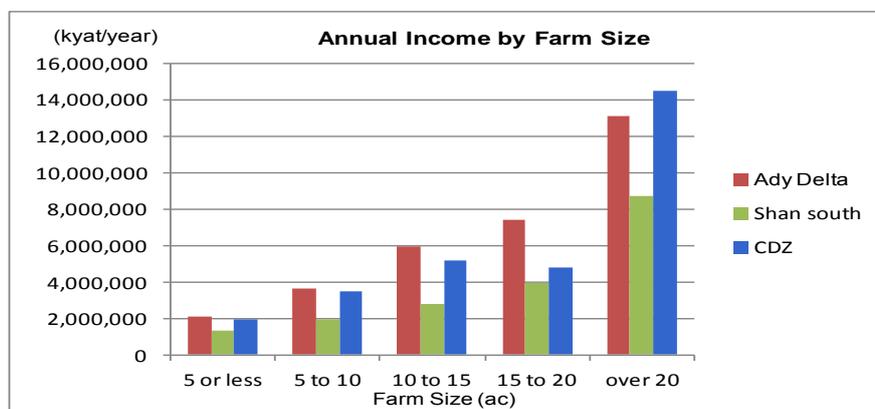


Figure 2-7. Distribution of Annual Income of Sample Farmers by Farm Size in the 3 Study Areas

(2) Local Market

In Bago Region, rice is the main crop and pulses are planted as winter crops. However, some areas are suitable for cultivation of vegetables. Cabbages, tomatoes, chou-fleur produced in Pyay are sold in the markets mainly from October to February, however those transported from Shan State are sold in other months. The prices of cabbages, tomatoes and chou-fleur of Shan State are 800 kyat/piece, 800 kyat/viss (approx. 490 kyat/kg) and 800 kyat/piece each, on the other hand the price at Pyay are 300 kyat/piece, 300 kyat/viss (approx. 180 kyat/kg) and 300 kyat/piece respectively. The price of Shan State products is two times that of Pyay products because they are off-season products. Carrots, potatoes and mangoes from Shan State are sold in this market through the year, and these prices are 800 kyat/viss (approx. 490 kyat/kg), 800 kyat/viss (approx. 490 kyat/kg) and 400 kyat/piece respectively. On the other hand, local produce such as eggplant, chili and banana, are sold for 800 kyat/piece, 1,400 kyat/viss (approx. 850 kyat/kg) and 1,000 kyat/bunch each through the year.

In Ayeyarwady Region, rice and pulses are produced more than in Bago Region. Their price of rice, 600 kyat/kg is cheapest in all three markets, in Ayeyarwady, Bago and Shan State. Except rice and some kinds of vegetables, many vegetables and fruits sold in Ayeyarwady are from various Regions, mainly Shan State, or imported from China or Thailand. Therefore, people can buy many kinds of vegetables and fruits through the year.

In Shan State, many kinds of vegetables and fruits are produced under abundant rainfall and fertile soil, for example cabbages, tomatoes and mangoes. In addition, tea leaves and flowers such as chrysanthemums and roses produced in Shan State are distributed nationwide. People can buy many kinds of vegetables in the market of Shan State through the year. For example, the price of cabbage is 200 kyat/piece and that of tomato is 500-800 kyat/viss (approx. 300-490 kyat/kg). 57% of the potato production of the whole country is produced in Shan State and its price is from 600-1,000 kyat/viss (approx. 370-610 kyat/kg) in this market. On the other hand, mangoes and dragon fruits produced in Shan State are sold from June to September at prices of 330 kyat/piece and 1,000 kyat/piece, respectively.

In the CDZ covering Magway, Mandalay and Sagaing Regions, pulses and oil crops are predominantly produced mainly under rainfed condition. Some products from Magway, Minbu and Yenangyaung are sold in Magway market, however, when they are not available in some season, products from Aungban of Shan State are sold in the market. For example, cabbage from Minbu is sold for 200-250 kyat/piece from November to December, however cabbage from Aungban is sold for 550-600 kyat/piece from March to May.

Many vegetables sold in Myingyan market are cultivated in surrounding areas. However, cabbages

and tomatoes from Myingyan are sold from December to February, and those from Shan State are sold in April and May, and then the latter's price is about three times the former's price. Potatoes produced in Pakokku are sold for 500-600 kyat/viss (approx. 300-370 kyat/kg) from December to January, however potato from Shan State are sold for 1,000 kyat/viss (approx. 610 kyat/kg) in May.

In Nyaung Oo Township, many kinds of vegetables produced in Pakokku are sold in Nyaung Oo market. For example tomato of Pakokku is sold for 1,200-1,500 kyat/viss (approx. 730-910 kyat/kg) between May and June, however tomatoes of Nyaung Oo are sold for 150-200 kyat/viss (approx. 90-120 kyat/kg) between December and January. On the other hand, fruits sold in this market are produced in surrounding areas. Mango produced in Popa is sold for 250-330 kyat/piece in May and 500 kyat/piece in June.

In Mandalay, some products sold in the local market are produced in Shwebo, Myingyan and Monywa which are located in the CDZ. Cabbage produced in Mandalay is sold for 150 kyat/piece from December to January, then that produced in Shan State is sold for 500-600 kyat/piece from April to May. Tomatoes produced in Monywa or Shwebo are sold for 800-1000 kyat/viss (approx. 490-610 kyat/kg) in March and for 1,100-1,300 kyat/viss (approx. 670-790 kyat/kg) in April.

Retail market prices of major agricultural commodities in the three study areas are shown in Table 2-12 and 2-13.

Table 2-12. Retail Market Price in Ayeyarwady Delta and Shan South (As of June to July 2013)

Location	Ayeyarwady (north)			Bago (west)			Shan (south)		
Name of Market	Shwe Pyi Thar Market (Patheingyi)			Say Gyi Market (Pyay)			Myoma Market (Taunggyi)		
Date of Survey	7-Sep-13			4-Sep-13			30-Aug-13		
Crop Name	Season	Price	Origin	Season	Price	Origin	Season	Price	Origin
Rice	Whole season (Sticky)	1200k/2kg	Ayeyarwady	Whole season	1100/kg	Pyay	Whole season	1220/kg	Shan
	Whole season (Paw san)	1200k/2kg	Ayeyarwady						
Cabbage	Whole season	400k/piece	Yangon	Mar-Sep	800k/piece	Shan	Whole season	200/piece	Shan
				Oct-Feb	300k/piece	Pyay			
Tomato	Whole season	490k/kg	Yangon	Mar-Sep	490k/kg	Shan	Whole season	490k/kg (big)	Shan
				Oct-Feb	180k/kg	Pyay	Whole season	300k/kg (small)	Shan
Carrot	Whole season	1220k/kg	Shan (Taiwan variety)	Whole season	490k/kg	Shan	Whole season	200k/6piece	Shan
Eggplant	Whole season	700-1000k/piece	Shan, Ayeyarwady	Whole season	800k/10piece	Pyay	Whole season	600k/piece	Shan
Radish				Whole season	1100k/kg	Shan	Whole season	730k/kg	Shan
				Whole season	1620k/kg	Thailand			
Okra	Whole season	550k/kg	Ayeyarwady	Whole season	100k/10piece	Pyay	Whole season	100k/5piece	Shan
Potato	Whole season	430k/kg	Aungban (Shan)	Whole season	490k/kg	Shan	Whole season	610k/kg (big)	Shan
							Whole season	370k/kg (small)	Shan
Onion	Whole season	610k/kg	Seirphyu (Magway)	Whole season	550k/kg	Magway	Whole season	610k/kg (big)	Myitha
							Whole season	430k/kg (small)	Myitha
Garlic (Burma White)	Whole season	1460k/kg	Shan	Whole season	850k/kg	Shan	Whole season	200k/can	Shan
Garlic (China White)	Whole season	790k/kg	China						
Chili	Whole season	610k/kg	Yangon	Whole season	910k/kg	Pyay	Whole season	100k/can	Shan
Banana	Whole season	200-400k/bunch	Kyone Pyaw, Lay Myat Nar (Ayeyarwady)	Whole season	1000k/bunch	Pyay	Whole season	2000k/bunch	Mandalay
Mango	May-Sep	600/piece	Mandalay	Jul-Oct	400k/piece	Shan	Jun-Sep	1000/3piece	Shan
Grape	Jul-Feb	1520-2740k/kg	Meiktila	Whole season	1830k/kg	Chin	Jun-Sep	4000/piece	China
	Jul-Feb	3350k/kg	China	Whole season	910k/kg	Meiktila			
Watermelon	Whole season	1700/piece	Taiwan	Aug-Sep	1800k/piece	Mandalay			
Dragon Fruits	Jun-Feb	1500/piece	Thailand	Jul-Sep	1000k/piece	Thailand	Jun-Sep	1000/piece	Shan
							Oct	1000/piece	China
Flower (white chrysanth)	Whole season	2000k/10piece	Taunggyi (Shan)	Whole season	1200k/10piece	Memyo	Whole season	1300k/band	Shan
Flower (Yellow chrysanth)	Whole season	1000k/10piece	Taunggyi (Shan)	Whole season	500k/10piece	Shan	Whole season	500k/10piece	Shan
				Sep	500k/10piece	Pyay			
Peach						Whole season	1000k/piece	China	
Persimmon						Jun-Sep	200k/piece	China	
Pear	Aug-Oct	400k/piece	Shan	Jun-Oct	50-200k/piece	Shan	Whole season	500k/piece	China
Apple	Whole season	600k/piece	Thailand	Whole season	50-100k/piece	China	Whole season	700k/piece	China
	Jun-Feb	650k/piece	USA	Jun-Aug	50-100k/piece	Chin			
	Feb-Jul	300-500k/piece	China						
Mangosteen						Jun-Sep	200k/piece	Mawlamyaing	
Lemon				Whole season	50-100k/piece	Pyay	Jun-Nov	200k/piece	Shan
Pineapple	Whole season	1000k/piece	Shan	Aug-Oct	1000k/piece	Shan	Jun-Sep	700k/piece	Shan
				Jun-Jul	500k/piece	Lakhin			
Asparagus				Whole season	2440k/kg	Shan	Whole season	1000k/20piece	Shan
				Whole season	1220k/kg	Pyay			
coriander						Whole season	200k/3band	Shan	
Cucumber	Whole season	100k/piece	Yangon	Whole season	30-80k/piece	Pyay	Whole season	200k/piece	Shan
Rose	Whole season	800k/10piece	Hmaw Bi, Tike Kyi (Yangon)	Whole season	400k/band	Pyay	Whole season	500k/band	Shan
Avocad	Whole season	400k/piece	Shan				Aug-Apr	200k/piece (big)	Shan
							Aug-Apr	100k/piece (small)	Shan
Melon	Sep	2000k/piece	Shan, Mandalay	Whole season	1500-2000k/piece	Mandalay			
Pomelo	Whole season	1300k/piece	Mawlamyaing	Aug-Sep	1500k/piece	Mon			
Orange	Whole season	500k/piece	China						
	Whole season	200-500k/piece	Shan						

Source: JICA Study Team

Table 2-13. Retail Market Price in the CDZ (As of June to July 2013)

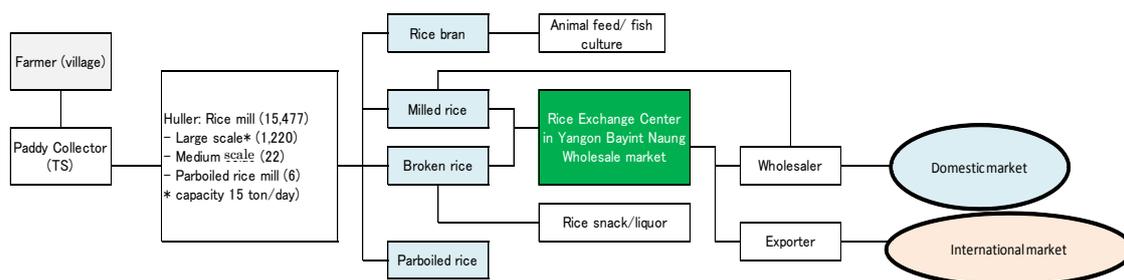
Location	Magway TS			Myingyan TS			Nyaung Oo TS			Mandalay		
Name of Market	Yan Pe Market			Aye Mya Thidar Market			Mani Sithu Market			Thiri Mariar Market (Wholesale)		
Date of Survey	8-May-13			6-May-13			5-May-13			30-Apr-13		
Crop Name	Season	Price	Origin	Season	Price	Origin	Season	Price	Origin	Season	Price	Origin
Rice												
Cabbage	Mar-May	550-600/piece	Aungban (Shan)	Apr-May	500k/piece	Shan				Dec-Jan	150k/piece	Mandalay
	Nov-Dec	120-180k/kg	Minbu (Magway)	Dec-Feb	100-200k/piece	Myingyan				Apr-May	500-600k/piece	Shan
Tomato	Feb	910k/kg	Magway (Riverbank)	Apr-May	730k/kg	Shan (North)				Mar	490-610k/kg	Monywa,Shwebo
	May	730k/kg	Aungban (Shan)				May-Jun	730-910k/kg	Pakokku	Apr	670-790k/kg	Monywa,Shwebo
	Nov	120k/kg	Magway	Dec-Feb	240k/kg	Myingyan, Mandalay	Dec-Jan	90-120k/kg	Nyaung Oo			
Carrot	May-Jun	300-490k/kg	Minbu, Shan	Apr-May	610k/kg	Pyin U Lwin (Mandalay)	May-Jun	300-430k/kg	Pakokku	May	240-370k/kg	Pyin U Lwin (Mandalay)
	Jan-Feb	200-300k/kg	Magway (Riverbank)	Dec-Feb	300-370k/kg	Myingyan, Mandalay	Dec-Jan	240k/kg	Pakokku			
Eggplant	Mar-Apr	300k/kg	Magway (Riverbank)	Apr-May	240-300k/kg	Myingyan						
	May-Jun	240-300k/kg	Magway (Riverbank)				May-Jun	240k/kg	Pakokku			
	Jan-Feb	120k/kg	Magway (Riverbank)	Dec-Feb	60k/kg	Myingyan	Dec-Jan	180k/kg	Pakokku			
Radish	Apr-May	150k/bundle	Yenan-gyaung							Mar	100k/bundle	Myingyan, Swebo
	Dec-Feb	80-100k/bundle	Magway							Apr-May	250k/bundle	Myingyan, Swebo
Okra	Apr-May	100k/10piece	Minbu				Apr	400-490k/kg	Pakokku			
	Jun-Oct	50k/10piece	Magway (Riverbank)				May	120k/kg	Pakokku			
Potato	Apr-May	490k/kg	Shan	May	610k/kg	Shan	Apr-May	610-730k/kg	Taunggyi (Shan)			
	Aug-Sep	610-730k/kg	Shan									
	Oct-Dec	180-300k/kg	Shan, Magway (Riverbank)	Dec-Jan	300-370k/kg	Pakokku	Dec-Jan	430-490k/kg	Taunggyi (Shan)			
Onion	Mar	120-180k/kg	Magway (Riverbank)				Mar-Apr	120-180k/kg	Nyaung Oo	Mar-May	180-280k/kg	Myingyan, Monywa, Pakokku, Myittha
	May	240-300k/kg	Magway (Riverbank)	Apr-Jul	370k/kg	Myingyan	May	300k/kg	Pakokku	Oct-Nov	490-550k/kg	Myingyan, Monywa, Pakokku, Myittha
	Oct-Dec	370k/kg	Magway (Riverbank)	Nov	610k/kg	Myingyan	Jul-Oct	490-610k/kg	Pakokku	Dec-Jan	850k/kg	Myingyan
Garlic (Burma White)	Feb-Mar	790-850k/kg	Shan	Mar-Apr	300-490k/kg	Myingyan				Mar	490-790k/kg	Mandalay
	May	730-122k/kg	Meiktila, Shan	May	910-1220k/kg	Shan, Myingyan	May	1220-1460k/kg	Mandalay	Apr	610-910k/kg	Mandalay, China
	Oct-Nov	1220k/kg	Magway									
Garlic (China White)												
	May	1460k/kg	Shan									
Chili	Mar-May	790k/kg	Minbu, Magway	May	610k/kg	Myingyan						
	Jun-Jul	300-370k/kg	Magway (East Riverbank)				May-Jun	610-730k/kg	Pakokku			
Banana				Dec-Jan	300-370k/kg	Myingyan, Riverbank	Dec-Jan	180-300k/kg	Pakokku			
	May	1000k/hand	Magway (Riverbank)	May	600-800k/hand	Minbu	May	1000-1500k/hand	Kyaukpadaung			
	Jun-Sep	400-500k/hand	Magway (Riverbank)	Dec-Jan	500-600k/hand	Minbu	Festival Season	1700k/hand	Kyaukpadaung			
Mango	May	300k/piece	Mandalay	Jun	50k/piece		May	250-330k/piece	Popa			
	Jun	150-350k/piece	Mandalay	Jul	700-900k/piece		Jun	500k/piece	Popa			
Grape	Apr-May	1220k/kg	Meiktila	Apr	1220k/kg	Meiktila	Mar	2440k/kg	Meiktila	Apr	1220-2440k/kg	Meiktila
	Jun-Jul	730k/kg	Meiktila	Jun	730k/kg	Meiktila	May	1520k/kg	Meiktila	Jul	610k/kg	Meiktila
Watermelon	Feb-Mar	800k/piece	Magway				Apr-May	2000-2500k/piece	Myingyan, Mandalay			Kyaukse (Mandalay)
	May	500k/piece	Magway									
Dragon Fruits							Nov-Dec	500-700k/piece	Myingyan, Mandalay			
										Apr	2000k/piece	China, Thai
Flower (white chrysanth)						May	2100-2500k/bundle	Pyin U Lwin (Mandalay)				
Flower (Yellow chrysanth)	May	300k/bundle	Minbu									
	Jun-Jul	100k/bundle	Minbu									
Peach												

Source: JICA Study Team

5. Supply Chain of Major Crops in Myanmar

5-1. Paddy/Rice

Supply chain of paddy/rice is as indicated in the figure below. As of April 2013, there were 15,500 traditional rice mills (“hullers”), 1,220 of large-scale rice mills with capacity of above 15 tons/day, 22 modern-type rice mills, and 6 parboiled rice mills. Milled rice and broken rice are traded at the Rice Exchange Center, and distributed to domestic/overseas markets by dealers and exporters. Also, part of the broken rice is sold to the manufacturers of food snacks and alcoholic drinks, while rice bran is processed and sold as livestock feed.



Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

Figure 2-8. Supply Chain for Rice

It is said that more than 99% of rice mills are privately owned. However, presently more than 90% of rice mills, including hullers, have problems in quality control, and modernization of milling technology is expected to be introduced.

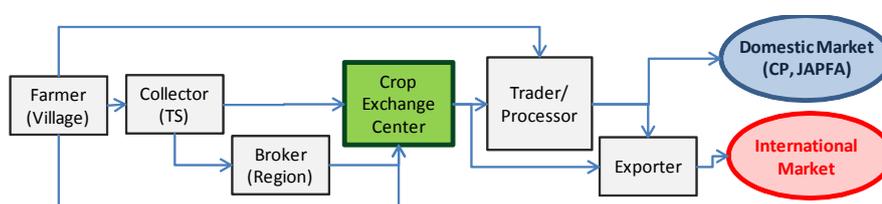
Rice farmers (producers) are classified into small scale farmers and large scale farmers with farmland of 100 to 300 ac. Such difference in production style determines also the different needs for financing. The Seasonal Loan is necessary for small scale farmers, however, needs for machinery is also expected in Bago and Ayeyarwady where access to irrigation water is easier than in the CDZ. Data on machinery sales volumes in these areas also shows that even small scale farmers may have potential need to require loans for the purchase of machinery.

Though numbers are limited, large scale farmers have greater finance capability than small scale farmers, and are engaged in agribusiness such as operation of rice mills, sale of agricultural machinery, contract farming with small farmers, etc. Such large scale farmers have potential needs for financing to expand their operations by replacing deteriorated rice milling machinery, acquiring additional combine harvesters and 4-wheel tractors, as well as acquiring attachments for such machinery. Also, the needs for finance may not be limited to purchase of machinery but also for small construction works for land preparation.

For marketing, processing companies and exporters may have potential needs for finance in the construction of warehouses, and necessary machinery such as forklifts, roller conveyers and packing machines.

5-2. Maize

The supply chain of maize grain is illustrated below. Maize harvested by farmers is collected by a collector stationed in the center of townships, and is dealt by local middlemen (collector and broker) and regional buyers and processors, and exported from the Crop Exchange Center located at the regional center or a major city. According to the farm household survey in the CDZ, about 70% of farmers sell maize to markets and 30% for home consumption.



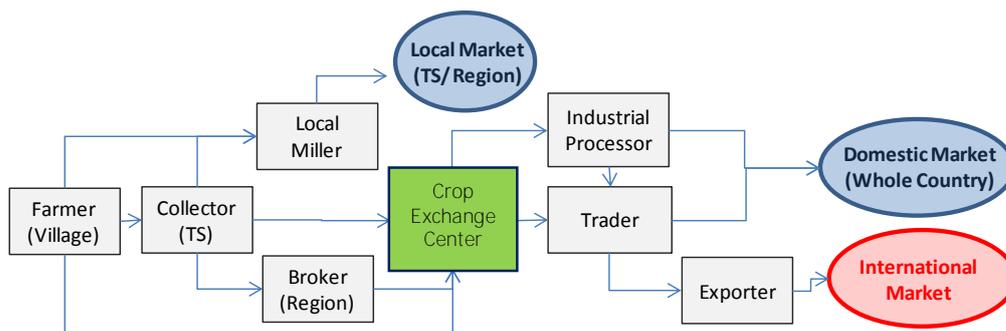
Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

Figure 2-9. Supply Chain for Maize

Maize production for exporting purpose seems to be systematic under contract farming, thus needs for financing at the producer's level may not as high as compared to that of rice. For marketing companies and exporters, there are potential needs for financing for warehouses to protect against aflatoxin caused by mold. Machinery to be used for these purposes, such as forklifts, roller conveyers and packing machinery may also require finance.

5-3. Oil Seeds

For the people in Myanmar, oil seed crops such as sesame, groundnut and sunflower are necessary crops next to rice. After piling harvested sesame near their field, sesame farmers transport sun-dried sesame by animal cart, or their own cars and tractors, to sell to collectors in townships. The collectors in farming areas trade products with domestic processors, urban traders and exporters at a nearby Crop Exchange Center.



Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

Figure 2-10. Supply Chain for Oil Seeds

Sesame is exported as seed and processed at importing countries such as China and Japan, while initial processing is being made for export to Korea as roasted Sesame powder. This is mainly due to the regulation in Korea on which raw materials (seed) are subjected to 45% import tax.

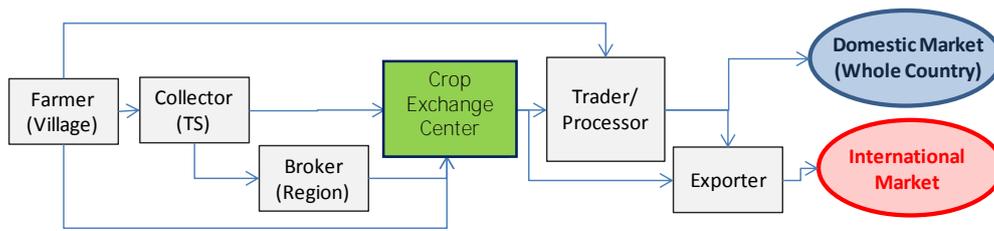
In the case of groundnut, many industrial processors exist within the country that process materials to final products, while the amount of sunflower traded at the local CEC is limited since they are mainly produced for home consumption by farmers.

Oil crops are the major agricultural products of CDZ. As compared to Bago and Ayeyarwady, farm mechanization in the CDZ has not progressed so far; likewise contract farming is not widely practiced. However, though limited in number, some farmers have started to introduce tractors and power tillers. This means that small scale farmers may also have potential needs for mechanization when agricultural loans with attractive conditions are offered, since the impact of farm mechanization can be maximized when plowing works are required to respond to limited frequency of rainfall.

Oil extraction and refining of groundnuts and sesame is practiced mainly by small and medium size industries, including exporters. There are potential needs for financing for the purpose of investing in and replacement of facilities and machinery for processes such as oil extraction, bottling and packing.

5-4. Pulses

The supply chain of legumes, as shown in the following figure, is basically the same as that of oil seed crops. Farmers sell to local collectors and brokers after securing the necessary quantity for home consumption. These brokers retail these products at local markets nearby, and also trade at CEC with urban processors, traders and exporters from Mandalay and Yangon. Legumes are processed mainly in Yangon, while there are limited processing factories in local cities such as Monywa and Myingyan.



Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

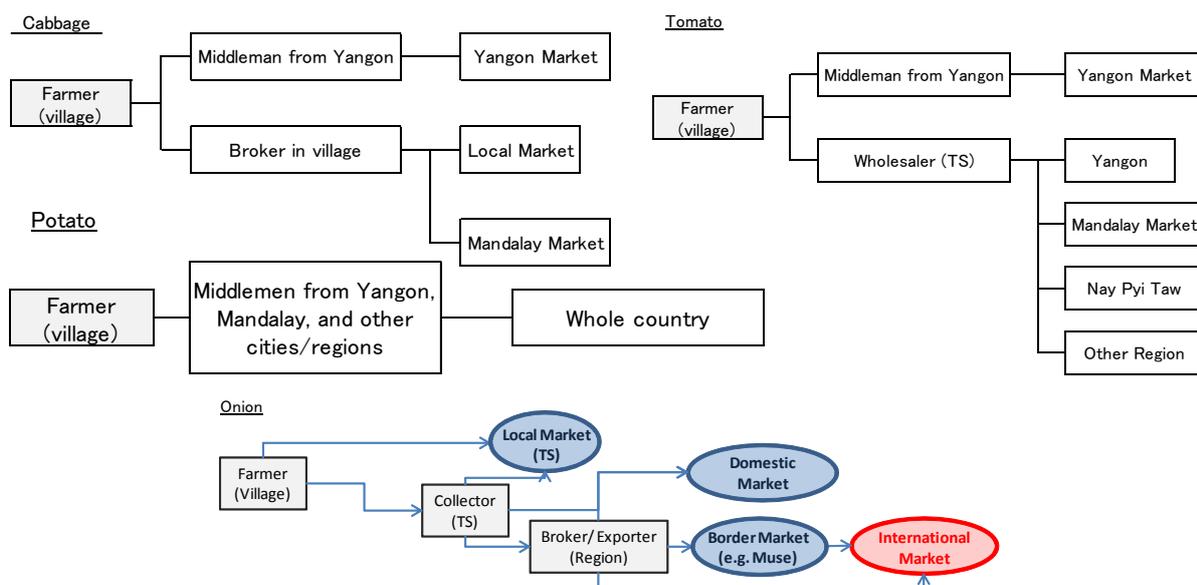
Figure 2-11. Supply Chain for Pulses

As stated on oil crops, CDZ is also a major production area of pulses, and mechanization has not progressed so far. However, for as same reason as oil crops, there is a potential need for farm machinery due to the limited frequency of rainfall.

Needs for financing in processing of pulses is also the same as for oil crops. They also need new investment and replacement of facilities and machinery, especially for grading, packing and storage. In such a situation, the necessity of warehouses for pulses may be stronger than that for oil crops.

5-5. Vegetables

Supply chains of the main four vegetables of cabbage, tomato, potato, and onion that are commonly consumed by consumers are shown below. Among them, onion is the only crop being exported to China and other countries, and distributed to many regions through middlemen, brokers and wholesalers.



Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

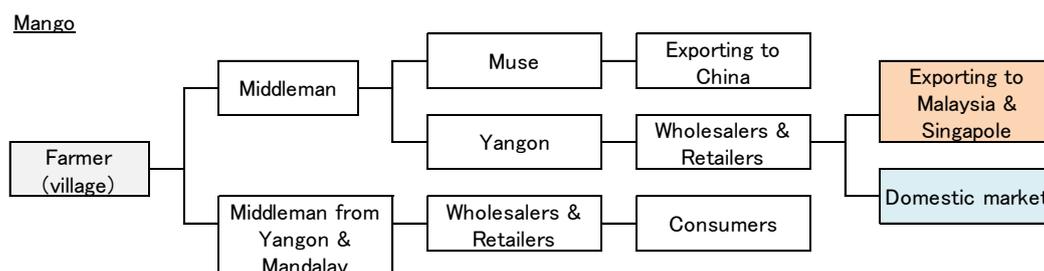
Figure 2-12. Supply Chain for Vegetables

The southern part of Shan State is one of the major production areas of vegetables such as cabbage and tomato. Since production areas on hillsides are suitable for efficient production, there are potential needs for agricultural machinery. Also, seasonal loans for cabbage production are not currently made, but they may be necessary, too.

Refrigerating facilities are also expected to be introduced when attractive loans become available for them, since the present percentage of post-harvest loss is high in the marketing of vegetables. These potential needs are expected to appear as demand for additional warehouses, refrigerating and packing facilities, as part of marketing improvements in the near future.

5-6. Fruits

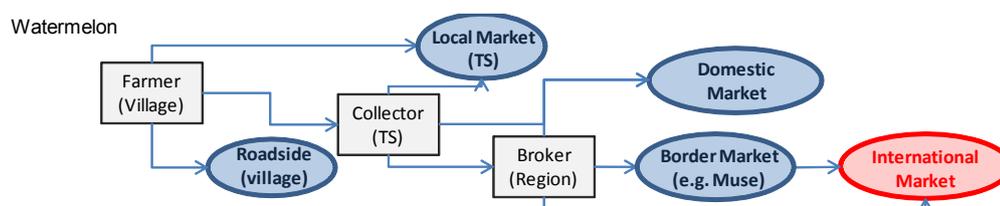
The example of the mango supply chain is as shown below. Local middlemen and middlemen from Yangon and Mandalay come to producing areas to procure mangoes to distribute to domestic markets and to export to Malaysia, Singapore and China etc. During transportation of mangoes, cooling systems are not used through the chain from farm to market levels.



Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

Figure 2-13. Supply Chain for Mangoes

Watermelons are also transported from farmland to markets in bulk on trucks without cooling systems. Some of them are sold at roadside shops, and others are exported mainly to China through collectors and brokers.



Source: Data Collection and Verification Study of Agricultural Sector in Myanmar (2013, JICA)

Figure 2-14. Supply Chain for Watermelons

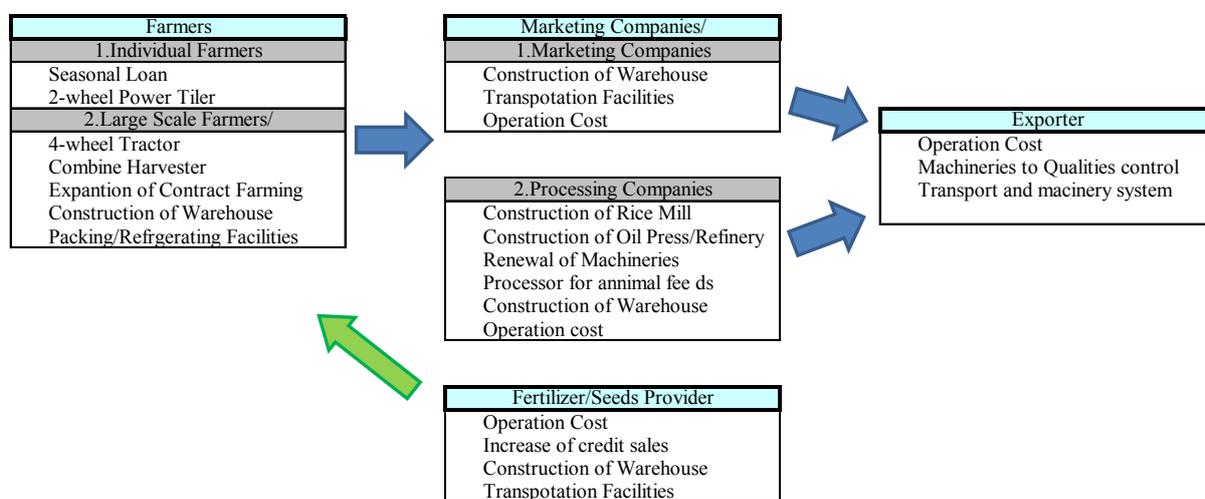
Production of fruits is presently not eligible for Seasonal Loans. However, potential financial needs

for machinery and facilities for fruits production are observed in Shan State where farmers organized themselves as cooperatives for marketing and exporting, and they also need agricultural machinery, packing and processing facilities to expand their operation.

As with vegetables, the percentage of post-harvest loss in fruits production/marketing is high at both the field level and market level, and introduction of refrigerating facilities will improve the situation for farmers, enabling them to provide high-quality products to consumers.

5-7. Potential Needs of Financing in Supply Chain

From the above observations, potential needs for financing in the supply chains are shown in Figure 2-15 below:



Source: JICA Study Team

Figure 2-15. Needs for Financing in Supply Chain (Conceptual Diagram)

These potential needs for financing in the supply chains are summarized by stakeholder in Table 2-14.

Table 2-14. Needs for Financing in Supply Chain

Stakeholder	Financial Needs	Purposes	Factors to Improve Supply Chain	Eligibility in TSL
Individual Farmers	Operation Cost	Purchase of seeds, fertilizers and pesticides	Establishment of efficient production system for stable amount of products into supply chain	Non-eligible
	Purchase of Agri. Machineries	Purchase of 2-wheel tractor	Labor-saving production	Eligible
Large Scale Farmers/ Agribusiness Entities	Purchase of Agri. Machineries	Purchase of 4-wheel tractor and combine harvester	Labor-saving production and harvesting	Eligible
	Expansion of Contract Farming	Provision of loan to contract farmers	Linkage of product flow from small-scale rice producers to markets in large volume of transaction	Non-eligible
	Construction Cost of Warehouse	Construction cost for normal temperature warehouses for rice and grain, purchase of belt conveyor, roller conveyor	Establishment of efficient storage and shipping system without decreasing quality	Eligible
	Packing/Refrigerating Facilities	Purchase of production machineries of cardboard box and plastic case, packing and sorting machineries, construction cost of refrigerated warehouse	Establishment of efficient storage and shipping system without decreasing quality	Eligible
	Replacement of Rice Milling Facilities	Rice mill machineries and other appurtenant equipments	Improvement of milling efficiency and quality	Eligible
	Operation Cost	Purchase of products, fuel cost and wages	Establishment of efficient production system and shipping system	Non-eligible
	Purchase of Transportation Facilities	Purchase of tracks, forklifts, belt conveyers and roller conveyers	Establishment of efficient shipping system without decreasing quality	Eligible
Cost for Farmland Development	Construction of irrigation and drainage facilities, land preparation	Efficient paddy production by using machineries	Eligible	
Marketing Companies	Construction Cost of Warehouse	Construction cost for normal temperature warehouses, purchase of belt conveyor, roller conveyor	Establishment of efficient storage system without decreasing quality	Eligible
	Purchase of Transportation Facilities	Purchase of tracks, forklifts, belt conveyers and roller conveyers	Establishment of efficient shipping system without decreasing quality	Eligible
	Replacement of Rice Milling Facilities	Rice mill machineries and other appurtenant equipments	Improvement of milling efficiency and quality	Eligible
	Operation Cost	Fuel cost and wages	Establishment of efficient storage and shipping system without decreasing quality	Non-eligible
	Purchase/Replace Cost for Packing/Sorting Machineries	Purchase of production machineries of cardboard box and plastic case, packing and sorting machineries, construction cost of refrigerated warehouse	Establishment of efficient storage and shipping system without decreasing quality	Eligible
Processing Companies	Replacement of Rice Milling Facilities	Construction cost for buildings, purchase cost for milling machineries, belt conveyor, roller conveyor	Improvement of milling efficiency and quality	Eligible
	Purchase/Replace Cost for Flour Mill/Refinery	Construction cost for buildings, purchase cost for flour milling machineries, belt conveyor, roller conveyor	Improvement of yield rate and quality	Eligible
	Purchase of Oil Press Machineries	Construction cost of buildings, purchase of refinery machines, bottling machines, etc.	Improvement of yield rate and quality	Eligible
	Purchase of Processor for Animal Feeds	Purchase of shredding machines, belt conveyors, roller conveyers	Improvement of yield rate and quality	Eligible
	Construction Cost of Warehouse	Construction cost for normal temperature warehouses, purchase of belt conveyor, roller conveyor	Establishment of efficient storage system without decreasing quality	Eligible
	Operation Cost and Purchase of Raw Materials	Purchase of raw materials to be processed, fuel cost and wages	Establishment of efficient storage and shipping system without decreasing quality	Non-eligible
	Purchase/Replace Cost for Packing/Sorting Machineries	Purchase of production machineries of cardboard box and plastic case, packing and sorting machineries, construction cost of refrigerated warehouse	Establishment of efficient storage and shipping system without decreasing quality	Eligible
Exporters	Operation Cost	Transportation cost of fuels and wages	Soundness of business operations	Non-eligible
	Construction Cost of Warehouse	Construction cost for normal temperature warehouses	Establishment of efficient storage and shipping system without decreasing quality	Eligible
	Purchase of Transportation Facilities	Purchase of tracks, forklifts, belt conveyers and roller conveyers	Establishment of efficient shipping system without decreasing quality	Eligible
Fertilizer/Seeds Providers	Operation Cost	Purchase of raw materials to be processed, fuel cost and wages	Soundness of business operations	Non-eligible
	Cost to Increase of credit sales	Provision of loan to newly-contracted farmers	Marketing development	Non-eligible
	Construction Cost of Warehouse	Construction cost for normal temperature warehouses	Establishment of efficient storage and shipping system of agricultural inputs without decreasing quality	Eligible
	Purchase of Transportation Facilities	Purchase of tracks, forklifts, belt conveyers and roller conveyers	Establishment of efficient shipping system without decreasing quality	Eligible

Source: JICA Study Team

6. Situation of Agricultural Financing in the Study Areas

6-1. Findings from the Result of the Farm Household Economy Survey

(1) Experience of Borrowing Money

Out of 480 sample farmers, 94% have experience of borrowing money. This implies that borrowing money is a common practice for agriculture and debit is a normal situation for farmers in rural areas.

Table 2-15. Experience of Borrowing Money

Answers	No. of Farmer	%
Yes	453	94%
No	27	6%
Total	480	100%

Source: JICA Study Team

(2) Lenders

As shown in Table 2-16, 57% of borrowers are depending on private lenders, followed by 37% from MADB. According to the farmers, private lenders in this context mean middleman, and this category includes informal money lenders. It is inferred that most of them probably borrow from various lenders including MADB and private lenders depending on their living condition.

Table 2-16. Major Money Lenders

Money Lenders	No of Farmers	%
MADB	301	66%
Private lenders	137	30%
Relatives	12	3%
Friends	1	0%
Others	2	0%
Total	453	100%

Source: JICA Study Team

Viewed by farm size, there is not remarkable difference among stratum of the farm size as shown in Table 2-17; about 40% of them rely on MADB loan and 50 to 61% on private lenders. This result would imply that even MADB's services have not fully covered in rural area or their services have not matched the demand of farmers.

Table 2-17. Major Money Lenders by Farm Size

Money Lenders	5ac or less	5ac – 10ac	10ac – 15ac	15ac – 20ac	over 20ac
MADB	37%	39%	36%	36%	36%
Private lenders	50%	57%	58%	61%	58%
Relatives	8%	3%	5%	3%	6%
Friends	2%	1%	0%	0%	0%
Others	4%	0%	2%	0%	0%
Total	100%	100%	100%	100%	100%

Source: JICA Study Team

In fact, 99.8% of borrowers presently pay back their debt to lenders. The amount of repayment averages kyat 1.7 million, with a maximum of kyat 20 million and minimum of kyat 5,000. This average repayment amount of kyat 1.28 million accounts for around 32% of the average annual income.

Table 2-18. Do you still pay back?

	No of Farmers	%
Yes	452	99.8%
No	1	0.2%
Total	453	100%

Source: JICA Study Team

Table 2-19. How much money do you need to pay back?

	Amount (kyat)
Average	1,278,792
Max	20,000,000
Minimum	5,000
Median	1,000,000

Source: JICA Study Team

(3) Purpose of Borrowing Money

The purposes of borrowing money are summarized as below;

- (a) 100% of the farmers in the sample with experience of borrowing money borrow to procure agricultural materials such as seeds and fertilizers, followed by educational purposes with 10%,
- (b) This situation is almost the same in all three areas and all the farm size categories,
- (c) The demand for agricultural finance is high; however, most of the loans are used for only agricultural inputs and loans for agricultural machinery are limited, representing only 2%.

Table 2-20. Purpose of Borrowing

Purposes	No. of	%
	Farmers	
Seeds & Fertilizers	451	100%
Education	47	10%
Medical Treatment	19	4%
Foods	18	4%
Agriculture Machinery	7	2%
Business	2	0%
Others	1	0%
Housing	0	0%
No of Borrowers	453	100%

Source: JICA Study Team

Table 2-21. Purpose of Borrowing by Area

Purposes	Shan	Bago	Ayeyar
	south	west	-wady
Seeds & Fertilizers	99%	100%	100%
Foods	3%	6%	4%
Education	12%	9%	8%
Medical Treatment	3%	2%	8%
Business	0%	0%	2%
Agriculture Machinery	3%	1%	0%
Housing	0%	0%	0%
Others	0%	0%	0%
No of Borrowers	100%	100%	100%

Source: JICA Study Team

Table 2-22. Purpose of Borrowing by Farm Size

Purposes	5ac or less	5ac – 10ac	10ac – 15ac	15ac – 20ac	over 20ac
Seeds & Fertilizers	99%	100%	100%	98%	100%
Foods	4%	5%	2%	4%	3%
Education	11%	10%	14%	12%	5%
Medical Treatment	4%	3%	7%	6%	2%
Business	0%	0%	1%	0%	2%
Agriculture Machinery	0%	1%	2%	2%	5%
Housing	0%	0%	0%	0%	0%
Others	1%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

Source: JICA Study Team

(4) Kind of Agricultural Loans

As for agricultural loans, 349 farmers (77%) out of 453 farmers borrowed from MADB and 254 farmers (60%) borrowed from private lenders. MADB plays a major role in the area of agricultural loans rather than private lenders. However, the result also revealed that many farmers access both MADB and private lenders. In fact, some of the farmers said that they borrow money from private lenders while they wait for money from MADB. In other cases, farmers sometimes borrow money from private lenders to pay back to MADB. This result also indicates that farmers borrow money from several different lending sources for agriculture, even including relatives and NGOs such as PACT.

Table 2-23. Lending Sources for Agriculture

Money Lenders	No. of Farmers	%
MADB	349	77%
Private lenders	274	60%
Relatives	38	8%
Others	9	2%
NGOs	4	1%
Total Borrowers	453	100%

Note: 453 Borrowers, Multiple answers

Source: JICA Study Team

(5) Loan Conditions

For private lenders, as shown below, interest rates are varied depending on the mortgage that borrowers offer. Out of 267 samples on the private lenders, 3% to 5% per month is the most frequent rate, and 0.5% to 1.0% per month in the case of MADB loan. NGOs apply 2% to 3% per month, which is slightly lower than the case of relatives as a whole.

Table 2-24. Interest Rate of Each Money Lender

Interest (%/month)	MADB	Private lenders	Relatives	NGOs	Others
0.5% or less	0	4	3	0	0
0.5 - 1.0	348	6	0	0	1
1.0 - 1.5	0	1	0	0	0

1.5 - 2.0	0	6	2	0	1
2.0 - 3.0	0	32	3	4	3
3.0 - 5.0	0	123	10	0	2
5.0 - 8.0	0	65	12	0	2
8.0 - 10.0	0	30	8	0	0
Total Borrowers	348	267	38	4	9

Source: JICA Study Team

For the repayment period, 208 farmers out of 346 are concentrated on 6 to 8 months for MADB's seasonal loan, and similarly 4 to 6 months for private lenders. In general, repayment period in the case of a NGO's loan is longer than those of MADB and private lenders.

Table 2-25. Repayment Period

Period (months)	MADB	Private lenders	Relatives	NGOs	Others
2 or less	1	4	0	0	0
2 to 4 months	6	31	8	0	1
4 to 6 months	121	122	13	0	2
6 to 8 months	208	67	13	0	1
8 to 10 months	7	26	0	1	0
12 months	3	24	3	1	2
24 months	0	0	0	1	0
Total Answers	346	274	37	3	6

Source: JICA Study Team

(6) Types of Loan

All sample farmers replied that they borrowed the seasonal loan for cultivation to purchase seeds, fertilizers, chemicals and to pay for farm labor. The user of the term loan mainly for purchasing agricultural machinery is only one out of 422 samples.

Table 2-26. Agricultural Loan Type

Type	No. of Farmers
Seasonal loan	421
Term loan	1
Total	422

Source: JICA Study Team

(7) Frequency of Borrowing the Seasonal Loan

The following table shows that 99% of 451 farmers borrow the seasonal loan every year. This means that most of the famers do not have savings for the coming cropping season, and for this reason, the demand for the seasonal loan is also high.

Table 2-27. Do you borrow seasonal loan every year?

Answers	No. of Farmers	%
Yes	448	99%
No	3	1%
Total	451	100%

Source: JICA Study Team

(8) Months to Borrow and Repay Loans

According to the general cropping season in the areas, most farmers prepare their farmland between April and July. Indeed, most of the sample farmers borrow money during this period. The largest number of farmers borrowed in June with 128 farmers followed by 110 farmers in July. Meanwhile, repayment is done in the months of December to February. Farmers usually harvest and sell their agricultural products during this period in all three areas. The largest number of farmers pays back money in February followed by 133 farmers in January. It is important to note that these schedules are not the same in every year since the rainfall pattern is different every year. From this point of view, it is important for farmers to secure money as soon as possible when they need to start cultivation.

Table2-28. Borrowing Month

	No.of Farmers	%
Jan	6	1%
Feb	6	1%
Mar	10	2%
Apr	52	11%
May	70	15%
Jun	127	28%
Jul	110	24%
Aug	47	10%
Sep	2	0%
Oct	19	4%
Nov	0	0%
Dec	4	1%
Total Borrowers	453	100%

Source: JICA Study Team

Table2-29. Repayment Month

	No.of Farmers	%
Jan	133	29%
Feb	136	30%
Mar	19	4%
Apr	18	4%
May	3	1%
Jun	9	2%
Jul	10	2%
Aug	15	3%
Sep	11	2%
Oct	17	4%
Nov	13	3%
Dec	69	15%
Total Borrowers	453	100%

Source: JICA Study Team

(9) Ease of Borrowing

Out of 452 borrowers, 67% (305 farmers) answered that it is easier for them to borrow money from private lenders than to borrow money from MADB. Although farmers have to pay high interest rates to private lenders compared to MADB, they borrow money from private lenders as well. This is same for farmers in all three areas and all farm size categories.

Table 2-30. Which is easier to borrow?

Answers	No. of Farmers	%
MADB	147	33%
Private lenders	305	67%
Total	452	100%

Source: JICA Study Team

The reasons for choosing MADB is its “Low interest rate” with 115 farmers out of 144, and “Easy” for private lenders with 300 farmers out of 305. The result shows that farmers borrow from MADB because their interest rate is low; however, they also borrow from private lenders even though they have to pay higher interest rates because they can easily get money from private lenders.

Table 2-31. Reasons for choosing MADB and Private Lenders

Reasons	MADB	Private lenders
Easy	11	300
Low Interest	115	1
Enough Amount	1	1
Others	17	3
Total	144	305

Source: JICA Study Team

(10) Borrowers Satisfaction with MADB

Table 2-32 shows that most of the borrowing farmers are not satisfied with MADB’s seasonal loan in terms of loan amount per borrowing. Based on the result of this survey, the average production cost for paddy field is nearly kyat 200,000 per acreage; yet, MADB can finance only kyat 100,000. The result seems to reflect this situation so that 95% of the farmers answered “No” to the question of “Are you satisfied with MADB?”.

Table 2-32. Borrower Satisfaction with MADB

Answer	No. of Farmers	%
Yes	22	5%
No	426	95%
Total	448	100%

Source: JICA Study Team

The reasons of such dissatisfaction were mainly on: 1) number of days from the time of loan application till actual receipt of loan, 2) complicated procedure and 3) low maximum loan amount. More than 90% of the reasons of borrower’s dissatisfaction on MADB’s Seasonal Loan are occupied by these 3 reasons (refer to Page 34 of Annex-I). It is noted that the issue of the repayment period was not particularly pointed out by farmers who are not satisfied by MADB. This may be due to the fact that almost all farmers in the study area who use MADB are Seasonal Loan clients, and repayment is usually made at the time of harvest within the same cropping season.

(11) Current Debt Status

Of the 480 sampled farmers, the farmers who own over 10 to 15 ac. have the largest debt of kyat 3.56 million on average and the smallest in the category of 5 ac. or less at kyat 731,756. As for area basis, the farmers in Ayeyarwady have the largest debt, followed by those in Shan State.

Table 2-33. Current Debt Status by Farm Size

(Unit: kyat)	5ac or less	5ac – 10ac	10ac – 15ac	15ac – 20ac	over 20ac
Average	731,756	1,239,934	1,520,833	1,924,082	3,568,750
Max	7,000,000	4,000,000	5,000,000	5,000,000	20,000,000
Minimum	20,000	70,000	150,000	80,000	100,000
Median	500,000	1,000,000	1,350,000	1,900,000	2,100,000

Note: Interviews were made from end of August to early September.

Source: JICA Study Team

Table 2-34. Current Debt Status by Area

(Unit: kyat)	Total	Shan south	Bago west	Ayeyarwady
Average	1,605,371	1,587,539	1,481,897	1,756,303
Max	20,000,000	20,000,000	10,000,000	8,000,000
Minimum	20,000	20,000	70,000	100,000
Median	1,000,000	1,000,000	1,000,000	1,500,000

Note: Interviews were made from end of August to early September.

Source: JICA Study Team

Table 2-35 shows current debt to average annual income ratio. As a whole, debt to income ratio ranges from 26% to 69%. The largest ratio is 69% for the farmers with 10 ac. to 15 ac., while the smallest ratio is 26% for the farmers with over 20 ac. Other farm size categories are at around 35%. Debt to income ratio is relatively small for large scale farmers with over 20 ac. It is assumed that the large scale farmers already have their own funds. Therefore, the demand for agricultural finance seems to be larger for the farmers with 20 ac. or less farm land compared to the large scale farmers with over 20 ac.

Table 2-35. Current Debt to Average Annual Income Ratio

	5ac or less	5ac - 10ac	10ac - 15ac	15ac - 20ac	over 20ac
Average Annual Income (kyat/year)	2,023,873	3,572,145	5,575,121	6,195,784	13,712,986
Average Debt	731,756	1,239,934	1,520,833	1,924,082	3,568,750
Debt to Income Ratio	36%	35%	28%	31%	26%

Source: JICA Study Team

(12) Emergency Loan

For the question of “Where do you borrow urgent money?”, 279 farmers out of 447 samples replied that they would borrow from private lenders rather than MADB and relatives. Considering that a MADB loan is mainly for farming, it is natural for farmers to choose private lenders and relatives who can offer cash quickly in response to the farmer’s request, though interest rate is higher.

Table 2-36. Where do you borrow urgent money?

Money Lenders	No. of Farmers	%
MADB	18	4%
Private lenders	279	62%
Relatives	97	22%
Friends	53	12%
NGOs	0	0%
Others	0	0%
Total	447	100%

Source: JICA Study Team

(13) Needs for Loans to Purchase Agricultural Machinery

Table 2-37 shows which machines farmers desire to purchase in two study areas.

Table 2-37. Farmers' Desired Agricultural Machinery

	Ady. Delta	Shan
2-wheel power tiller	57%	56%
4-wheel tractor	8%	25%
Hand sprayer	0%	1%
Motor sprayer	1%	1%
Truck	5%	8%
Combine	20%	3%
Thresher	6%	3%
Milling machine	0%	1%
Others	0%	1%
Pump	2%	0%
Total	100%	100%

Source: JICA Study Team

From the table above, it is observed that 2-wheel power tiller, 4-wheel tractor and combine are the most wanted machinery in these two areas. Though desire to have 2-wheel tractor is high in both areas, while farmers in Ayeyarwady Delta have a preference for combines, and farmers in Shan State have a preference for 4-wheel tractors.

However, currently farmers in the study areas have financial burdens and it may be difficult for them to save money to purchase the agricultural machinery they desire, considering that almost all farmers use the MADB seasonal loan every year as indicated in Table 2-27. This means that an MADB term loan will be appreciated by farmers to satisfy their needs for farm mechanization.

6-2. Constraints in Agricultural Finance

Based on the analysis of the Farm Household Economy Survey described above, the following constraints are identified on agricultural finance in the study areas:

- (1) On the Farm Household Economy Survey made during the Study for 480 samples in Ayeyarwady, Bago and Shan State, 94% of farmers have experience of borrowing money. This implies that borrowing money is a common practice for agriculture in rural areas.
- (2) It takes two (2) months at least, six (6) months in maximum from the application to receiving the loan; consequently farmers cannot cultivate farmlands in exact timing with rainfall.
- (3) Presently Term Loan of MADB is not in operation, therefore only Seasonal Loan is available for farmers. The maximum loanable amount per acre was increased to 100,000 kyat for FY2012/13 for paddy farmers, but many opinions were raised during the Farm Household Economy Survey, such as:
 - When a branch office of MADB is not available near the village, local transport expenses are also necessary for farmers.
 - Maximum loan limit is not enough for standard input of kyat 250,000 to 300,000 per acre in the case of paddy farming.
 - MADB requests borrowers to pay back with a single lump sum payment. If borrowers cannot pay back in time, farmers have to borrow from private lenders at higher interest rates to supplement the balance due, which will result in increase of debt for the farmers.
- (4) It is also revealed by the Survey that non-agricultural incomes are very limited in the rural area. Also, except large-scale farmers, farmers are not able to save for new investments such as purchase of agricultural machinery.

7. Farm Mechanization in the Study Area

7-1. Situation of Farm Mechanization

(1) National Level

The agricultural machinery most popularly used both in upland and paddy field in Myanmar is the power tiller equipped with two wheels and engine of about 22 horsepower (HP). As of March 2012/13, 227,489 units are used in the country. The power tillers are used extensively in Ayeyarwady

Region with 73,815 units, followed by Sagaing Region, Bago West, Bago East, and Yangon, while the 4-wheel tractor is used in Bago East, Yangon, and Shan South.

On the contrary to the power tiller, only 11,119 units (2012/13) of the 4-wheel tractor are used in the country. Numbers of the 4-wheel tractors are observed in Bago (east), Yangon and Shan south areas. Considering the share of planted area with paddy in Shan area, the 4-wheel tractor is being used both in paddy farming and upland.

AMD (Agricultural Mechanization Department) and MOI (Ministry of Industry) are manufacturing agricultural machinery such as power tillers and pumps. For power tillers, AMD produced 2,985 units in 2011/12, and MOI plans to produce 3,000 units respectively in the same year. As semi-finished products, power tillers are imported from China, and assembled in the country, while 4-wheel tractors are from China, Thailand and India. Private sectors also manufacture power tillers by importing parts and assemble them in factories and shop fronts for sale.

Table 2-38. Term Loan by MADB for Machinery
(Kyat million)

	State/ Region	2011/12	2012/13
1	Kachin	414.95	
2	Kayah	36.34	
3	Kayin	47.64	
4	Sagaing	431.00	
5	Taninthathayi	139.58	
6	Nay Pyi Taw	6.07	
7	Bago (east)	1,378.43	31.22
8	Bago (west)		
9	Magway	304.59	19.16
10	Mandalay	643.87	
11	Mon	140.26	14.76
12	Rakhine	102.56	
13	Yangon	389.60	
14	Shan (east)	325.85	22.19
15	Shan (south)		
16	Shan (north)		
17	Ayeyarwady	541.40	
	Total	4,902.14	87.33

Source: MADB (2013)

Table 2-39. Share of Agricultural Machinery Sales

	Number	Share (%)
Production & Sale by AMD	4,500	15
Production & Sale by MOI	2,000	6.7
Good Brothers Co., Ltd	18,500	61.7
Others imported & Sale	5,000	16.7

Source: Data Collection Survey on Agricultural machinery, 2012 JICA

AMD also provides tillage service through their 99 tractor stations deployed in the country, however, compared to the tillage area 14,164,081 acres done by farmer's power tiller and tractor, the area done by AMD's tractor is smaller at 288, 326 acres in 2012/13. It is reported that there are about 2,000 tractors but only 1,200 are in service because most of them produced in 1960 to 1990 have been deteriorating. This situation implies that most of farms (above 80% according to MOAI) are cultivated mainly by a pair of bullocks still now.

Marketing of agricultural machinery is mainly handled by the private sector, topped by Good Brothers Co., Ltd., accounting for 61.7% in 2012, which has many branch offices in the country.

As for the situation of the promotion of farm mechanization by machinery, the numbers of 4-wheel tractors is gradually decreasing due to the deterioration of existing units, while numbers of 2-wheel power tillers are increasing notably. Also, engine thresher and combine harvester are rapidly increasing in numbers. The reasons for such exponential increase are mainly the shortage of farm manpower and increase of wages in agricultural area, and also increase of crop intensity. Such increase was made also due to the replacement of deteriorated existing units which were not durable. Increase of combine harvester numbers is mainly due to procurement by rice dealers which have been expanding their business recently.

Table 2-40. Increase of Agricultural Machinery

Machinery	2011-12 (unit)	2012-13 (unit)	Increase (%)
4-Wheel Tractor	12,652	11,119	87.9
2-Wheel Power Tiller	188,500	227,489	120.7
1-Wheel Power Tiller	6,296	No data	-
Roller Boat	4,372	4,809	110.0
Engine Thresher	38,284	48,520	126.7
Combine Harvester	200	307	153.5

Source: Myanmar Agriculture in Brief (2011-12), AMD (2012-2013)

The detailed situations of agricultural machinery by type are as follows:

(a) 1-Wheel Power Tiller, 2-Wheel Power Tiller, Roller Boat

Among the various farm machinery, the 2-wheel power tiller has the most sales. For farmers to purchase a power tiller, price is usually prioritized over durability, and Chinese brands are consequently preferred by farmers. Such preferences are also supported by the availability of spare parts, powerfulness, and also because they are usually riding types for easier work in paddy field. Their versatility is also preferred since farmers usually use a power tiller as source of power for water pumps and generators by connecting it through a V-belt.

Price Range:

- Chinese brand (ChanhChai): US\$1,600 (22hp, for paddy field, with rotary, riding type)
- Chinese brand (DongFeng): US\$2,000 (25hp, for paddy field, with rotary, riding type)
- Japanese brand - Assembled in Thailand (TraChang): US\$2,000 (12hp, for upland, without disc plow, walking type)
- Thai-China brand - Assembled in Thailand (Golden Flying Fish): US\$1,550

(10hp, for upland, without disc plow, walking type)

1-Wheel power tillers, which are not commonly observed in the surrounding countries, are usually used by farmers with less financial power, while the roller boat is commonly used for inundated farmland in the southern part of Ayeyarwady Delta. This machinery is locally assembled with Chinese parts. Price range is between US\$500 to 600 (7PS, diesel engine)

(b) 4-wheel Tractor

In Myanmar, the market for 4-wheel tractors has competition between Chinese, Indian and Japanese brands. Chinese brand tractor such as Lianfakedi with 50 to 90 HP, YTO 35 – 80 HP are commonly sold due to their cost, equivalent to 1/3 of that of Japanese brand. Indian brands, which cost 1/2 of that of Japanese brand, are also popular especially for their durability. Japanese brands are usually sold through special dealers such as Good Brothers and Myo Chit, however recently also sold through new smaller dealers.

Price Range:

- Japanese brand -assembled in Thailand (Kubota) ; US\$20,000 (47hp, 4 cylinder, 4WD)
- Chinese brand (Lianfakedi): US\$8,600 (55hp, 4 cylinder, 4WD)
- Chinese brand (YTO): US\$13,000 (80hp, 4 cylinder, 4WD)
- Indian brand (Indo Farm): US\$11,000 (55hp, 4 cylinder, 2WD)

(c) Engine Unit

Machinery to be used other than tilling are the versatile combine harvester, reaper, thresher, pump and engine unit. Among them, the need for engine units is high due to their multi-purpose uses such as the power source of a truck locally assembled from second-hand parts.

Table 2-41. Major Types of Engine Available

Company	Manufacturer	Type	Power	Origin
Good Brothers Co. Ltd.	Changchai Diesel Engine Co. Ltd.	ZS-1110	22.0hp	China
-do-	Jieneng Diesel Engine Ltd.	ZS-1110 ZL-1100 R-175	22hp 25hp 5-6hp	China
-do-	Sichuan EMEI Diesel Engine Co. Ltd.	EM185N EM190AN	810hp 1112hp	China
-do-	Wuling Diesel Engine Co. Ltd.	S1110	22hp	China
Shwe Tun Co. Ltd.	Jian Dong Diesel Engine Co. Ltd.	JD1110 JD1110 (Radiator)	22hp 22hp (Varied from 5 to 33HP)	China

Source: JICA Study Team

Price Range:

- 10HP Diesel Engine: US\$150
- 22HP Diesel Engine (water cooled): US\$415-450
- 22HP Diesel Engine (radiator type): US\$480-550

(d) Combine Harvester

In Myanmar, head-feeding type combine and versatile type combine are widely observed. Versatile combine harvesters are difficult for individual farmers to procure, while private companies which are expanding their business such as rice miller and rice dealer under MUFCCI may have needs.

Price Range:

Price of combine harvester varies from US\$15,000 (Chinese brand) to US\$37,000 (Japanese brand).

(2) Regional Level

Total numbers of farm machinery in these two regions of Ayeyarwady Delta are as follows:

Table 2-42. Numbers of Farm Machines in Bago and Ayeyarwady

Region/Stage	Tractor		Power Tiller		Power Tiller (1-wheel)		Pump		Power Thresher		Manual Thresher	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Bago (East)	1,978	19%	15,800	8%	0	0%	4,661	3%	1,450	4%	0	0%
Bago (West)	379	4%	16,608	8%	0	0%	10,451	6%	2,204	5%	0	0%
Ayeyarwady	917	9%	73,815	36%	5,945	94%	72,941	40%	19,131	46%	752	34%
	10,490	100%	206,263	100%	6,304	100%	182,880	100%	41,289	100%	2,182	100%

Source: AMD

As seen on table above, Bago Region shows the largest number of farmers who use tractor. Also, Ayeyarwady Region has a large number of farmers who use power tiller, pumps as well as power thresher. From this perspective, these two regions of the Delta area are the advanced area of farm mechanization in Myanmar.

Total numbers of farm machinery in the Shan State are as follows.

Table 2-43. Numbers of Farm Machines in Shan State

Region/Stage	Tractor		Power Tiller		Power Tiller (1-wheel)		Pump		Power Thresher		Manual Thresher	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Shan (East)	66	1%	5,882	3%	0	0%	191	0%	225	1%	14	1%
Shan (South)	1,665	16%	9,604	5%	0	0%	2,724	1%	545	1%	0	0%
Shan (North)	350	3%	3,799	2%	0	0%	516	0%	584	1%	125	6%

Source: AMD

As seen also on the table above, except the use of tractor in the southern part of Shan State, progress in farm mechanization in the State is relatively slow compared to the other two study areas.

Total numbers of farm machinery in these three regions of CDZ are as follows:

Table 2-44. Numbers of Farm Machines in the CDZ

Region/Stage	Tractor		Power Tiller		Pump		Power Thresher		Manual Thresher	
	No.	% against Union Total	No.	%	No.	%	No.	%	No.	%
Sagaing	891	8%	25,754	12%	29,349	16%	8,051	19%	1,065	49%
Magway	631	6%	4,477	2%	10,930	6%	1,113	3%	0	0%
Mandalay	469	4%	10,983	5%	25,570	14%	2,938	7%	0	0%
CDZ Total	1,991	19%	41,214	20%	65,849	36%	12,102	29%	1,065	49%

Source: AMD

As seen on the table above, almost half of the manual threshers are concentrated in Sagaing, one of CDZ Regions.

Farm mechanization has been promoted by the initiatives of the Government through AMD, however, promotion by private sector is in progress at present. According to the information from AMD, 98% of cultivated farmland is tilled by machinery procured through private sector. In the study area, farm mechanization by private sector is common in Ayeyarwady Delta, where 99.2% of 2-wheel power tillers were procured through the private sector.

Table-2-45. Tilled Area by Machinery in the Study Area (2012-13)

Region/State	Tilled area by the Service of AMD (ac)	Tilled Area by Private-Owned Machinery (ac)		Total Tilled Area by Machinery (ac)	% of Tilled Area by Private Owned Machinery (%)
	4-Wheel Tractor	4-Wheel Tractor	2-Wheel Power Tiller		
CDZ-Sagain	28,730	148,754	782,582	960,066	97.0
CDZ-Magway	21,654	155,062	634,157	810,873	97.3
CDZ-Mandalay	32,282	141,572	688,348	862,202	96.3
Shan (South)	19,050	352,170	549,290	920,510	97.9
Bago (West)	29,910	117,703	1,009,117	1,156,730	97.4
Ayeyarwady	35,650	249,392	4,109,841	4,394,883	99.2
Country	288,326	2,410,923	11,753,158	14,452,407	98.0

Source: AMD

As stated, the initiative of the promotion of farm mechanization is shifting from Government to private sector at present, and more than 90% of machinery is procured through the private sector. Based on information from various machine dealers, prospects of sales for 2013 are shown in Table 2-46 below. Some dealers replied that the number of sales in this year increased by 20 to 30% from that of last year.

Table 2-46. Prospects of Sales by Numbers of Machines (2013)

Sales Spot	1-Wheel Power Tiller	2-Wheel Power Tiller	4-Wheel Tractor	Roller Boat	Combine Harvester
Shan State (Htedaung TS, Taunggyi District)	-	2,500	50	-	-
Bago (Pyay TS, Pyay District)	100	2,000	50	100	-
Ayeyarwady Region (Hinthada TS,	500	1,500	30	500	-

Hinthdada District)					
Mandalay Region (Mandalay TS, Mandalay District)	-	4,000	60	-	-
Yangon Region (Hlaing TS) for the sale to Bago and Ayeyarwady Regions	1,000	10,000	500	500	180
Market Size (year)	0.80 mil. US\$	33.60 mil. US\$	13.80 mil. US\$	0.55 mil. US\$	5.06 mil. US\$

Source: Interview by JICA Study Team on Good Brothers Co., Ltd, Myo Chit Co. Ltd, Shwe Tun Co. Ltd., Aung Yadanar Phyo Commercial Co. Ltd., etc.

The prospects for sales shown above, with a market size estimated at more than US\$ 53 Million in the three study areas, are based on the motivation of farmers, supported by the newly approved “Hire Purchase” system wherein a farmer can use a loan from private banking institutions on installment payments with 40 to 50% of down payment.

Among these dealers, Good Brothers Co. Ltd. is the biggest dealer, with 12 shops and 2 factories nationwide, followed by Shwe Tun Co. Ltd, which has 4 shops and 1 factory. Other companies and dealers are also selling machinery but have a limited number of shops compared to these 2 major dealers.

(4) Result of Farm Household Economy Survey

Based on the analysis on the result of the Farm Household Economic Survey which interviewed 480 farmers from August to September 2013, the means employed by each farm practice from plowing to harvesting are shown in Table 2-47 below. As a result of the survey, it was found that around 75% of the farmers use 2-wheel tillers for plowing and harrowing/puddling. By contract, around 80% to 90% of the farmers hire labor for weeding, fertilizing, and harvesting.

However, as shown in Table 2-48, only 14% of the farmers with 5 ac. or less own 2-wheel power tillers and 40% for the farmers with 10 ac. to 15 ac. Hand sprayers are one of the most common agricultural equipment. Even small scale farmers have hand sprayers; 62% with 5 ac. or less and 108% with 5 ac. to 10 ac.

Table 2-47. Farm Practice

Means	Plowing	Harrowing	Weeding	Fertilizing	Harvesting
Cattle	20%	24%	-	-	-
2-wheel power tiller	75%	72%	-	-	-
4-wheel tractor	5%	4%	-	-	-
Hired labor	-	-	95%	79%	98%
Family labor	-	-	5%	21%	2%
Others	-	-	0%	0%	0%
Total	100%	100%	100%	100%	100%

Source: JICA Study Team

Table 2-48. Agricultural Mechanization by Farm Size

Machinery	5ac or less	5ac - 10ac	10ac - 15ac	15ac – 20ac	over 20ac	Total
4-wheel tractor	2%	0%	2%	0%	33%	6%
2-wheel power tiller	14%	40%	70%	90%	136%	60%
Hand sprayer	62%	108%	124%	149%	157%	113%
Powered sprayer	4%	2%	13%	10%	53%	13%
Combine	0%	0%	1%	0%	3%	1%
Thresher	1%	1%	10%	18%	46%	11%
Rice milling machine	0%	4%	3%	10%	16%	5%
Truck	4%	13%	20%	22%	57%	20%
Oil extracting machine	0%	1%	0%	2%	4%	1%
Water pump	22%	36%	60%	69%	143%	57%
Total Sample	100%	100%	100%	100%	100%	100%

Source: JICA Study Team

The following table shows the differences between annual average income of owners and non-owners of machinery in two areas.

Table 2-49. Difference of Income by Ownership

Area		4-wheel tractor		2-wheel power tiller	
		with	without	with	without
Delta	Income	20,564,583	5,637,699	8,394,158	3,536,957
	Ratio	3.65	1.00	2.37	1.00
Shan	Income	19,650,000	4,285,022	6,597,661	3,533,664
	Ratio	4.59	1.00	1.87	1.00

Source: JICA Study Team

The table shows that a difference of annual income by ownership of tractor is more significant than that of power tiller in both two areas.

7-2. Major findings on Farm Mechanization

Based on the analysis of the result of the Farm Household Economy Survey, interviews with various stakeholders such as AMD, private dealers, machine manufacturers and agro-processing companies, etc., the major findings on farm mechanization are as follows:

- (1) 2-wheel power tillers are widely used by the farmers who own machinery, followed by 1-wheel power tillers rather than 4-wheel tractors. Sprayers are also used widely but powered sprayers are few,
- (2) Agricultural mechanization has been prevailing in paddy farming areas more than upland areas,
- (3) In addition to individual ownership of machinery, large scale farmers, who have contracts with the contract farmers, provide cultivation services for them from plowing to harvesting. In this case, there are two methods of operating machinery; one is done by the operator of the company and the other by the contract farmers themselves.

- (4) Agricultural machinery is owned by individual farmers in most cases, and collective use is not observed. Cultivation service using agricultural machinery is done by farmers who own machinery.
- (5) Most of the agricultural machinery (body and engine) used in the country is manufactured in China, though a few of the machinery produced in India, Thailand and Taiwan are also used. Farmers recognize quality, durability and usability of machinery made in Japan but are deterred by their high price.
- (6) In fact, however, cultivation by draft cattle is still now predominant, especially in the Central Dry Zone.
- (7) When purchasing agricultural machinery, farmers use mainly their own money, followed by “own money plus funds from private lender”
- (8) The major constraints when purchasing agricultural machinery are the lack of fund, the small size of MADB loans, and the required repayment period.

8. Implications of the Consideration of TSL Scheme

Based on the characteristics of three (3) study areas, result of Farm Household Economy Survey and situation of farm mechanization stated above, the following viewpoints shall be taken in to consideration on the set-up of Two-Step Loan Scheme, both for farm mechanization and agribusiness promotion.

8-1. Ayeyarwady Delta

It is noted that in the Delta, farmland area in upland is the smallest while that of lowland is the largest among the three study areas. This may indicate that there are strong needs of farmers for the 2-wheel power tiller which is suitable for the cultivation in lowland.

This analysis may be reinforced by another data from Farm Household Economy Survey on the income and farm size of individual farmers. The data shows that on the average annual income by farm size, farmers with farmland of 15-20 ac. in the Delta gain higher annual income. Incomes of farmers with more than 20 ac. are high in both Delta and CDZ, however, that of 15-20 ac. in Delta is the highest among the three study areas. This tendency also shows that the farmers in the Delta may have potential financial capacity for them to use TSL scheme to purchase more 2-wheel power tillers for the modernization of their farms as compared to other 2 study areas.

As stated in previous section, farm mechanization by private sector is common in the Delta, where 99.2% of 2-wheel power tillers were procured through the private sector. By the strong needs of farmers for 2-wheel power tillers and advantage of existing set-up to involve private sector (machinery dealers) for the farm mechanization, the proposed promotion activities during the proposed TSL scheme shall emphasize participation of the private sector in the Delta, such as participation of MADB branches for the exhibitions/workshops held by the private dealers, and contrarily, participation of private dealers for MADB's promotion activities on new TSL Scheme.

It shall be also noted that in the Delta, number of rice farmers are the largest in the three study areas. Therefore promotion activities by MADB shall emphasize effort on the increase of machinery sales also for combine harvesters on which potential users are the largest in the three study areas.

Also, it is noted that livestock sector is promising in the Delta. Based on the result of Farm Household Economy Survey, livestock sector in the Delta is characterized by its diversity since livestock farmers in the delta are raising various kind of animals (cattle, pig, goat, duck and chicken). Thus, agribusiness entities in livestock sector such as processing, packaging and shipping etc. can become also potential end-user of loan for agribusiness sector in this new TSL Scheme.

8-2. Shan South

By the comparison of three study areas, it was found out that in the Shan south, small-scale farmers are dominant in terms of their possession of land (cultivation right). By the classification of farmers by farm size, the percentage of sample farmers in Shan state is the largest as compared with other two study areas, in the category of less than 5 ac., 5-10 ac. and also 10-15ac.

This tendency shows that it may be difficult to expect many farmers in Shan state to purchase large farm machinery by using this new TSL scheme. Therefore it requires MADB's continuous effort to promote purchase of small farm machinery for these farmers. For such promotion activities, it may be advantageous to set new TSL process similar to existing Term Loan, to avoid promoting works to become burden to MADB branches. Branches in Shan state have experience of processing 325.85 million kyats of Term Loans in 2011/12, therefore such experience can contribute to activities to promote small-scale farm machinery to the farmers with limited farmland in Shan.

Another aspect noted is the low income of farmers in Shan State found during the Farm Household Economy Survey. For the set-up of TSL scheme in Shan State, explanation of new TSL to farmers shall also include technical viewpoints such as long-term advantages of purchasing farm machinery

by loan, possibility of utilizing manpower to the production of new crops by saving existing manpower by farm mechanization, etc.

As for the loan for agribusiness promotion, Shan state has the largest potential as compared to other two areas, due to the diversity of agriculture in Shan state found by the Farm Household Economy Survey. Especially for vegetables and fruits, various stages of the supply chain may require investment by purchasing machinery and facilities for collection, storage, processing and transportation.

8-3. CDZ

In contrary to Ayeyarwady Delta, the percentage of upland farmers is the largest in the study area. Also, the percentage of farmers with less than 5 ac. of farmland is the lowest, as observed on sample farmers in Farm Household Economy Survey. This tendency may indicate that use of new TSL can be expected by farmers to purchase small farm machinery.

Due to the limitation of both number of farmers and planted area of rice in the CDZ, promotion of farm machinery for paddy production in large farmland (such as combine harvester) may be difficult. However the purchase of 4-wheel tractors which have versatility to be used for the production of legumes and oil crops has good potential.

It is also noted that the annual income of farmers with farmland more than 20 ac. is the highest among the three study areas. The purchase of farm machinery by these middle-scale farmers can be a driving force to promote farm mechanization in entire area.

For the promotion of loans for agribusiness, the livestock sector in the CDZ has good potential, especially for cattle raising, which is dominant in the CDZ, as shown by the Farm Household Economy Survey. Investment for improvement in this sector can be also expected, such as construction of new barns, etc.

CHAPTER 3 Agribusiness in Myanmar

1. Importance and Challenges of Agribusiness⁸ in Myanmar

The main economic sector in Myanmar is agriculture. Due to the importance of agriculture in the country, a number of associations related with the agricultural sector are members of the Republic of the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI).

As a staple food of the Myanmar people, rice/paddy industry has been connected culturally, traditionally and socio-economically with most of the population. Therefore, rice/paddy is the most important agricultural crop in Myanmar, and four associations, the Myanmar Rice Millers' Association, Myanmar Rice & Paddy Traders Association, Myanmar Paddy Producer Association and Myanmar Rice Industry Association, are affiliated with UMFCCI (Table3-1).

Table 3-1. Trade Associations Affiliated with UMFCCI

No.	Name of Association
1	Myanmar Rice Miller's Association
2	Myanmar Pulses, Beans & Sesame Seeds Merchants Association
3	Myanmar Rice & Paddy Traders Association
4	Myanmar Edible Oil Dealers Association
5	Myanmar Forest Products & Timber Merchants Association
6	Myanmar Industries Association
7	Myanmar Fisheries Federation
8	Myanmar Printers & Publishers Association
9	Myanmar Customs Brokers Association
10	Myanmar Livestock Federation
11	Myanmar Women Entrepreneurs Association
12	Myanmar Pharmaceuticals & Medical Equipment Entrepreneur Association
13	Myanmar Gold Entrepreneurs Association
14	Myanmar International Freight Forwarders' Association
15	Myanmar Mercantile Marine Development Association
16	Myanmar Paddy Producer Association
17	Myanmar Plastic Industries Association
18	Myanmar Marine Engineer Association
19	Myanmar Farm Crop Producer's Association
20	Myanmar Garment Manufacturers Association
21	Myanmar Computer Industry Association
22	Myanmar Fruit and Vegetable Producer and Exporter Association
23	Myanmar Agro Based Food Processors and Exporters
24	Myanmar Onion, Garlic and Culinary Crops Production and Exporting Association
25	Myanmar Rubber Producer's Association
26	Myanmar Perennial Crop Producers' Association
27	Myanmar Sugar Cane and Sugar Related Products Merchants and Manufacturers Association
28	Myanmar Gems and Jewelry Entrepreneurs Association
29	Myanmar Travel Association
30	Myanmar Petroleum Trade Association
31	Myanmar Rice Industry Association
32	Myanmar Construction Entrepreneurs Association
33	Myanmar Hotelier Association
34	The Highway Freight Transportation Services Association
35	Myanmar Real Estate Services Association
36	Myanmar Oil Palm Producers' Association

Source: UMFCCI

⁸ Several definitions of the term "agribusiness" exist in the literature. In this report, the term agribusiness denotes agriculture and agricultural related business activities, covering the multiple functions and processes.

In 2003, rice export by the private sector was allowed, and then the amount of rice export recovered gradually. Besides significant progress in democratization and liberalization, the Government reduced export tax on agricultural products from 10% to 2% in 2011. As a result of these policies to encourage agricultural product exports, the total amount of rice export reached 0.7 million tons in 2011/12 (Ministry of Planning and Economic Development). Myanmar white rice is being exported to Bangladesh, Malaysia, Sri Lanka, African countries and Middle Eastern countries.

In the context of earning foreign currency by rice exports, agribusiness companies related with rice/paddy are key entities. On the other hand, information obtained from the Myanmar Rice & Paddy Traders' Association (MRPTA), suggests that several difficulties are faced in exporting rice:

- Low rice quality
 - unpleasant appearance
 - uneven grain size
 - uneven milling degree
- Weakness in using machine in the post-harvesting activities
 - sun crack and low quality due to weather changes in paddy sheaves after harvesting
 - combine harvesters are required in the harvest time
- Lack of skill in storage, milling and handling

Post-harvest losses in paddy operations are also noted (Table 3-2). Post-harvest losses in paddy caused by traditional system are observed in the process of hand working and old technologies. This is estimated to account for 25-30% post-harvest losses at the milling stage in traditional operations. Investments in post-harvest technology are required to reduce field losses and improve milling recovery and grain quality.

Table 3-2. Post-harvest Losses in Paddy Occurring in Traditional Operations

Operations	Post-harvest Losses
Harvesting by hand	1-5%
Threshing by hand	1-5%
Sun drying	3-5%
Storage	5-10%
Milling by stone	25-30%
Total	35-50%

Source: MRPTA

As the above example, there are issues needing to be overcome, and the role of agribusiness is important for agriculture and rural development in the country. Hereinafter, two cases of agribusiness will be described to extract the implications for the TSL Project for Agriculture and Rural Development in Myanmar. Then the importance of the value chain and the role of agribusiness in Myanmar will be discussed.

2. Case Study I: Business Models of Fertilizer Companies

As observed from the result of the Farm Household Economy Survey, farmers in the study area have needs for funds to purchase fertilizer. In response to such needs, some efforts are currently being made, mainly initiated by private sector.

2-1. Business Model of Chemical Fertilizer Company

As compared to the surrounding countries such as Thailand and Vietnam, yield, farm gate price and income from rice production is still low in Myanmar. This is partially due to the shortage of agricultural inputs.

Table 3-3. Paddy Production and Agricultural Inputs in Myanmar, Thailand and Vietnam

Item	Myanmar	Thailand	Vietnam
Paddy Yield (ton/ha)	Average 2.6 Monsoon 2.5 Summer 3.2	3.5	4.5
Paddy Farm Gate Price (US\$/ton)	170	350	270
Paddy Farm Income (US\$/ha)	425	1,225	1,215
Agricultural Land (million ha)	11.98	19.75	10.07
Fertilizer Consumption (million ton)	0.8	6	7
Fertilizer Use (kg/ha)	60	300	690

Source: Myanmar Fertilizer, Pesticide and Seed Association
 “Background Paper No.2. Strategic Agricultural Sector and Food Security”

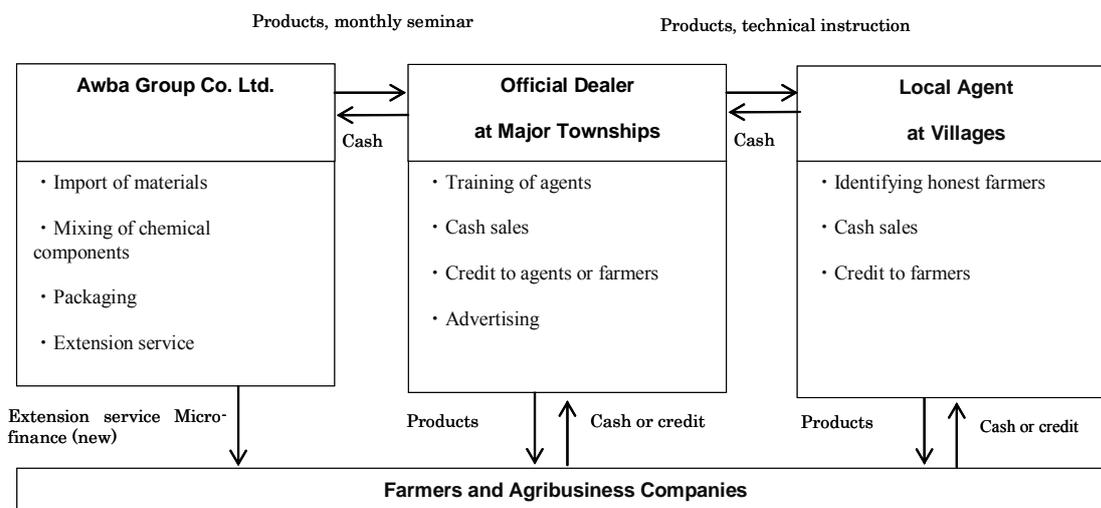
In the past in Myanmar, MPPE (Myanmar Petroleum and Products Enterprise) produced Nitrogen fertilizer, however not in operation at present due to the deterioration of facilities and export policy on natural gas. Instead, large amount of Nitrogen fertilizer are brought from China to Myanmar via Muse. Large scale fertilizer companies usually produce compound fertilizer by importing materials, such as Nitrogen and Phosphate from China and Thailand, Potassium Carbonate from Russia. In the study area, major fertilizer companies, represented by Awba Group Co. Ltd., Diamond Star Co. Ltd. and Golden Key Co. Ltd. are actively promoting sales of fertilizer. According to Myanmar Fertilizer, Pesticide and Seed Association, Awba occupies 40% of domestic market, followed by 10% of

Diamond Star and 7% of Golden Key.

MOAI is mandated to conduct quality inspection and licensing on fertilizer, however, compound fertilizers with low cost and low quality are widely sold. Though Chinese Government increased export tax for chemical fertilizer to 110% on April 2013 for to keep their supply for domestic consumption, a huge amount of low cost Chinese fertilizer is still exported to Myanmar.

Awba, the leading company of fertilizer marketing that entered the market in 1995, has been handling chemical fertilizer, vegetables seeds and chemical pesticide with its annual sales reaching US\$70 million. Awba has exclusive dealer contracts with more than 500 shops, companies and dealers nationwide, and also assigned technical people to their target Townships.

For the technical assistance to farmers, Awba assigns more than 400 agriculturists who are graduates from Yezin Agricultural University as well as retired officials of DOA. Their products are provided to official dealers on a cash basis, and to local agents on credit. Local agents provide these products to farmers, by selecting cash transaction or credit by interest of 2.5% per month. One official dealer usually handles from 20,000 to 50,000 customers (farmers).



Source: Prepared by the Study Team (November 2013)

Figure 3-1. Business Model of Chemical Fertilizer Company

This business model is particularly notable in that sales of compound fertilizer and pesticide are coupled with agricultural extension services. Also, the company can extend credit to farmers by individual trust between farmers and official dealers who are locally trained. On this business model, benefits of both sides are matched wherein increase of farmer's income directly increases the benefit to the company. As result, credit repayment from farmers exceeds 90%.

The agricultural extension services include advice on proper use and amount of fertilizer in

accordance with soil condition and crops, sales of F1 seeds for vegetables, marketing price information, integrated pesticide management, and also guidance to exhibitions at model farms. Agricultural exhibitions were held more than 5,000 times nationwide in 2013.

2-2. Business Model of Organic Fertilizer Company

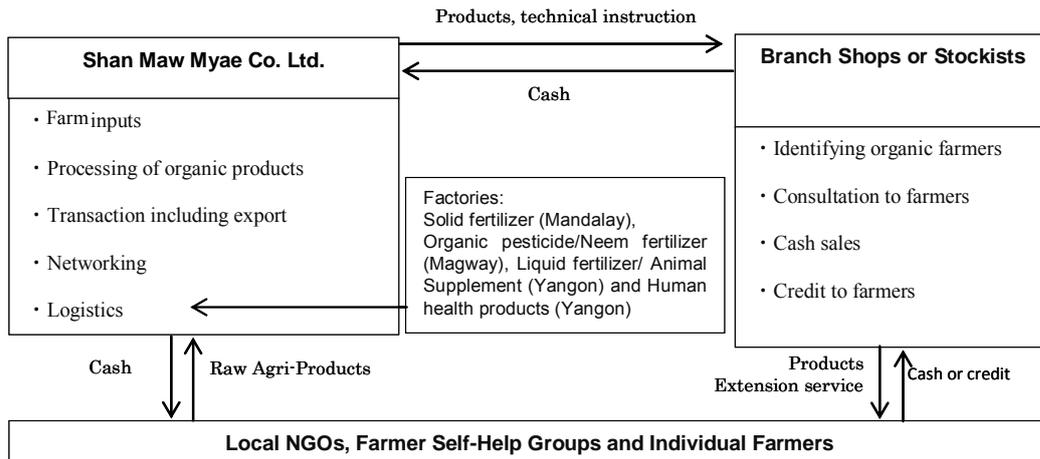
In the study area, activities of private organic fertilizer companies represented by Shan Maw Myae are widely observed. Myae, originated in Taunggyi in 2001, is targeting agricultural business development to increase the livelihood of farmers, using lessons learned from the Japanese business model on organic farming. Their business consists of production, processing, marketing, transportation and technical assistance to farmers, with 22 branch offices nationwide and a network with approximately 70,000 farmers.

Their major products are medicinal herbs, micro-organisms, bamboo vinegar, bio foliar fertilizer, Neem compost, fermented organic fertilizer from waste of oil crops and animal excrement, etc. Aside from these agricultural inputs, health foods such as Noni fruit juice and brewed vinegar as well as rice, peanuts, mangoes and green tea leaf from organic farming groups nationwide are sold in their shops.

On this business model, it is noted that they are assisting farmer's groups and NGOs. Since organic farming is not commonly practiced in Myanmar, they assist farmers by technical instruction of fertilizer management to farmers who purchased their products. For this purpose, more than 200 agriculturists are assigned nationwide, consisting mainly of retired DOA officials.

Some of their business activities are observed in the study areas. For example:

- (a) Myae's products are used for organic horticulture farming in Taunggyi, Shan State under the Inle Lake Conservation and Rehabilitation Project assisted by UNDP and the Norwegian Government. In this attempt, matching efforts are being made between the marketing needs from farmers group and Japanese food company.
- (b) In Pyin Oo Lwin District in Mandalay, dried mangoes are produced, adding value to the products from organic mango plantations.
- (c) In Magway District, Neem oil extraction factory and compost plant are operated in their factory constructed by a 30 years BOT contract with DOA.
- (d) In Patheingyi District in Ayeyarwady Region, Pawsan Hmwe, a famous branded organic rice variety is already sold on a commercial basis.



Source: Prepared by the Study Team (November 2013)

Figure 3-2. Business Model of Organic Fertilizer Company

As stated above, Myae is expanding its business in various aspects for valuable agricultural products through technical assistance to farmers, marketing and processing and value added sales.

3. Case Study II: An Inquiry into High Value-added Rice

The TSL project for Agriculture and Rural Development is planning to support agricultural modernization through financial schemes. Especially, the project intends to provide opportunities for financing of equipment investment to increase agricultural production and added value.

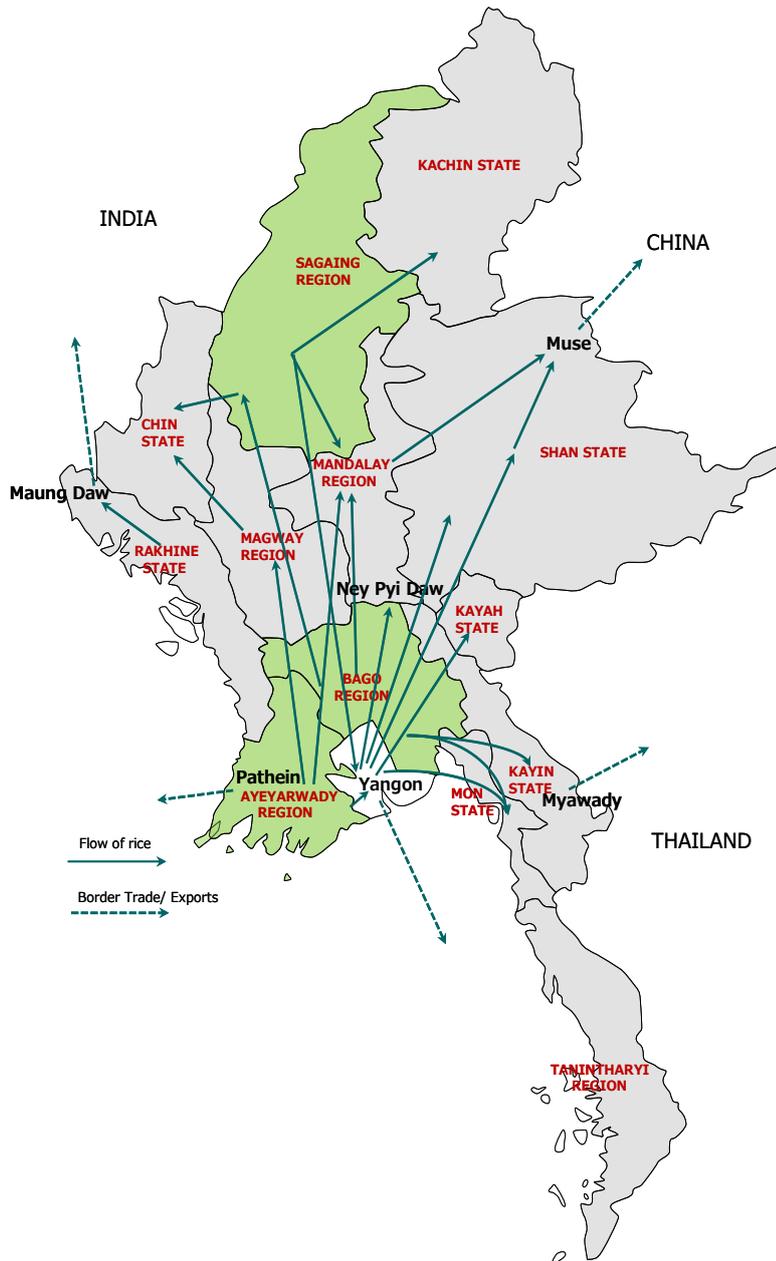
On the basis of the fact that rice is the most important agricultural crop in Myanmar, this section focuses on Shwebo Pawsan which is one of the high-added value rice in their rice markets⁹.

3-1. Overview of Rice Production and Distribution

As a staple food in Myanmar, rice cultivation is observed in the whole country. The main rice producing areas are Ayeyarwady Region, Bago Region and Sagaing Region. On the other hand, the self-sufficiency ratio of rice in Nay Pyi Taw, Chin State, Mandalay Region and Magway Region is low. These areas are heavily dependent on provision from rice production areas. The route of rice production and distribution, according to the previous study, is presented as Figure3-3¹⁰.

⁹ Due to limitations of the study schedule, the field survey on the farmers of Shwebo Pawsan has not been conducted yet. A supplementary survey in this area is needed.

¹⁰ Wong, L. C. Y. and Eh Mywe Aye Wai (2013) "Rapid Value Chain Assessment: Structure and Dynamics of the Rice Value Chain in Burma" Background Paper No.6. Michigan State University. P.23.



Source: Prepared by the Study Team on the basis of Op. cit., Wong, L. C. Y. and Eh Mywe Aye Wai (2013)

Figure 3-3. Trade Flows of Rice in Myanmar

The biggest city in Myanmar, Yangon is the hub of the economy. Yangon is located near Ayeyarwady Region, and is one of the major bases of rice logistics. There are two rice exchange centers in Yangon; one is in Wadan on the waterfront of Yangon River and the other is in Bayint Naung Wholesale Market¹¹. In Wadan, the Rice and Paddy Depot managed by the Myanmar Rice and Paddy Traders' Association has the function of a rice exchange center.

¹¹ Op. cit., Wong, L. C. Y. and Eh Mywe Aye Wai (2013) P.26.

(1) Rice and Paddy Depot in Wadan

The Rice and Paddy Depot has played a prominent role in rice market's efficiency since 1992. The Rice and Paddy Depot opens to members every morning in the weekdays, and the business hours are from 7:00 am to 10:30 am. The members consist of rice traders and retailers. The total number of members is 2,500 as of September 2013. Every morning 170 sellers and 100-300 buyers participate in trading. The sellers present samples¹² of rice for the negotiations with buyers.

Daily volume of trading is 3,000t on the average. The sellers provide 10-12 varieties, and each variety is divided into 8-10 grades. It is evaluated by quality including production area, varieties and grades. The most popular variety is Zeeya which price is 360 kyat/kg. The top price variety is Shwebo Pawsan which price is 700 kyat/kg. Thus the price of Shwebo Pawsan is almost two times the price of Zeeya.

(2) Shwebo Pawsan

Since the 1990s, differentiation by variety has progressed for some types of rice that have a certain added value. The prices of rice are determined by quality and production area. The best example is Pawsan Hmwe, a type of fragrant rice of high quality that is produced in the Ayeyarwady Delta. Especially, Pawsan Hmwe that produced in Phyapon in Ayeyarwady Region was regarded as high quality and priced higher than the same variety¹³.

The staff of the Rice and Paddy Depot in Wadan pointed out that the disaster of Cyclone Nargis caused high level of soil salinity in Ayeyarwady Delta, which resulted in the quality of rice in this area deteriorating. In the meantime, the potential for cultivation of Pawsan in Shwebo in Sagaing Region was observed. Recently, Shwebo has been recognized the production area of Pawsan on behalf of Ayeyarwady Delta. The Shwebo Pawsan means the variety of Pawsan cultivated in Shwebo, and the Shwebo Pawsan becomes a high quality rice variety in Myanmar¹⁴.

3-2. Milling, Sorting and Shipping of the Shwebo Pawsan

According to a rice trader in Shwebo, Pawsan was introduced from Pathein with the improvement of irrigation system around the early 2000s in Shwebo. The Shwebo Pawsan needs longer growing period comparing to other varieties, so this variety has been cultivated in the rainy season. From the viewpoint of farm operation efficiency, farming systems are in the process of change from traditional ways to modern agricultural practices utilizing power tillers and tractors.

¹² Milled rice and cooked rice are used as samples.

¹³ Okamoto, Ikuko (2005) "Transformation of the Rice Marketing System and Myanmar's Transition to a Market Economy" *IDE Discussion Paper*. No. 43. Institute of Developing Economics, Japan External Trade Organization. P.23-24.

¹⁴ Nay Myo Aung (2012) "Production and Economic Efficiency of Farmers and Millers in Myanmar Rice Industry" *IDE VRF Series*. No. 471. Institute of Developing Economics, Japan External Trade Organization. P.33.

Many farmers are selling their harvest directly to millers without paddy brokers around Shwebo. On the other hand, an interviewed miller hires buyers who typically collect paddy directly from farmers. The miller pay commission fee to the hired buyers. The paddy price of Shwebo Pawsan is 240-270 kyat/kg. Particularly, Shwebo Pawsan produced in several places¹⁵ is priced with premium of 10-20 kyat/kg because of the best eating quality.

Rice with yellow discoloration is detracted the value as edible use. The pricing of these kinds of rice is determined as the livestock feeds. After drying the paddy in the sunshine, rice millers stack paddy bags vertically to prevent yellow discoloration. Recently, sorting machines with a function of color sort are introduced to rice millers in Shwebo. The prices of milled rice are categorized to five classes depending on the intended end-usages. Table 3-4 describes output ratio and price of milled rice after color sorted.

Table 3-4. Output Ratio and Price of Milled Rice after Color Sorting

Class	Output ratio (%)	Price (kyat/kg)	Intended end-usage
O-win	33	680	High quality rice
San Kyaw	10	380	Edible use
San Lat	9	320	Edible use, ingredient for fabricated food
Za Gwe	2	260	Ingredient for beer
Sunt Pyit	2	200	Livestock feed

Source: Prepared by the Study Team (November 2013)

There are several processes from paddy to milled rice, only large mills can process all necessary stages. Some mills engage only removing husks, and some deals sorting rice.

An interviewed miller introduced a new milling machine with sorting function around five years ago. The capacities of the old milling machine and the new milling machine are 25t/day and 60t/day, respectively. Thus the capacity of the new machine is more than twofold as productive as the old one. The power source of the old machine is steam. On the other hand, the power source of the new machine is electricity. The miller erected a private generator in preparation to unexpected blackout. The miller also owns storage barns to adjust the rice shipments to the market demands.

Rice husks are produced as an unavoidable by-product of milled rice. A brick factory located Kanbal township¹⁶ uses the rice husks for fuel.

A rice trader has a business plan to entry into the milled rice sorting project near future. He is

¹⁵ The production area of the premium Shwebo Pawsan is as follows: Tha Lone, Payan, Palaing, Late Chin, Seik Kon and Chi Ba.

¹⁶ The distance between Shwebo and Kanbal is around 45km.

planning to purchase a color sorter with two step selection function¹⁷ from China by own fund. Money on deposit is required to order a color sorter, and the remainder should be paid at the delivery time. Due to the unstable electricity supply, the rice trader has a vision to erect a private generator beside the machine.

The original business of the Shwebo-based rice trader is edible oil and fuel trading. It means that the trader obtains edible oil and fuel in Yangon and sells them to consumers in Shwebo. The trader started to ship rice toward Yangon market to saturate the empty load. The trader obtains the rice by negotiation with millers based on the Yangon market information. The price information is gathered at the Rice and Paddy Depot in Wadan, and provided to the trader by his relative who stays in Yangon. The trader collects the rice within a range of 30km from Shwebo. The collected rice is shipped to Yangon by trucks. The distance between Shwebo and Yangon is around 700km. It takes 24-30 hours by 22-wheel truck and 48 hours by 12-wheel truck, respectively¹⁸.

4. Case Study III: Emergence of Service Contract for Paddy Harvest

Near the city of Yangon, shortage of farm labor is becoming a problem. Especially, the labor shortage in the harvest season is increasingly serious. In a surveyed village¹⁹, farmers are faced with requirements to secure the neighboring labor for the harvesting operation from five months in advance. At the time of recruiting labor, it is required to pay the wages for ten days as deposit²⁰. In addition, this village is located near the mouth of the Yangon River, and many villagers are engaged in fishing with farming. Since the wage of fishing is higher than agriculture, a labor shift to fishery from agriculture is observed²¹. According to the farmers, it was reported that the recruited labors got away before the harvest despite the deposit payment. Due to the delay of harvest work, many paddy fields were still paddy at the proper time for harvesting in many cases, with the result that the paddy was damaged by rats, and quality deterioration of rice occurred. Some farmers estimate that in the case of a manual harvest, the yield of paddy is 1.2t/acre, and loss can be reduced significantly by mechanization, giving a yield of 1.9t/acre from the paddy²².

In response to this situation, a large-scale farmer in the village purchased a combine harvester, and provides a service contract for paddy harvest after the harvesting in own fields. In the case of harvest by hand, it is possible to harvest 1 acre over one day using ten workers. On the other hand, a 70

¹⁷ The price of a color sorter with two step selection function is 34 million kyat. The price of a color sorter with three step selection function is 51 million kyat. The latter is able to treat the high quality rice for exporting.

¹⁸ Number of truck driver is two for 22-wheel truck and one for 12-wheel truck, respectively.

¹⁹ The field survey was conducted in Kyauktan Township located in a distance of around an hour's drive from Yangon.

²⁰ The daily wage for male is 3,000kyat/day with three meals and for female is 2,000kyat/day with three meals, respectively.

²¹ The wage system of fishery is 5,000kyat/day for the daily pay and 60,000kyat/month for the monthly pay, respectively.

²² Since there is no irrigation facility in this village, rice/paddy cultivation is conducted only during the rainy season.

horsepower combine harvester²³ can harvest around 10 acres per day. Costs of the harvest including harvesting, threshing and bagging in the fields are 45,000 to 55,000 kyat/acre. In contrast, service contracts for paddy harvest with combine harvester are available at 40,000 kyat/acre.

The need for service contracts for paddy harvest is higher than harvesting by hand, because there are several advantage points as follows: a) low cost, b) saving operation time, and c) reducing harvest losses. However, from the observation in Chapter 2, the price level of combine harvester is from US\$ 15,000 to US\$ 37,000²⁴. Thus, farmers who could purchase combine harvester with their own funds are limited. In fact, the surveyed village has 1,780 acres of paddy fields, and 150 farm households, but a mere two combine harvesters exist in this village at present. Therefore, as an example, it may be possible that introduction of combine harvesters in suburbs is promoted by medium- to long-term finance for leading farmers who have limited money but have motivation for starting service contracts for paddy harvest. Then it is expected that such activities would contribute to alleviating labor shortage issues at harvesting time.

5. Implications for the TSL Project for Agriculture and Rural Development

As the result of the case study of Shwebo Powsan, it may be pointed out that the importance of value chain improvement to provide high-added value agricultural products to markets. The rice value chain for Shwebo Powsan is organized links among farmers, millers, traders, retailers and other service providers who join together to improve productivity and value added. The role of agribusiness in the value chain is quite important. There are many machines and facilities related to the rice value chain, such as power tiller, tractor, milling machine, sorting machine and storage barn, etc. Therefore, to achieve value chain development should be considered to promote collaboration among players in the chain to generate value for consumers.

On the other hand, there are several issues on rice value-chain in Myanmar. Figure 3-4 illustrates the current rice value-chain and three points of the market weakness.

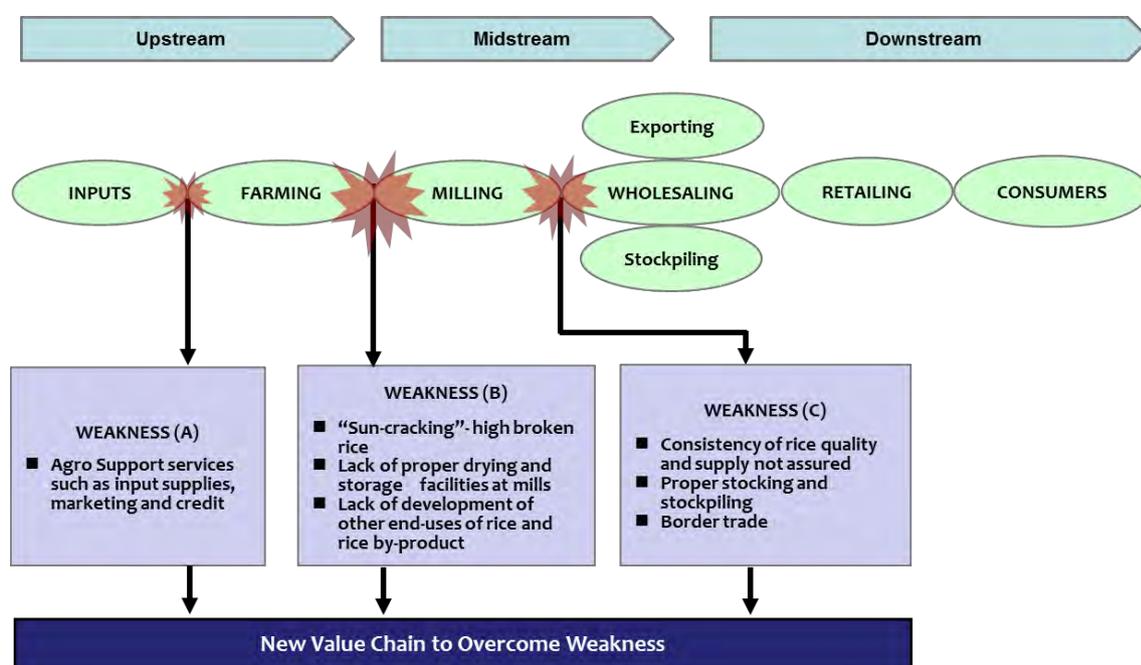
One of the weak points is shortage of agro support services. The Farm Household Economy Survey showed that most of the farmers borrow the seasonal loan from MADB to purchase seeds, fertilizers and chemicals etc. However, it is also pointed out that most of the farmers are not satisfied with MADB's seasonal loan in terms of loan amount per borrowing²⁵. The business model of the chemical fertilizer company that provides credit and extension service may be an example of how to

²³ This combine harvester was made in Thailand by a Japanese company. The purchase price was 30,000,000 kyat.

²⁴ See P.50.

²⁵ See Table 2-32 (P. 42).

complement the MADB’s seasonal loan²⁶. In other words, MADB lends farmers cash based on the seasonal loan scheme, and it may be concerned that if farmers purchase agricultural inputs (fertilizer and pesticide) in low cost and low quality, then the agricultural productivity remains low. Although it requires a new instruction to MADB by MOAI, through the support for agribusiness companies that provide certified agricultural inputs and extension services, farmers can be encouraged to use fertilizers and pesticides appropriately. As the result of this, it is expected that the agricultural productivity would improve step by step. If the TSL project provides loans for agribusiness companies, farmers may access high quality agricultural inputs with the proper technology more easily²⁷. Similar arguments could be applied to other inputs such as seed and pesticide etc.



Source: Prepared by the Study Team on the basis of Op. cit., Wong, L. C. Y. and Eh Mywe Aye Wai (2013)

Figure 3-4. Implication of New Value Chain to Mitigate Weakness

The second weak point is the lack of appropriate facilities such as drying machines and storage barns. In the case of Shwebo, millers and the rice traders erect new machines or facilities to treat the high-added value rice. This example is only a small part of the Myanmar’s rice value-chain. Agricultural products should be treated by appropriate agricultural machines.

The third weak point is consistency of rice quality and supply. From the interview toward the MRPTA, Myanmar allows a situation where there are low-quality rice exporters. In fact, the current main target

²⁶ See Figure 3-1 (P. 60).

²⁷ Agribusiness companies set up exhibition fields on major townships, and hold Farmers’ Field School to provide technological information for agriculture.

of rice export is Bangladesh, Malaysia, Sri Lanka, African countries and Middle Eastern countries to satisfy peoples' appetites. To implement the policies aimed at exporting agricultural products, mechanization in the field of post-harvest technology should be considered.

It is also pointed out that the lack of electricity supply is one of the critical bottlenecks in the value-chain. On the other hand, rice husk is easy to obtain in the rice production area as a by-product of milled rice. Therefore, the possibility of electricity generation systems from rice husk should be recognized.

As described in Chapter 2, similar value chains were observed for other major crops such as maize, oil seeds, pulses, vegetables and fruits²⁸. Potential needs for financing for machinery, warehouses, packing and processing facilities etc. were extracted. The role of agribusiness should be pointed out in the value chain.

Therefore, as the candidates for the end-users/sub-borrowers of this project, agribusiness companies should be considered from the viewpoints of importance in the value chain.

On the other hand, what will happen if debt financing targets of TSL are extended to cover players in the segments of midstream or downstream within the value chain. Administrative jurisdictional issues will arise from our discussion. For instance, it will be the case when we are discussing extension of debt financing targets of TSL in order to include milling company or wholesaling company which may fall in different jurisdictions as the responsibility of other Ministries. In this connection, this matter will be critical in the context of the development of TSL operation both at present and in the future. A seamless cooperative approach among different Ministries is essential, as well as between the public sector and private sector in the host country.

²⁸ See P. 30-35.

CHAPTER 4 Overview and Issues of Banks for Agriculture and Rural Development

1. Business Outline and Lending/Credit Appraisal System of PFI Candidate Banks

Historically, the Myanmar Agricultural Development Bank (MADB) has played the central role in agriculture financing in Myanmar. The MADB dominates the agricultural financing market in Myanmar, while its loan market share is estimated to be approximately 74% in a total market of 736 billion kyat in 2012. At the same time, given the situation that the major industry is the agriculture sector in Myanmar, commercial banks and financial institutions have recently seemed to focus on financing for agribusinesses in Myanmar.

There are currently five candidate banks for a PFI of a TSL project for agriculture and rural development in Myanmar: 1) Myanmar Agricultural Development Bank (MADB); 2) Small and Medium Industrial Development Bank (SMIDB); 3) Global Treasure Bank (GTB; former “Myanmar Livestock and Fisheries Bank”), 4) Kanbawza Bank (KBZ BANK), and 5) Myanmar Economic Bank (MEB).

The business outline and main performance indicators of each PFI candidate bank: The business outline and main performance indicators of each PFI candidate bank are described in the table below.

Table 4-1. Business Outline and Main Performance Indicators of PFI Candidate Banks

(Unit: %, No., million MMK)

	Myanmar Agricultural Development Bank	Small and Medium Industrial Development Bank	Global Treasure Bank	Kanbawza Bank	Myanmar Economic Bank
I. BUSINESS OUTLINE					
1. Year of Establishment	1997 (In 1953, established as State Agricultural Bank)	1996	1996	1994	1976 (In 1954, established as State Commercial Bank)
2. Company Type and Legal Basis	Governmental financial institution supervised by MOAI	Company limited by share (Public)	Company limited by share (Public)	Company limited by share (Non-public)	State-owned bank supervised by MOF/CBM
	MADB Law 1990	Financial Institutions Law 1990, Regulation on FIs Law 1991, Companies Act 1913	Financial Institutions Law 1990, Regulation on FIs Law 1991, Companies Act 1913	Financial Institutions Law 1990, Regulation on FIs Law 1991, Companies Act 1913	Financial Institutions Law 1990, Regulation on FIs Law 1991, State-owned Economic Enterprises Law 1989
3. Capital					

Authorized Capital	5,000	50,000	70,000	100,000	1,000
Paid-up Capital	2,000	20,502	35,000	85,025	420
4. No. of Employees	2,685	495	1,200	7,558	8,000
5. No. of all Branches	221	11	65	118	310
<i>Incl. No. of state/region branches</i>	15	-	-	-	-
<i>No. of township branches</i>	206	-	-	-	-
6. Major Loan Customer by Industry Type					
No.1	Paddy (90.9%)	Manufacturing (37.3%)	Livestock & fisheries (35.0%)	Trading (25.6%)	Construction (44.2%)
No.2	Others (9.1%)	Trade (30.1%)	Trade (32.0%)	Manufacturing (19.9%)	Manufacturing (17.1%)
No.3		Services (7.9%)	Construction (11.0%)	Services (14.8%)	Service (14.5%)
No.4		Construction (6.1%)	Others (22.0%)	Construction (9.6%)	Trading (14.1%)
7. Loans to farmers/Total Outstanding Loans (%)	100.0%	0.0%	35.0%	0.0%	0.0%
8. MLT Outstanding Loans/Total Outstanding Loans (%)	0.0%	0.0%	0.0%	1.9%	0.0%

II. MAIN PERFORMANCE INDICATORS

1. Total Assets	204,145	176,570	480,754	2,491,232	4,532,908
2. Outstanding Loans	193,243	72,262	300,224	1,602,174	740,447
No. of loan customers	2,290,588	495	3,711	6,871	22,100
3. Deposits	14,556	144,127	367,538	2,269,686	3,126,954
No. of depositors	3,000,000	15,377	83,338	729,067	1,000,000
4. Capital Adequacy	11,335	26,561	52,824	136,124	1,056,675
5. Expense ratio to Gross Operating Income (%)	26.3%	25.5%	39.7%	39.8%	40.7%
6. Net operating income	11,524	5,674	15,213	68,042	23,558
Per head	4.3	15.2	12.7	9.0	2.9
7. Profit before tax	9,335	4,391	15,309	47,284	23,558
8. Net profit	2,334	2,972	13,371	30,273	23,558
9. Loan to Deposit Ratio (%)	1,327.5%	50.1%	81.7%	70.6%	23.7%
10. CAR (%)	12.9%	15.0%	32.0%	15.0%	23.3%
11. Current Ratio (%)	44.9%	78.8%	80.6%	87.4%	102.4%
12. NPL Ratio (%)	0.01%	0.21%	1.80%	0.15%	1.68%
13. ROA (%)	4.6%	2.3%	3.2%	1.9%	0.5%
14. ROE (%)	82.4%	16.5%	29.0%	34.7%	2.2%

Note 1: The date in the above table is as of FY2012.

Note 2: Under the regulations of the Central Bank of Myanmar (CBM), "NPL" is defined as overdue loans in default for more than 24 months.

Source: Documents of MADB, SMIDB, GTB, KBZ Bank, MEB and interview with those banks (August – September 2013).

Loan products for farmers in Myanmar: In general, most commercial banks cannot provide loans actively to the agriculture sector in rural areas, mainly because there are following characteristics of agricultural sector in rural areas: 1) higher credit risks including limited access to market and price information, low crop diversification, seasonal cash flow and lack of costs & incomes records; and 2) higher operational risks including low population density, large geographic dispersion, difficult accessibility and seasonal demand. That is also the case for Myanmar. In Myanmar, MADB and GTB are the main banks that have provided loan products for farmers and livestock & fishery businesses as shown in the table below.

Table 4-2. Loan Products of MADB and GTB

Bank	MADB			GTB	
Products	Seasonal Loan			Term Loan	Short-term Loan
	Monsoon (Apr-Aug)	Winter (Sept-Dec)	Pre-monsoon (Jan-Feb)		
Purpose	Working capital/cultivation	Working capital/cultivation	Working capital/cultivation	Working capital, investment (farming machinery, etc.)	Working capital and/or investment
Eligible borrowers	<p>1) The owners of land (cultivation right) certificate issued by the Land Record Department (LRD-MOAI). Illegal farmers who cultivate the “forestry area” are not allowed to apply for the MADB loan.</p> <p>2) Farmers of rice, maize, pulse and beans, oilseed crops, cotton, jute, mustard, sugar cane, groundnut, sesame, etc. Vegetable, fruits, spice are not eligible.</p> <p>3) In case of “Term Loan”, the eligible farmer is a farmer who has agricultural land of more than 5 acre.</p>			<p>Fishery: License holder of Fisheries Department</p> <p>Livestock: Applicant’s land needs to be registered at LRD-MOAI.</p> <p>Fishery and livestock: Recommendation letter from Livestock & Fisheries Department of Ministry of Livestock and Fisheries</p>	
Maturity (Grace period)	1 year or less (cultivation period)	1 year or less (cultivation period)	1 year or less (cultivation period)	1 - 3 year (1 year)	1 year or less (-)
Interest rates	8.5%	8.5%	8.5%	8.5%	13%
Repayment method	Lump sum	Lump sum	Lump sum	Every year	Lump sum, Interest payment every 3 months
Loan amount limit	MMK 1 million	MMK 1 million	MMK 1 million	Decided by individual appraisal	MMK 500 million
Guarantee/Col lateral	Group guarantee (5-10 farmers)	Group guarantee (5-10 farmers)	Group guarantee (5-10 farmers)	Saving accumulation of 30%-50% of loan amount, financed property and real estate (land & house) as collateral, and two guarantors	Any types of property as collateral. If collateral is not sufficient, two guarantors would be required.
Loan disbursement (FY2012)	MMK 426 billion (rice: 95%)	MMK 127 billion (rice: 78%)	MMK 4 billion (rice: 100%)	MMK 13 billion	MMK 300 billion

Note 1: The MADB's total seasonal loan amount of MMK 557,846 million in FY2012 is geographically diversified mainly into Ayeyarwady (30.2%), Bago (22.3%), Yangon (11.9%), Sagaing (10.8%), Mandalay (7.5%), etc.

Note 2: The limit for a rice farmer is MMK 100,000/acre; and MMK 20,000/acre for a sesame farmer, etc. According to MADB, considering the average production costs of rice are MMK 250,000 – 300,000, the loan amount is not sufficient for rice farmers.

Note 3: The disbursement of MADB's Term Loan in FY 2012 is MMK 13,207 million which includes; 1) Short-term (MMK 10,119 million); 2) Farm machinery (MMK 87 million); and 3) Special project (MMK 3,000 million). The short-term loans are classified into four categories: 1) Solar salt production (MMK 50 million); 2) Sugarcane production (MMK 9,223 million); 3) Tea processing (MMK 826 million); and 4) Coffee plantation (MMK 20 million). The total loan amount of MMK 13,207 million is geographically diversified mainly into Bago (24.2%), Shan (19.4%), Magway (10.1%), Sagaing (10.0%), Nay Pyi Taw (7.9%), etc. The main borrowers of Term Loan are large-scale farmers with more than 10 acres which are about 10% of total number of farmers in Myanmar.

Note 4: To exceed the loan limit of GTB would require the permit from the Minister of Finance. In addition, there are other limitations: 1) Up to one third of real estate; 2) The limit for a fish farmer is MMK 500/acre; and 3) The limit for livestock industry is 20% of the Bank's capital adequacy.

Note 5: According to the interview with GTB, GTB's loan portfolio is divided into two categories: 1) working capital (70%); and 2) investment (30%).

Source: Documents of MADB and GTB (August 2013), Interview with MADB in August – September 2013 (HQ, Thanlyin Branch, Kyauk Tan Branch, Thong Gwa Branch), Sanyu Consultants Inc. (May 2013)

MADB has provided loan products mainly to smallholder farmers, who are predominantly engaged in subsistence agriculture. According to the documents of MADB, the number of seasonal loan's clients is 2.26 million that covers 46.8% of total farmers (4.824 million) at the end of FY2012. The total disbursed loan amount of MADB has increased dramatically in the recent years (The loan amount increased from 199,557 million kyat <100%> in FY2010, to 319,218 million kyat <160%> in FY 2011 and 571,053 million kyat <286%> in FY2012). However, the Bank has not fully supported most companies such as agribusiness firms, processors, traders, exporters, transporters, machinery distributors, etc. In addition, although the MADB Law mentions that MADB should focus on “effectively supporting the development of agricultural, livestock and rural socio-economic enterprises in the country by providing banking services”, the Bank does not finance livestock, the production of processed food, fertilizers, forestry activities and other values-added products practically. On the other hand, GTB has tried to serve the livestock and fishery industry in the current loan market of Myanmar.

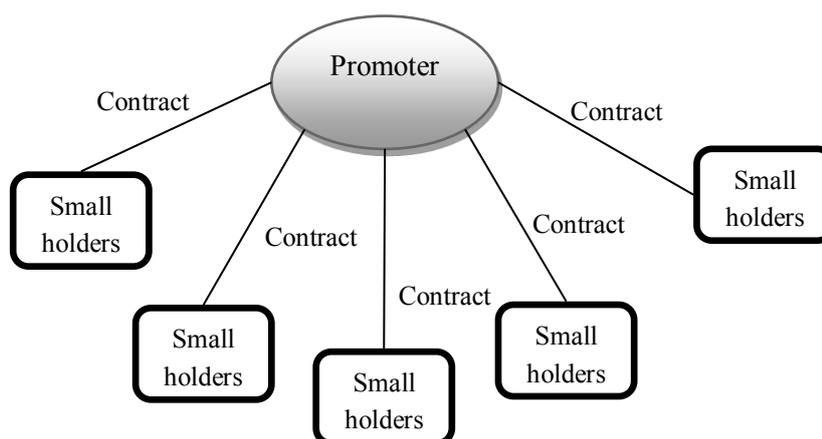
In terms of the “Term Loan” of MADB, according to the Ministry of Agriculture and Irrigation (MOAI)'s regulation in 2012, only the purchase of locally-made machinery was eligible for a MADB loan, while foreign-made machinery was not covered by the loan program. This matter had been the issue among relatively larger-scale farmers who wanted to buy high quality foreign-made machinery. However, the interview with MADB suggests that the regulation was abolished in 2013. The present significant problem is that the “Term Loan” has not been provided since early FY2013. Given the critical situation that MADB has suffered from a lack of capital funds, the Bank has been required to give priority to emerging financial demands for short-term working capital. That is the background for the abolishment of its “Term Loan”. The disbursed term loan amount and number of borrowers have increased in the recent years Specifically, loan disbursements increased from 8,897 million kyat (100%, 10,121 borrowers) in FY2010 to 7,105 million kyat (80%, 9,015 borrowers) in FY2011 and

13,207 million kyat (148%, 30,588 borrowers) in FY2012. However, the disbursed amount of term loan reached to 798 million kyat in early FY2013 and stopped already. This may mean that the farmers have recently lost a chance to get a medium-to long-term loan in Myanmar.

On the other hand, GTB sets a limit to the loan amount. The interview survey suggests that the provided amount for livestock and fishery farmers is 500,000 kyat per acre for fish pond, 30,000 kyat per head for goats & pigs, and 100,000 kyat per head for working cattle farming. But such limited amount does not seem to meet the actual production costs.

Special lending practice for farmers in rural areas: It is commonly recognized that agricultural business has the following four risks: 1) climatic risks; 2) farmer's risks; 3) market risks; and 4) crop risks. In Myanmar, they say that the so-called "village-banking" system had been established and functioned efficiently, where a committee with elected five members had taken care of lending and debt collection procedures by obtaining 2% of loan amount as commission. Since the "village-banking" system was abolished in 1993, MADB has mainly provided loan products for farmers through the "Seasonal Loan" program. This is recognized as a group lending model where MADB provides loan products by requiring 5-10 farmers' group guarantees. According to the interview survey, the debt collection ratio of "Seasonal Loan" program has been almost 100%. This is because the village joint responsibility system functions practically, where if a borrower cannot make repayments, a penalty (e.g. reduction and delay of next loan for the village) would be imposed on the village.

On the other hand, in Bago and Irrawaddy, there are currently some cases of a contracted farming system with a promoter and smallholders. The structure of those cases is described in the figure below. It is widely acknowledged that agricultural financing is possible only when farmers are involved in stable supply chains. In the future, it is expected that the farmers involved in the contract farming system will be able to have access to finance more easily. If the contract farming system is well developed in Myanmar, the bank might be able to provide loans to smallholders involved in the system by requesting promoters to provide with credit guarantees for each contracted smallholder.



Source: Prepared by the Study Team (August 2013)

Figure 4-1. Structure of Contracted Farming System

Financing for farmers’ mechanization: Farmers’ mechanization has been the heated issue recently in Myanmar. MADB and commercial banks have not provided loans sufficient for farmers’ mechanization. Firstly, because MADB has suffered from a lack of capital fund, the Bank has needed to give the priority to emerging financial demands for short-term working capital. As a result, MADB’s term loan amount for farmers’ machinery has decreased drastically in the recent years. Specifically, the loan disbursements decreased from 6,977 million kyat (100%, 4,544 borrowers) in FY2010 to 4,902 million kyat (70%, 3,379 borrowers) in FY2011 and 87 million kyat (1%, 117 borrowers) in FY2012. Moreover, the term loans have not been disbursed since early FY 2013. Secondly, the commercial banks are prohibited to take credit risks of medium-to long-term loans for investment and equipment. Thirdly, farmers find it difficult to make repayments of bank loans every month or quarterly due mainly to the various agricultural business risks. On the other hand, installment sales system has become common among farmers who want to purchase agricultural machinery as the table below shows.

Table 4-3. Financial Options for Farmers’ Mechanization in Myanmar

	Public		Private		
Manufacturer	SOEs	-	Domestic and foreign makers including KUBOTA		
Sales agent	MOAI-AMD	-	Good Brothers Co., Ltd.		
Method	Installment sales	Policy-based term loan	Installment sales by partner bank or non-bank		
Partner bank/non-bank	-	MADB	Innwa Bank	Myanmar Citizens Bank	Oriental Leasing Co., Ltd.
Financing conditions					
Maturity	2 year	3 years (or less)	1 year	1 year	1 year
Interest rates	0.0%	8.5%	8.0%	13.0%	21.6%
Installment schedule	Initial payment: 34% End-1 st yr: 33% End-2 nd yr: 33%	End-1 st yr: 35% End-2 nd yr: 35% End-3 rd yr: 30%	Initial payment: 40% End of first 6-month: 30%	Initial payment: 40% End of first 6-month: 30%	Initial payment: 50% End of first 6-month: 25%

			End-1 st yr: 30%	End-1 st yr: 30%	End-1 st yr: 25%
Guarantor	-	2 persons	Good Brothers Co., Ltd.		
Collateral	-	- Deposit: 50% of total loan amount - Financed property and real estate (land & house)	-	-	-

Note 1: In case of financed machinery produced by SOEs, the ratio of collateral deposit “50%” of total loan amount could be reduced to 30-40% for the MADB term loan.

Note 2: According to the interview with a fruit farmer in Nay Pyi Taw, the manager buys machinery by using installment sales, which is 30% initial payment and 10% of total amount are paid every month for 7-month period. Without installment sales for purchasing farming machinery, single cash payment would be the only payment method in Myanmar.

Source: Sanyu Consultants (Aug 2013), Interview with MOAI, MADB, etc. (August 2013)

Regarding the policy support to farmers, according to the interview with MOAI–AMD (Agriculture Machinery Dept.), the Ministry has 118 “stations” where the Ministry has provided the following services: 1) Contract operation service by using farming machinery (tractor, power tiller, etc.); 2) Selling of machinery by installment sales method (5,000 units/year in FY2012); 3) Training program (1,869 students/year in FY2012); and 4) Maintenance service. The Director General of AMD indicates that the potential demand for machinery is approximately 30,000 unit/year. Meanwhile, MOI has some manufacturing factories (i.e. state-owned economic enterprises), which produce 300 tractors and 1,000 power tillers/farming equipment annually.

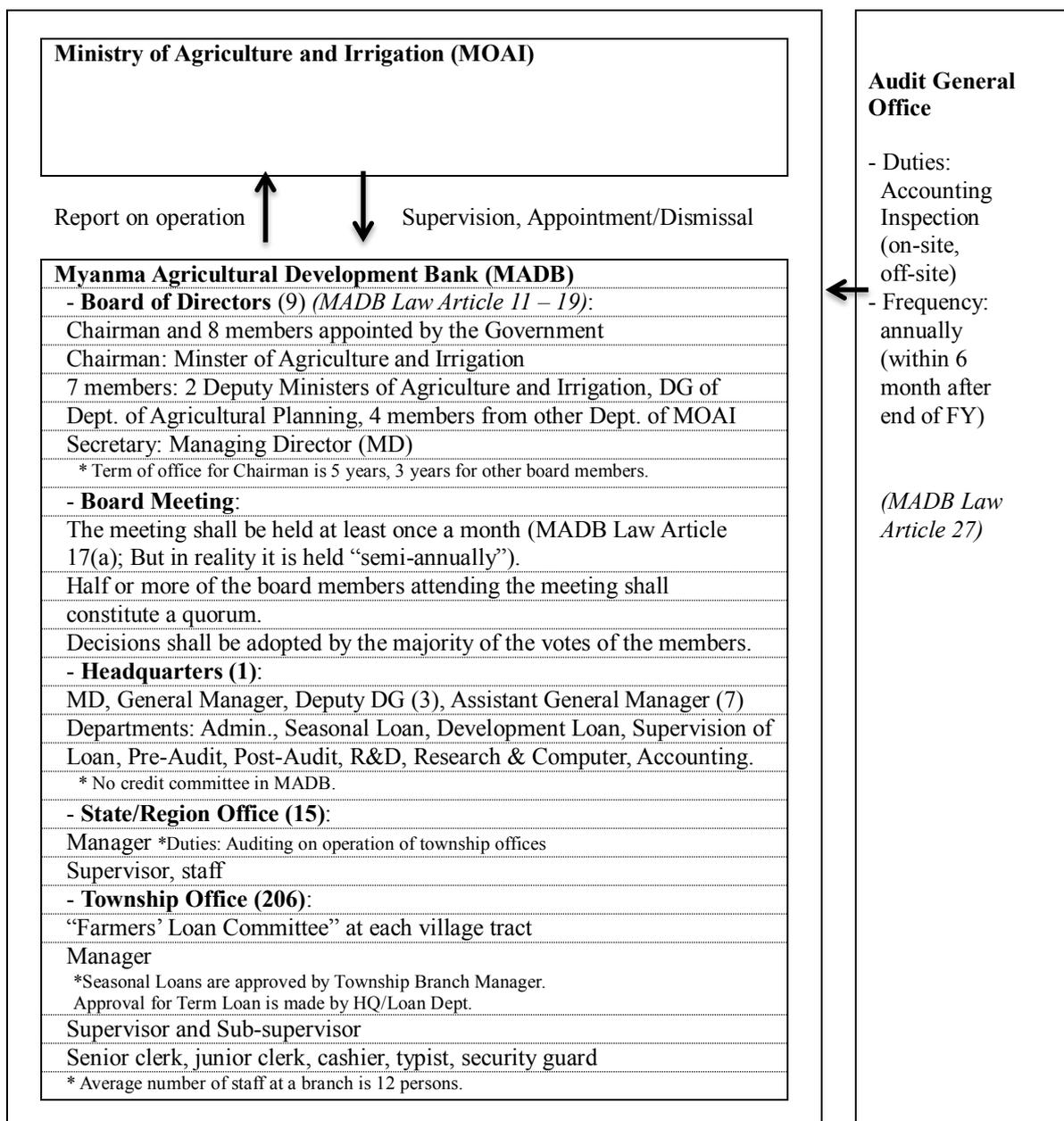
Credit appraisal system at PFI candidate banks: It seems that commercial banks have accumulated credit appraisal methodology and experiences in their business history in Myanmar, but they have lack of experience in medium-to long-term lending practice due to the CBM’s strict regulation on it. As a result, it seems that the commercial banks in Myanmar have not established a credit appraisal system for medium-to long-term lending and its necessary methodology on financial & non-financial analysis, project evaluation, future cash flow analysis, etc.

In MADB as a policy-based specialized agriculture bank, loan approval of “Seasonal Loan” appears to be conducted almost automatically at each branch. However, according to the interview survey with the headquarters and branches of MADB, the Bank has seemed to transfer its credit appraisal function to “Farmers’ Loan Committee” at each village tract. Because the Committee has practical access to the information of farmers and their financial status, the existing lending model functions well while solving the so-called “problem of information asymmetry” in agricultural lending. The Committee consists of 5 members including village tract head, committee head, Myanmar agricultural process/crops in-charge (MOAI), village tract land record clerk and representative of farmers’ group. On the other hand, in the case of much higher risky “Term Loan”, the loan application is fully examined by each branch and state/region branch and the approval is finally made by the Loan Department of the Headquarters.

Generally, policy-based finance has a bureaucratic flavor because it is part of the political process and it may deviate from market principles. But under both the “Farmers’ Loan Committee” system and the inspection of the Audit General Office, the operational independence of MADB from the politicians appears to be guaranteed to some extent. As a result, corruption is also controlled and individual loan decisions are based on the objective credit-worthiness of the farmers that want to take out the MADB loans.

Differences of corporate governance of PFI candidate banks: MADB is not licensed as a bank under the Financial Institutions Law (1990), and the corporate governance is stipulated in the MADB Law (1990) (Chapter IV). Also, the article 29 of the MADB Law mentions that the Myanmar Companies Act shall not apply to the Bank. MEB is licensed as a bank and supervised by MOF/CBM. Because MEB is classified as a state-owned bank, the corporate governance complies with the State-owned Economic Enterprises Law 1989. Therefore, as for MEB, there are no legal provisions regarding corporate governance, organization and management system. On the other hand, SMIDB, GTB and Kanbawza Bank are classified as a private commercial bank under the supervision of MOF/CBM, and their corporate governance comply with the Myanmar Companies Act 1913.

A critical issue of MADB as the main player of agricultural financing in Myanmar: MADB is not licensed as a bank under the Financial Institutions Law (1990), but it is a financial institution established by the MADB Law (1990). As a result, the Bank is not regulated and supervised with the prudential standards applicable to any other commercial banks. The Bank needs to report to MOAI and Audit General Office, which do not have the capacity to conduct risk-based supervision. But, in practice, the Bank reports their performance indicators such as loans outstanding, NPL ratio, etc. weekly to the CBM on a voluntary basis. Regarding corporate governance, MADB operates under the direction of MOAI. According to the Article 12 of the MADB Law, the members of the Board of Directors are from MOAI/relevant ministries and appointed by the Government, but in reality all the members are the minister and senior officials of MOAI. The interview with the Bank suggests that the authority is centralized at MOAI. The administrative control over MADB appears to be tight in the daily banking operation. For instance, in terms of internal risk management system, critical matters such as the interest rates, annual lending volumes, etc. are decided by MOAI and the Myanmar government. As of today, the deposit rates are currently 8%, and lending rates are set at 8.5%. This situation has given the Bank a very slight spread margin. According to the financial statements of MADB, in FY 2012 the net operating income per head is 4.3 million kyat, which is about a third to half of other commercial banks. This may be partly because MADB has not established an IT-based efficient system for managing the huge number of small amount loan applications. As a result, there may be remaining concerns about the capacity of MADB to manage the risks of banking operation sophisticatedly and efficiently.

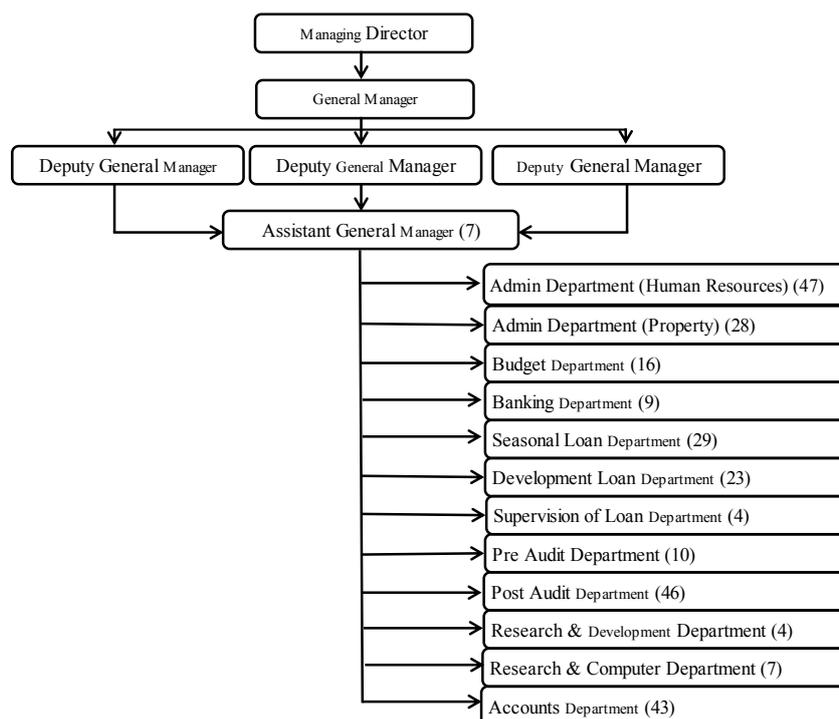


Note 1: At the end of each fiscal year an amount equal to 25% of the net profits shall be allocated in multiples of MMK 1 million to the Reserve Fund until it amounts to 100% of the paid-up capital of the Bank. (*MADB Law Article 9 (b)*)

Note 2: The Chairman shall be deemed to be a public servant under the Section 21 of the Penal Code. (*MADB Law Article 15*) The bank officers and staff shall be public servants. (*MADB Law Article 18*)

Note 3: The total number of MADB staff (2,645) includes 262 “officers” who passed the senior public servant examination.
Source: MADB Law (1990), interview with MADB (August 2013)

Figure 4-2. Internal Management System in MADB



Note 1: MADB Head Office staff numbers are given in parentheses.

Note 2: Development Loan Department is the same department as Term Loan Department.

Source: Presentation Material prepared by MADB (August 2013)

Figure 4-3. Organization Chart of MADB Head Office

Business results of MADB in the recent 3 years: From the viewpoint of policy-based financing, the lending interest rates have been revised gradually from 21% in FY 1998 to 8.5% in FY 2012. Given such a situation, the interest income has seemed to stagnate in the past 2 years (Interest Income: 22,960 million kyat in FY 2010, 33,626 million kyat in FY 2011, and 29,026 million kyat in FY 2012). But the outstanding loans increased from 84, 222 million kyat in FY 2011 to 193,243 kyat in FY 2012. As a result, MADB has achieved the net profits of about 8.5 – 9.3 billion kyat in the past 2 years. The Bank’s recent balance sheet implies that it has been difficult for MADB to meet a growing demand owing to the drastic decrease of deposits from customers (The deposit decreased from 87,616 million kyat in FY 2011 to 14,556 million kyat in FY 2012). This drastic decrease of deposits was triggered from the policy change in FY 2012 that the current government abolished the deposit enforcement system (4-5% of total loan amount + amount of interest rates to be paid under the loan contract) for farmers’ loans from MADB.

MADB’s borrowings from MEB and general situations on deposit & lending rates: Due to the recent abnormal increase of MADB’s loan to deposit ratio, MADB has obtained 1-year-borrowings at 4% from MEB (The borrowings are 13,716 million kyat in FY 2011 and 176,146 million kyat in FY 2012). This has given a good impact on MADB’s current financial status, while MEB has made deficits to be compensated finally by the government budget. Meanwhile, under the general

instruction of the Central Bank of Myanmar, while the loan rates are obliged to be 13% or less, the deposit rates must be between 8% and 10% in Myanmar. This situation implies that MADB has been able to rely on the government support through MEB.

Practices of GTB's credit appraisal and loan decision-making: In accordance with the current instruction of CBM, the only decision-maker on each loan application is the Board of Directors (BOD) meeting. In practice, all loan applications are decided by the monthly BOD's meeting in GTB. The function of the credit committee is to make recommendations on each loan application by providing all relevant documents on each loan application for the decision-making in the BOD's meeting. The staff of loan department of both headquarters and regional branches is required to pay much attention to the following two points: 1) verifying the business outline mentioned in the business license such as location, total site area, number of farm-raised fish, etc.; and 2) certificate of collateral land and house. At the same time, the bank officer in charge of appraisal requests a "recommendation letter" about the applicant farmers/businesses to the Livestock and Fisheries Department of Ministry of Livestock and Fisheries. The recommendation letter proves the following three things: 1) the fact that the applicant is doing livestock and/or fisheries business; 2) total site area; and 3) valuation amount of site land including pond. It takes about a week to get the recommendation letter for GTB in Yangon, while it takes about a month in rural areas such as the Shan State. In practice, about 10% of all application for a recommendation letter have been rejected mainly because of the loan applicant's false report. There are some cases that GTB disburses the applied loan with the recommendation letter and without any real estate mortgages.

2. Issues Related to the Banking Regulatory Framework

Needless to say, "agricultural financing" is one kind of financial transaction and it is significantly influenced by the supervision and regulations directed at banks/financial institutions that act as the lenders for this financing. Thanks to the efforts of banking reform and modernization, Myanmar has just started stabilizing and strengthening its banking sector and it might be assumed that the new financial policies will affect agricultural financing and its practice in Myanmar.

According to the interview survey with the CBM and the banks, there are currently some remaining issues and impediments against the agricultural banking operation and practices.

New Financial Institutions Law: The Financial Institutions Law (1990) is on the process of revision. It is expected that the Board of Directors of the CBM will discuss the revised law and it will be submitted to the Parliament soon. This would be expected to improve the financial soundness and stability of banking sector in Myanmar. However, at the same time, considering about the expected risk-based strict banking supervision, there might be concerns about banks' negative attitude on

agricultural financing in Myanmar. It is important to wait and see how the situation moves by adopting the new Financial Institutions Law and reconsider about necessary policy-based agricultural financing in Myanmar.

Banking supervisory framework: It is likely that the banking prudential regulations will be revised by adopting the new Financial Institutions Law. But currently the Banking Supervision Department of the CBM undertakes off-site monitoring and on-site examination of banks. In practice, the CBM takes actions on the banks' operation by applying the following prudential regulations:

- 1) 10% of total deposits are required to be maintained by each bank at the minimum reserve requirement. 75% of the required reserve is to be deposited with CBM and 25% of the reserve may be maintained in the form of cash.
- 2) The required reserve for a bank to be maintained with CBM must not exceed 35% of the total liabilities of the bank. However, in the event of serious inflationary pressure, CBM may increase the 35% ceiling requirement.
- 3) Banks are required to maintain the level of their liquid assets against their eligible liabilities at not less than 20%.
- 4) The risk-weighted assets of a bank shall not exceed ten times of the combined total of its capital and reserves.
- 5) The banks must inform CBM about their reserve position and liquidity ratio on a weekly basis and report on their capital adequacy ratio on a monthly basis.
- 6) The banks shall take appropriate measures to cover the loans as much as possible and CBM shall also give them instructions and guidance in order to take necessary steps.
- 7) All banks are required to build up and maintain a general provision account amounting to at least 2% of total outstanding loans and advances at the end of the year. They are also required to maintain specific provision for doubtful and/or bad loans on a case-by-case basis.
- 8) Also, according to the Financial Institutions Law, a bank cannot lend more than 20% of its capital plus reserves to a single individual, an enterprise, or an economic group.

The interview with the CBM suggests that the CBM has just started adopting a methodology similar to CAMELS that checks with 6 aspects of financial institutions. The present supervisory method for the CBM's monitoring is described in the table below. However, it seems that the internationally adopted CAMELS methodology would take more time to become established practically in Myanmar.

Table 4-4. Banking Supervisory Method Adopted by CBM

Capital Adequacy	
	Total capital/Risk-weighted Assets
	Off-balance sheet item/Total capital
	Insider loans/Core capital
	Large exposures/Total capital
	NPL-provision/Core capital
Assets Quality	
	NPLs/Gross loans
	Provisions/NPLs
	Earning assets/Total assets
	Fixed assets/Core capital
	Large exposures/Gross loans
Management Soundness	
	Overall management
Earnings	
	ROA
	ROE
	Net interest margin
	Cost deposits
	Costs to incomes
	Overhead to incomes
Liquidity	
	Short-term gap
	Liquid assets/Total Deposits
	Interbank borrowings/Total Deposits
	Bank funded advances/Total deposits
	Large exposures/Total capital
	NPL-provisions/Core capital
Sensitivity to Risk	
	Exposures/Core capital
	Loans/Deposits * <i>Up to 80% (CBM Instruction No.24 dated 27 December 2011)</i>
	Assets/Liabilities

Source: Documents prepared by CBM (September 2013)

Regulation on deposit limit: The banking regulation has been strengthened since 2003 in Myanmar. In particular, deposit amount was limited to 10 times of authorized capital of each bank, which had made it difficult for the banks to expand their business in Myanmar. The regulation has been abolished since 2012. The banks have just come to the stage to work more aggressively for the potential companies/individuals in Myanmar.

A regulation on impediment against banks' medium-to long-term lending: According to the CBM's Instruction No. 22 dated 8 September 2011, it is interpreted that the banks are prohibited to provide more than one-year loans in Myanmar. As a result, the banks in Myanmar have not experienced of medium-to long-term lending and its necessary credit appraisal.

Adoption of general collateral-related regulations in the case of loans to banks: The commercial banks need to require fully covering collateral for lending to banks as well as general enterprises. In reality, MEB has required fully covering collateral to the short-term loans to SMIDB. This has seemed to be a constraint condition for SMIDB’s loan expansion.

Debt classification: According to CBM, in commercial banks the debts are classified as the table below describes. However, there is a possibility that the debt classification rule will be revised in accordance with the international practices. This would create an unstable business environment for banking sector and need continued and careful observation.

Table 4-5. Debt Classification in Myanmar Banking Sector

Debt Classification	Definition	Provision
Bad loans	Principal or interest payments Overdue: 24 months <	100%
Doubtful loans	Principal or interest payments Overdue: 12 months - 24 months	50%
Sub-standard loans	Principal or interest payments Overdue: 6 months – 12 months	2%
Normal loans	-	0%

Source: Document prepared by CBM (September 2013)

Strict regulation on interest rates: According to the CBM Instruction No.11 dated 27 December 2011, the lowest deposit rates are currently regulated to be 8% (CBM rates 10% - 2%). At the same time, the highest banks’ lending rates are 13% (CBM rate 10% + 3%). As a result, the banks are forced to do business within the maximum 5% spread margin, which appears to discourage open competition among commercial banks in Myanmar.

Revised Law on Agricultural Land 2012: The former Agricultural Land Law stipulated that commercial banks except MADB were not able to have agricultural land as collateral. The regulation was revised, and now commercial banks can have agricultural land as collateral legally. However, in practice, the commercial banks appear to hesitate to extend loans to farmers/agribusinesses by having agricultural land as collateral.

3. Assistance Programs Conducted By International Donors

Considering about the general situation of assistance programs for agricultural financing in Myanmar, it appears that the international donors have paid attention only to short-term working capital for small farmers in collaboration with some NGOs in rural areas. But at the same time, there seems to be a significant financial gap in the field of medium-to long-term financing for farmers’ mechanization.

MADB diagnostic by the World Bank: In April 2013, the World Bank and Livelihoods and Food Security Trust Fund (LIFT) have agreed to conduct a diagnostic on MADB and formulate

recommendations to strengthen it. The research team visited MADB headquarters and branches to talk to senior management and staff and collect data on various aspects of MADB operations. The final draft report including findings and recommendations was submitted to MADB and stakeholders, and workshop was facilitated by the World Bank and MADB in September 2013. The SWAT analysis of the World Bank's research team suggests that MADB has the following weak points: 1) Loan portfolio is highly concentrated in smallholder farmers and rice production; 2) Dependence on subsidized funding from government through MEB; 3) Weak risk management and corporate governance; 4) Rudimentary IT and operations infrastructure; and 5) MADB is not a full-fledged bank, but a department of the MOAI.

Capital assistance by UNDP: UNDP has put money into 5 funds: 1) PACT; 2) Save the Children; 3) GRET; 4) Grameen; and 5) Odah (India). It plans to expand its investment into PACT. It seems that those UNDP activities have been successfully conducted thanks to the long-term human resource development programs since 1994.

Microfinance assistance by USAID: USAID has become involved with the development of microfinance in Myanmar since 2009. The PACT is the main platform, where they do the activities in Shan state, Ayeyarwady delta area and dry region. In addition, USAID is one of the donors of LIFT and considering about the assistance in the field of mobile banking, improvement of market access, proper pricing, etc.

ADB's Country Operation Business Plan (COBP) 2013-2016: ADB plans to disclose the COBP 2013-2016 in October 2013. The Plan is supposed to mention that ADB will conduct the Regional Development Project (i.e. sector loan to agriculture sector) including development of irrigation, roads, water supply and electric power. In addition, ADB will conduct the assistance projects for improving agricultural infrastructure where the counterparts would be MOAI-Dept. of Agricultural Development and regional government offices of state, township and village tract. ADB is currently making surveys on feasibility of irrigation projects in the central dry region (2015-).

Planned TA project for SMIDB: SMIDB will agree on a MOU with GIZ, and in March 2014, SMIDB and GIZ are supposed to start the TA project in the field of credit appraisal and project evaluation method including environmental impact evaluation.

4. Microfinance in Myanmar

4-1. Current Situation of Microfinance

General Current Situation conducted by Myanmar Government: In Myanmar, microfinance (MF) business law was enacted on November 30, 2011. The objective is to reduce poverty of grassroots people and to promote their socio-economic life. Under the MF business law, there are 166 microfinance institutions (MFIs); i.e. 6 INGOs, 13 MNGOs, 75 co-operative societies, 67 Myanmar companies, 5 foreign companies. These MFIs are permitted by Microfinance Business Supervisory Committee (MBSC) which committee's Chairman is Minister of Finance, Union of Myanmar Government. Before apply MF business license, they have to be legal entities established under the Myanmar Companies Act or Co-operative Societies Law or the Law Relating to Forming of Organizations or any existing Laws. Local and foreign organizations, partnership firms, companies, co-operative societies, bank and other non-bank financial institutions can apply for a microfinance license. But currently, the domestic private banks are not allowed yet to carry out microfinance activities not by the banking law but only by the notification. This could be changed at any time, so we should pay attention. Up to now, if the domestic private banks want to extend their activities to MF, they need to establish and apply for the license as a new company or organization of microfinance. On the other hand, the organizations from foreign countries are allowed to establish MF institutions in Myanmar to engage the microfinance activities.

MFIs can operate the following activities.

- 1) extending micro-credits,
- 2) accepting deposits,
- 3) remittance of money,
- 4) carrying out the insurance business,
- 5) carrying out other financial business,
- 6) borrowing money from local and abroad.

Recently, only extending micro-credit and accepting deposits are permitted. In near future, other microfinance activities will be permitted depending on the development of experience and compliance of the MF Business Laws.

Conditions of MFIs: MFIs need to put the paid-up capital in the government appointed bank; 15 million kyat for non-deposit taking institutions and 30 million kyat for deposit taking institutions. The

Integrated Community Development Project (ICDP) in 49 townships of Myanmar. In the above section, it already mentioned that UNDP has put money into 5 funds: 1) PACT; 2) Save the Children; 3) GRET; 4) Grameen; and 5) Odah (India). Among that, PACT is one of the active microfinance institution and it can be said that Myanmar microfinance history started by PACT in 1997 conducted by UNDP Myanmar Office.

PGMF is a part of PACT: PACT Global Microfinance Fund (PGMF) is a wholly owned subsidiary of PACT Inc. dedicated exclusively to microfinance. PGMF is home to Pact's institutional knowledge, tools, technology, innovation, partnership, products, and services in microfinance as well as its growing microfinance portfolio. In 2004, PACT kicks off the Promoting Sustainable Access to Health: An Educational and Economic Approach (SAHEEA project) with funding from the Stromme Foundation and the Department of State. The project set the foundation for PGMF's creation. UNDP's microfinance activities are implemented by Grameen Bank and GRET in 2006. PGMF registers as a microfinance institution under Myanmar's 2011 Microfinance Business Law.

3 Main Programs:

- (a) PACT MF program started in 1997 as an UNDP project,
- (b) PACT Global Microfinance Fund (PGMF) MF program started in 2005 with MNGOs,
- (c) Myanmar Access to Rural Credit (MARC) program as a partnership with UNOPS/LIFT.

Coverage area of PACT & PGMF: PACT reached to 603,193 households covering 6,142 villages from 25 townships; i.e. Sagaing, Myaung, Chaung Oo, A Yar Daw in Sagaing Division, Taung Thar in Mandalay Division, Magway, Taung Dwin Gyi, Yee Nan Gyaung, Pakkoku, Nyaung Oo, Kyauk Pa Daung in Magway Division, Kalaw, Pindaya, Nyaung Shwe, Ywa Ngan, Kyauk Me in Shan State, Bogalay, Mawlamyaing Chyun, Lapputta, Nyaung Don, Pan Ta Naw, Da Nu Phyu, Zalun in Ayeyarwady Division. For PGMF activities, it is taking action mainly in dry zone, Shan State and Ayeyarwady Division, all the townships are 26. PACT and PGMF are doing microfinance services in 51 townships of the whole country in Myanmar.

Methodology:

- Forming small group of 5 self-selected members, 10 such groups become a center.
- All of group members have responsibility to repay the loan. If somebody did not pay back the loan, all the group members could not borrow anymore. This is a solidarity lending model.
- Loans are without collateral.

- Focuses on women and the poor.
- Integrates credit with saving services.
- Offers multiple types of loans for income generation.
- Introduce micro-insurance program to have safety nets when encounter hardships.
- All transactions take place in villages, creating like a bank in village.
- Aiming self-sustaining institution (MFI) and create capacity building.

When start a new MF program at a village:

- 1) Explanation meeting will be held in the village with village management committee and villagers who are interested in the MF program. They called the meeting a “Income and Social Development Workshop”.
- 2) Make a database of all the households’ data. They so called the data an that “Income Generation Presentation”.
- 3) Discuss the location of new village among current MF villages, taking a cluster approach. This is mainly for the safety network of loan collection return route.
- 4) Find out wealth ranking of all the villagers. The ranking method is very special, and instead of depending on the income amount, it depends on the evaluation of the villagers. First, make three groups. Second, decide the definition of wealth ranking A, B, C, D. Third, vote for each other to decide who is A, who is B, etc. in the group. Finally, data collection will be handled by the Loan Office of PACT. The most wealthy persons are in group A and the poorest persons are in group D. According to this wealth ranking, the MF target group will be selected from group B and C.
- 5) Survey the time lines of women in the village and select a convenient meeting time (1 meeting/2 weeks) because the PACT target group is women.
- 6) To operate the effective agricultural loan, make an agricultural calendar at first. Especially to know when the agricultural operation fees will be most needed.
- 7) Others: making village map, etc.

To start using microlending:

- 1) Need to find 4 friends to be a group. Need election of group leader and secretary.
- 2) Need to attend the training course for 5 weeks; i.e. 2 hours a week. The training has 1-5 level of

modules for non-formal business education.

- 3) Need to have credit proposal. Volunteer of loan officer will help to think about credit proposal together with the borrower.

To continue using microlending:

- 1) Need to attend the meeting held once every 2 weeks.
- 2) The borrowers have responsibility to repay the loan if they want to borrow every year.

Microlending loan scale and products: At the end of July 2013, PGMF had 486,244 active borrowers with 80 billion kyat (83 million US\$) worth of microloans outstanding with a 99.79% repayment rate. The interest rate of credit services is different depending on the loan program; generally an economic loan is 2.5% per month and social loan is 2.0% per month. There are 10 products:

- 1) Regular Income Generating Loans US\$125 – 350 New borrower can start from US\$125 (for livestock, trading, productions, etc.)
- 2) Micro-enterprise Loans up to US\$1,250 Based on the capacity
- 3) Health Care Loans US\$65 For anybody from family
- 4) Education Loans US\$65 School enrollment fees
- 5) Agricultural Loans US\$125 Per acre and for 4 acres
- 6) Consumer Loans up to US\$125 For better living condition
- 7) Extra Loan US\$65 Additional capital for business
- 8) Wholesale Loan for SRGs US\$ 1,875 SRG capital base
- 9) Vulnerable Loan US\$65 Flexible loan to vulnerable members
- 10) Beneficiary Welfare Fund US\$65 Cash assistance due to natural disaster (Micro-Insurance)

A) Regular Income Generating Loans (Regular Loans)

The person who wants to use PGMF loan, should register at PACT branch office and start from the Regular Income Generating Loans, so called “Regular Loans”. The regular loan size is 100,000 kyat (US\$100) for the 1st year client. But at the new village of PGMF program, the loan size starts from 80,000 kyat (US\$80) because there is no confidence between PACT (lender) and villager (borrower). When the 2nd year, the loan size will be a little bigger at 100,000 kyat (US\$100) and another step, the loan size will be 120,000 kyat (US\$120) in the 3rd year. The maximum monthly interest rate is 2.5% (annual interest rate is 30%) for microfinance lending and 1.25% (annual interest rate is 15%) for saving.

The regular loan can be used in various ways but just needs to clarify the loan use plan in the credit proposal, and needs to be use according to the credit proposal. For example, some borrowers use the loan for the operating fees of a street stall, some borrowers bought baby pigs as an investment, some

borrowers bought the materials to make a fishing net, some borrowers start new work as a tricycle driver using the regular loan for a tricycle deposit.

Basic repayment system: The loan collection is once every 2 weeks at the village by PACT loan officer. One loan cycle is one year and there are 25 collection times. To keep everything clear, the repayment amount at each collection time is written in the MF loan recording book. Basically, the loan amount and interest amount for the period of borrowing will be divided by 25, plus the micro-saving amount. For the case of regular loan size 80,000 kyat with 1.25% of interest per month rate, the repayment amount for a time is 3,200 kyat (for repayment of principal) + 480 kyat (for interest) + 480 kyat (for saving). Finally, the total collection amount for one borrower is 4,160 kyat/time (per 2 weeks).

B) Micro-enterprise Loans (ME Loans)

The borrower who has a 3 years record can start to use Micro-enterprise Loans; so called ME Loans. The borrower selection process of ME Loan is in the hand of the MF 5 persons group. They know each other's economic conditions and life cycles very well and the group members can decide who has no problems paying off all his debts. After getting the agreement of group members, the borrower needs to get the recommendation from center level (5persons = 1 group, 10 groups = 1 center) and from the village management committee. With all the persons' agreement, the loan officer sends the ME loan application form to the Project Coordinator via the Project Manager of PACT Headquarters. The ME loan cycle is the same with regular loans. For example, ME loans are used for coconuts trade and for fishing with big nets in the delta area, the pot making and the paper making in dry zone, etc.

C) Agricultural Loans

The main focus point of an agricultural loan differs according to the crops being cultivated, and the area where the agricultural loan is implemented, because in Myanmar, different cultivating situations depend on the kinds of crops and location where cultivation takes place. Therefore, the agricultural loan period is different according the cultivated crops, and the time of the start of the loan is different as shown in the record of the agriculture calendar at the MF implementing place.

Another different point of agricultural loan with regular loan is that there is no need to pay back the debt principal until the last repayment time. At every meeting of 2 weeks, the borrower needs to pay back just the interest.

To get the agricultural loans from PGMF, the borrower has to bring copies of two documents; registered permit of cultivating farm and loan record book from MADB.

D) Wholesale Loan for SRGs

In Myanmar, the head of household is usually the husband. Most of house-wives are working the same agricultural activities as the householders or have no work. There is one activity of Integrated Community Development Project (ICDP) for Self-Reliance Group (SRG). SRG is a group of several persons, mostly house-wives. This program supports the members of SRG to save money and to borrow loans. The objective of this project gives an opportunity to access loans for the house-wives and to raise the status of women.

Incentive facts of microfinance:

- ✧ From the aspect of borrower, the first incentive is very low interest rate compared with informal private lenders. For the further information, the informal private lenders' monthly interest rate is 4-5% with gold collateral and 10-20% without collateral.
- ✧ The second incentive is easy processing and the ability to borrow money in an emergency even though the interest rate is higher than MADB loan.
- ✧ The third incentive for the small land size farmers, is that they can borrow the operating farm fees at an appropriate time for the cultivation season. After the small land size farmers got to borrow the seasonal loan from MADB, they usually pay back their agricultural loans to the MFIs.

Microsavings: PGMF clients participate in a compulsory savings program to promote the savings habit and create a financial safety cushion. On average, clients deposit between US\$0.40 and US\$1.00 per month into their saving account. As of July 2013, PGMF had 15.6 billion kyat (16 million US\$) in savings from 545,288 clients. The interest rate paid for members' saving is 15% per annum.

Non-financial services: Microfinance service is a financial service but at the same time, non-financial services are very important for the poor to achieve self-sufficiency.

- ✧ Capacity Building: Training for beneficiaries
- ✧ Institutional Building: Formation of credit and saving group, Formation of microfinance centers
- ✧ Beneficiary Welfare Program (Micro Insurance Program): Cover risks, Benefits, Additional benefits

Future Plan: There are plans to expand the coverage area of micro-credit activities and also to increase the number of households of borrowers. In near future, PACT and PGMF's activities will be unified, according to PACT. Moreover, at the interview with UNDP and PACT, it was stated that there

is no plan to set up a new loan program of agricultural machinery.

(2) Case 2: LIFT

Background of LIFT: The Livelihoods and Food Security Trust Fund (LIFT) is a multi-donor fund established in Myanmar. The donors to LIFT are Australia, Denmark, EU, Netherlands, New Zealand, Sweden, Switzerland, and the United Kingdom. The donors contracted the United Nations Office for Project Services (UNOPS) as the fund manager to administer the funds and provide monitoring and oversight for LIFT.

Coverage area of LIFT: After the 2008 Nargis Cyclone, UNOPS and Ministry of National Planning and Economic Development (MNPED) signed a Memorandum of Understanding (MOU) and LIFT started to conduct microfinance initiatives in 2009. At the beginning time of 2010, the main projects are situated in delta area, so called “Delta 1”. These projects are for only 1 year and already closed. Now there are lots of projects going on: 16 projects in country-wide, 11 projects in Delta 2 (take 3 years), Learning and Innovation, Financial Inclusion, 1 project in Rakhine. Two new programs are designed for the Dry Zone and for “Peace areas”. For “Delta 2” project, it has a coverage area of three townships (Lapputta, Bogalay, Mawlamyaing Chung) until 2015.

Operating MF services: UNOPS/LIFT has 30 staff with 160 million US\$ in Yangon office. Among 30 staff, there are 5 national staff, and 1 national staff member is needed to monitor around 12 projects. For example, one of the national staff of LIFT is working and going in the field to supervise three projects with PACT which is implementation microfinance institution.

LIFT's Vision: To be an effective mechanism for channeling aid to implementing partners to achieve its goal of improving the food and livelihood security of the poor and vulnerable in Myanmar.

Objective of LIFT: To make progress towards the achievement of Millennium Development Goal 1 in Myanmar, i.e., reducing by half the proportion of people living on less than a dollar a day, achieving full and productive employment and decent work for all, including women and young people and reducing by half the proportion of people who suffer from hunger.

LIFT's purpose: To increase food availability and incomes for two million target beneficiaries. LIFT is expected to continue operations until at least the end of 2016.

(3) Case 3: Save the Children

The activities of Save the Children start since 2002. At the beginning, the main activity is health care activity such as HIV, water & sanitation, malaria etc. About agricultural activity is implementing for the agricultural infrastructure development such as providing paddy seed, promoting of home garden

at Rakhine State (4 townships).

The coverage area: Save the Children’s activities are conducting in 5 Division and State (9 townships); i.e. Bago Division (Thee Gone), Mon State (Mawlamyaing, Mudon, Kyaukmayo), Karin State (Pha-an), Magway Division (Kan-ma), Ayeyarwady Division (Nga pu daw). Among these Division and State, agricultural loan is implementing in three townships; Theegone, Man-ma, Pha-an. The loan period is 4 months and repayment is once every 2 weeks. There is a very similar repayment system to the agricultural PGMF loan; once every two weeks, the borrower needs to pay just the interest and the debt principal payment should be repaid at the last time of repayment (it means 4 months after the loan started).

(4) Case 4: World Vision

The activities of World Vision started since 1998 and World Vision’s MF activities became enlarge after getting the MF license in August 2012.

Table 4-6. Loan Portfolio and Clients of World Vision

	2012 August	2013 August	Increase
Loan Portfolio (US\$)	1,944,714	3,600,154	105%
Clients	11,464	27,193	145%

Source: JICA Study Team

- ✓ On time repayment: 100%
- ✓ Average Loan size outstanding: US\$144
- ✓ Average Loan size disbursed: US\$176

Table 4-7. Loan Products of World Vision

Products	Loan Term	Loan Size	Payment type
Commerce Loans	6-12 month	50 – 2,000 US\$	Flexible
Agriculture Loans	9 month	50 – 1,200 US\$	Monthly Interest

Source: JICA Study Team

- ✓ Other Loan Products: Education Loan

Table 4-8. Allocation by Loan Portfolio

Trade	46%
Services	28%
Production	8%
Agriculture	7%
Animal Husbandry	6%
Education	5%

Source: JICA Study Team

Point of World Vision Activities:

- 1) There are no Regular Loans such as PACT. Therefore, everybody can start from any loan program if the person fit with the terms and conditions of loan users. The specifics of these terms and conditions need to be confirmed in the next survey. This point can be of reference to the TSL end-user's terms and conditions.
- 2) In the future, World Vision has some plan to use the loan program of its international fund when Myanmar Government permits the operation of MFIs' activities such as borrowing money locally and from abroad.
- 3) Up to now, World Vision's loan size for each client is the largest among the MFIs. Therefore, MF activity of World Vision has more potential than other MFIs.

4-3. Issues and role of Microfinance in Myanmar

- (A) ***Agricultural Microlending amount is limited with farm size:*** MADB has seasonal loan which is lending 100,000K/acre limited to the maximum 10 acres' farmers. For that, the farmers who have over 10 acres, they can lend only 1 million kyat. The lending credit from MADB is limited. Moreover, PACT and LIFT has also limited farm size less than MADB. LIFT is lending agricultural loan to the maximum 3 acres' farmers and 4 acres' farmers by PACT. For these reasons, it can be seen that most of small size farmers is depending on the informal money lender with high interest rate, 5-20% per month.
- (B) ***The lending time to farmers:*** MADB's seasonal loan is very similar with MFIs' agricultural microlending. The big different point is the lending time to farmers. MADB's seasonal loan is mostly late for cultivation time. Usually, the farmers need farm operation fees in May before starting to cultivate. But the national budget needs to pass the parliament before MADB can start to lend seasonal loans, so lending occurs after the farm operation fees are needed. PACT and LIFT have the main role of making the money available in the rural area at the time when the farmers need farm operation fees. This is the difference between MFIs' microfinance service and MADB's seasonal loan service.
- (C) ***Repayment time from farmers:*** Currently, the repayment time of agricultural loan is harvest time for both MADB and MFIs. At the harvest time, the rice price is at its lowest. From the farmer's side, he or she wants to hold the rice and continue to borrow microfinance money until the rice price is stable.
- (D) ***Necessity of new loans in Agriculture and Agri-business:*** There are a lot of needs to extend microfinance loan in the agriculture sector not only in terms of the number of borrowers and loan

size, but also for new programs of loans such as agricultural insurance loan program, value chain financing program for producers (millers) & traders, program on sale of fertilizer to farmers with credit, etc. LIFT is thinking to make such strategic programs in collaboration with private partners.

(E) **Reliability of MNGO**: Some MNGOs are group or community based organization types and are structured systematically, but some are personal based types without organized association. Of the two types of MNGOs, the second one is risky for farmers' savings. To protect the savings of the poor, the Myanmar Microfinance Supervisory Enterprise (MMSE) is taking the lead to establish the Myanmar Microfinance Association (MMFA). MNGOs, INGOs will be under MMFA.

CHAPTER 5 Review of the TSL Project for Agriculture and Rural Development

1.Objectives

Farmers/agribusinesses have difficulty in accessing to medium- to long-term (MLT) bank loans due mainly to the capital shortage of MADB and other banks focusing on agricultural financing in Myanmar²⁹. Given such a current situation, the TSL project aims to enhance the MLT agricultural financing mechanism in the Myanmar banking sector and ease the access of farmers/agribusinesses to MLT loans by the following: 1) Establishing an on-lending facility through a bank; 2) Assisting the Project Implementation Unit (PIU) in implementing the project; and 3) Supporting the PFI's capacity building in terms of customer information management, lending procedures, credit appraisal, marketing of the TSL, end-users' (sub-borrowers') business support, etc. In doing so, the TSL project would contribute to the economic development, enhancement of agriculture/agribusinesses and improvement of farmers' living in Myanmar.

It should be realized that the argument for the project scheme in this chapter is a mere proposal of the project. The ultimate implementation structure of the project will be determined through bilateral discussion.

2. Beneficiary

From the observation in the Chapter 2, Chapter3 and Chapter4, the main agricultural financial needs appear to come from the current situation that smaller farmers have difficulty in getting short-term loans for working capital sufficiently and timely. However, MADB as the only policy-based agriculture bank has achieved an increase of short-term loans outstanding in recent years, although the remaining problem is still the low quality of financial service including the time-consuming loan processing turnaround time, inconvenient access to a MADB branch for farmers, insufficient amount of individual short-term loans ("seasonal loans"), limited eligibility, etc. In terms of short-term loans for farmer's working capital, it is strongly required that MADB will continue to make efforts and improve the service quality while making the most use of profits to be generated by the operation of the TSL project.

Meanwhile, potentially there seem to be huge financial needs of MLT loans for farming mechanization. The farming mechanization is critically important for the further development of agriculture sector³⁰, but MADB has not been able to get MLT finance to provide MLT loans to farmers/agribusinesses in Myanmar. This kind of critical financial needs would have to be given the

²⁹ As the Study Team pointed out in Chapter 4, MADB has some difficulties. See P. 70-80

³⁰ See P. 13-15. (Agricultural Modernization)

priority in the policy-based MLT finance scheme; i.e. TSL project. In essence, “TSL” as a policy-based loan scheme should be limited to the real financial needs where policy intervention is significantly needed. Therefore, it is recommended that the main target of TSL for agriculture and rural development shall be focused on the farmers/agribusinesses that need MLT loans to achieve the farming mechanization and its related MLT working capital³¹.

3. Expected Effect

The TSL project is expected to benefit farmers/agribusinesses, PFI, executing agency and MOF as follows:

- Farmers/agribusinesses: Increased access to medium- to long-term financing will contribute to agriculture and agribusiness development by increasing farmers’ productivity and competitiveness, as well as benefiting the surrounding regional economy.
- PFI: Improved agricultural lending system for the PFI will result in reducing costs, reducing risks of agricultural lending, and expanding agricultural lending in a sound manner.
- Executing agency: Improved management system will contribute to the improvement of policy-based agricultural lending in Myanmar.
- MOF: Improved monitoring system will contribute to the improvement of policy-making process regarding agricultural financing in Myanmar.

³¹ The TSL program shall support farm mechanization and agribusiness promotion. As one of the major constraints to be tackled for agricultural development in Myanmar, it is required to support farming mechanization. On the other hand, agribusiness companies are nodes of agricultural products and market information. Therefore, the TSL program can provide to the agribusiness companies in the future. Regarding to the challenges for MADB, see Chapter 6 (p.103)

CHAPTER 6 Policy Recommendations

1. HRD for Improving Finance for Agriculture and Rural Development

1-1. Overview

In order to more effectively achieve the objectives of the TSL Project for agriculture and rural development to support the modernization of agriculture in Myanmar from the financial standpoint, in addition to providing the consulting services for the Project Implementation Unit (PIU) and PFIs indicated in Chapter 5³², human resource development for end-users/sub-borrowers and for extension staff is also essential. During the course of the survey, Myanmar government entities and farmers frequently pointed out that in addition to providing farmers with financing for mechanization, there was also a need for training in farm management and in proper farming techniques using the machinery. For this reason we propose that JICA establishes a separate technical assistance project related to the TSL Project.

1-2. Outline of Proposed TA Project for End-users/Sub-borrowers

We propose implementing a “The Project to related to the Improvement of Agricultural Productivity in the Designated Areas Supported by the Proposed TSL for Agriculture and Rural Development in Myanmar” as a three-year technical assistance project related to the TSL project, beginning in April 2014. This project should be implemented in the three targeted areas of the project: Shan State, the Central Dry Zone, and the Ayeyarwady Delta region. Improvement of agricultural productivity in these three areas will be achieved by introducing the agricultural machinery to be promoted under the TSL project, and by facilitating the proper use of that machinery to ensure reduced risk, income growth, and rising standards of living. Also, in parallel with agricultural modernization by means of introducing agricultural machinery, the economic effect expected in Myanmar’s rural communities as a result of the TSL project can be made that much larger by making progress with farming technology/management and post-harvest technology appropriate for modernization.

Furthermore, improvement of customs and practices relating to financial management at the individual farmer level is also necessary from the perspective of ensuring more reliable loan repayments by the farmer taking out the loan. This sort of farming technology/management instruction also contributes to the stability of the TSL’s revolving fund, and increases the likelihood of progressing to the next phase of the TSL project. It is performed by establishing practical on-the-job training at farms run by model farmers (farmers targeted for financing) in the three areas, with trained extension staff giving instruction (in machinery, farming, management) to farmers, and also

³² Consulting fees for constructing the TSL implementation setup, in which training of implementation workers plays the central role, are covered as part of the TSL Project costs. Branch computerization, mobilization, and adoption of management software to enhance TSL operations are to be performed systematically by MADB within the project margin.

establishing monitoring processes (to monitor the outcome of instructor training and the outcome of instruction). The aims of the project are to enhance agricultural productivity in the three areas through the mechanization of agriculture, and to develop the capacity of the MOAI's extension staff. Existing activities in the three areas include "The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone", which began in October 2013, and in the delta region, "The Project on the Development of Participatory Multiplication and Distribution System for Quality Rice Seed", which began in 2011, and "The Project for Rehabilitation of Irrigation Systems", which is due to begin in FY 2014. Supporting mechanization for those farmers benefitting from technical assistance, the effects of the TSL project is also expected to be increased by the synergy with these projects that are already in motion.

2. Possibility for Farmland-collateral Loans

New Farmland Law was enacted in 2012 March 30³³, and then the farmland registration system is started by the authorized organization (for example of the village, farmer should register his farm at the village administrator). Now it is under processing at the whole country of Myanmar. For Ayeyarwady and CDZ, Shan State (South) almost finished the farmland registration process. According to the Farmland Law (2012), registered farmland has been recognized as collateral for loans. Recently, the roadside farmlands around the large cities are traded relatively freely. But actually MADB has made a practice of using the farmer's house and residential land as Term Loan collateral. After the new Farmland Law (2012) was enacted, Term Loans have not been provide, so there has been no practice in accepting registered farmland as collateral for loans. Therefore, with the permission of MOAI, it is possible that MADB accept the farmland as collateral of TSL.

The Study Team would recommend that MADB shall attempt to set up the farmland-collateral loan scheme as a pilot project. If MOAI determined the instruction which allows the farmland-collateral loans for MADB, it will be highly expected that medium-sized farmers around the large cities will be able to make smooth applications for the Two-Step Loan.

3. Collaboration with Ministry of Livestock, Fisheries and Rural Development with related associations in the 3 Agricultural TSL Project areas

The sustainable growth of agriculture is a prerequisite for eliminating poverty in farming households.

³³ In article 9 (Kha) of the New Farmland Law (2012), it is written as follow; "a part of farmland or all the area of farmland which the farmer registered can sale, lend, give, exchange, offer as collateral". But there is one exception land for "Mye Nu Kyun", which is so called the area of movable land shape by water current.

From the financial perspective, it is necessary for access to financing to be extended to all players involved with agriculture. One issue here is that the MADB currently only provides financing to a narrow range of players, making it difficult to successfully provide financing.

Sustainable growth of agriculture requires levels to be raised, not just for smallholders, but also for medium-size farms, and for players involved with the production, transportation/storage, processing, and sales of agricultural products. If there are impediments at any of these stages, it will be difficult for farmers to raise their incomes. For example, if a paddy farmer increases production volume, any substantial deterioration of quality or loss during harvesting, storage, transportation or milling stage will keep eventual retail prices down. As a result, the farmer will not meet his revenue target and will have to bear the loss. This structure is fractured into many segments, including the national level, region level, rural community level, and crop level. It also occurs at the farmer level. For instance, imagine a case where a farmer takes out a loan to buy agricultural machinery and successfully raises work efficiency. However, using low quality fertilizer results in poor crop growth and the farmers may find it hard to repay the loan.

Consequently, in order to support the modernization of agriculture from the financial standpoint, MADB needs to gain an understanding of the circumstances of borrowers, and at the level of rural communities and regions needs to shift its business strategy step by step, working through public- and private-sector collaboration to broaden the scope of eligibility for financing³⁴ to the various players that make up the agricultural supply chain.

The Myanmar Agricultural and Rural Development Bank Law (1990) enables the loans to a broad range of entities involved with agriculture, and the bank has already made loans to state-owned and private enterprises, and to livestock farmers. Consequently, with the exception of human resources constraints, there are no significant problems to the MADB advancing loans to a broader range of entities. Nevertheless, the agricultural industry has a very broad base, and to actually provide financing, both the MADB and applicants would come across obstructions in the form of territorial issues concerning administrative regions and vested interests.

Consequently, we propose that for the TSL project, the Myanmar government should designate the three areas that are the main target for the investment as the TSL model areas, making them into special zones where MADB can provide financing in an effective manner, collaborating with and working across jurisdictional or administrative boundaries between government agencies, between the public and private sectors. The proposals set out below are made on the assumption that such an

³⁴ The proposed Executing Agency for the TSL Project is the MADB. This choice has been made on the assumption that the MADB continues to be a policy finance institution, so large holders and large agricultural based businesses will of course be excluded from receiving finance under the project. Where loans are made to private companies, they would be local SMEs contributing to regional development in rural communities.

agricultural TSL model region designation can be made.

3-1. Medium- to long-term finance for farmers and regional based agribusinesses recommended by officially recognized non-profit producers' associations

To push forward with the modernization of agriculture in Myanmar, MADB needs to expand the scope of its financing, through the TSL Project, to include medium-size farmers and agri-business players involved with the production, transportation/storage, processing, and sales of agricultural products. These farmers and other players have established non-profit agricultural related associations which are working for the growth of the agricultural industry by providing members with services such as opportunities to exchange information, education, and issue of certificates. The participants in these agricultural associations will play a vital role in strengthening the international competitiveness of Myanmar's agriculture, and the development of appropriate industry groups is compatible with the objectives of the TSL Project. Since the main aim of the agricultural TSL is the extension of good agricultural machinery to farmers, we propose an operational tie-up with the Myanmar Paddy Producers Association as a model case, monitoring the tie-up, and progressing to closer involvement through expansion to other organizations such as Myanmar Rice Millers' Associations within the project period.

MPPA is a "company limited by shares" under the Myanmar Companies Act. It is one of the 36 associations representing different industry sectors that belong to the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI). MPPA was established in 2005 (and has continued to renew its company registration since then). Its business objectives include the ongoing development of rice growing and related production, it has a strongly public interest nature, so does not pursue profit. Revenues come from enrollment fees and annual fees paid by members, and from fees associated with certificates of origin. It has some 250 branches around the country, and its members make up about 30% of total paddy farmers in Myanmar. Its operations consist of the purchase and supply to farmers of fertilizers and seeds, purchase and provision (through installment sales) to farmers of agricultural machinery (including Kubota combine harvesters), technical guidance and farming guidance.

The collaboration would take the form of submitting loan application and agreement forms to the MADB along with recommendation letters from the MPPA for a predetermined number (20) of top-class individual medium-size farmers each year in the three areas. Applications would be evaluated by the MADB according to its specified procedures, but the number of guarantors required would be reduced to one for applicants recommended by the association. The association would make available its branches in the three regions for use as platforms for user training, and would provide

advertising and publicity for the TSL Project. It would also facilitate detailed monitoring of the recommended farmers as model farmers. After observing the performance of the collaborative setup with the MPPA, collaboration would be expanded sequentially to include producers associations such as those for vegetable and fruit producers, and also to associations representing businesses related to agriculture, such as rice milling. The implementation of this proposal is expected to be effective in terms of Agricultural TSL Project penetration among farmers, expansion of the scope of MADB customers, and provision of more comprehensive services by the association to its members.

3-2. Medium-term finance for livestock breeding and fisheries

Policies to promote livestock breeding and fisheries are essential for rural development, and particularly for strengthening the livelihoods of farmers living in poverty, but at the moment, the only institution providing financing is GTB, the private sector bank, which makes short-term loans of small amounts at an annual interest rate of 13%. GTB has its origins in the state-owned Livestock and Fisheries Development Bank, so it has accumulated appropriate experience and assessment skills, but there are constraints on interest rates and limits to what a private-sector bank can be expected to handle. In practice, smallholders borrowing from GTB find that the amount of financing available is far from sufficient to cover the rising cost of feed, etc., and that the interest is a heavy burden. Furthermore, smaller livestock breeders experience greater prejudice regarding the breeding of animals for human consumption, and have a need for specialist knowledge concerning action required in the case of epidemics, etc. Consequently, we propose that the TSL Project ties up with the Ministry of Livestock, Fisheries and Rural Development in the three areas to provide mid-term financing. If financing by the MADB is problematic, Steering Committee should investigate the participation of GTB as a PFI, even though it is a private-sector bank. This is expected to bring positive results for rural development and for strengthening the livelihoods of farmers.

4. Countermeasures against Farmers' Over-Indebtedness Issue

Rural community surveys have revealed that there are many poor farmers in Myanmar's rural communities. In order to perform sustainable agriculture and rural development, at the same time as taking an approach that targets the large and medium-size farms with financing for equipment as envisaged for the TSL Project, there is a need for an approach to alleviate poverty in the BOP (base of the pyramid) demographic.

As a policy for alleviating the over-indebtedness issue in the BOP demographic, it is important to fully practice and revise the Microfinance Business Law. Myanmar enacted its Microfinance Business Law on November 30, 2011. The law is currently only applied within a narrow range, so it is hoped

that the current law will be applied more broadly in order that microfinance business institutions (MFIs) can become more active in the future. Specific examples of activities required include 1) enabling remittances, 2) carrying out the insurance business, and 3) borrowing assets from local and international sources.

In general, simply tightening restrictions on informal finance does not generally result in the elimination of such finance. Instead, it tends to go underground, with interest rates and conditions becoming even less favorable to the borrower. In contrast, fully applying the Microfinance Business Law can lead to the growth of good MFIs, which is expected to result in a fade out of the informal lenders that are a hotbed for over-indebtedness issues of farmers in Myanmar.

5. Challenges for MADB

As the Study Team pointed out in Chapter 2, most of the farmers are not satisfied with MADB's seasonal loan. However, MADB is required to pay 75% of the operating profits to the government. In addition, it is needed to obtain the permission from the government for facility investments such as vehicles and computers. Thus MADB is unable to solve the issue of access to farmers by itself. To improve access to farmers, restart of the "village-banking" should be considered with the measure to prevent impropriety.

Regarding the shortage of working capital for farmers, the total disbursed loan amount of MADB has increased dramatically in the recent years. It means that farmers can cover around half the amount of the production cost by using seasonal loan. From observation in the villages as the supplemental survey, the problems of providing loan by cash were pointed out. For example, widespread use of poor-quality fertilizers and diversion of payments for purposes other than the original intent are an issue.

6. ODA Publicity

To provide publicity and a communications function for this project, we propose establishing a website and using it to communicate information. However, a large proportion of the target end users of the loans are likely to be farmers. Considering ICT availability and literacy levels in rural communities, a website will not necessarily have a large impact. For this reason, we propose additional means of communication, including publishing publicity articles in the MOAI's newsletter and in newspapers in the model regions, securing broadcasting time in radio programs to introduce the project and to air commercials, collaborating with agriculture programs on TV, installing

billboards, and distributing pamphlets.

For communication via agricultural and agriculture-related groups that are in contact with end users, we suggest collaboration with agricultural associations that are members of UMFCCI. For example, when we asked the Myanmar Paddy Producers Association (MPPA) for collaboration in organizing seminars at local branches as a means for the project to convey announcements, the MPPA responded that it was keen to assist. For the future, we propose building collaborative relationships with agriculture-related groups other than the MPPA, and using them for communications.

Appendix I: Procedures for Term Loan

1. The Procedures for Disbursement of Term Loan

To finance loans to purchase farm machinery, the procedures that must be done are as follows:

(A) Loan proposal, appraisal and submission for loan sanction

The borrower has to go to the township branch office in person and to get MADB Term Loan Form (1) (Loan Application Form) and Form (2) (Farm Production Form- Cash flow Analysis).

The Branch Manager and staff have to explain how to fill up the Forms.

The borrower has to submit the forms with the recommendation of the Ward/Village tract concerned.

The Branch Manager has to go to the village tract concerned and to make a field survey as follows: whether or not-

- The borrower could be in accordance with loan instructions
- The borrower will have repayment capacity
- The borrower's property that will be used as collateral to the bank is sound.

Then, the Branch Manager has to submit the loan application forms with his/her recommendation to the State/Regional Branch Manager to get the loan sanction.

The State/Regional Branch Manager has to recheck and endorse with recommendation. After that, he/she will submit the case and will give allotment to the Township Bank through the State/Regional Branch Manager.

(B) The Procedures that must be done during the Loan Disbursement

The State/Regional Branch Manager has to allow the Township bank to give out loans after getting loan sanction from H. O.

The Township Branch Manager must call the borrower to the Township Branch Office and give out the loan individually.

The Township Branch Manager has to supervise the borrower to purchase the farm machinery which was described in the loan proposal; confirm whether or not the borrower bought the right farm machinery and accessories in accordance with loan allotment; and whether the borrower bought the farm machinery with the right horsepower in accordance with loan proposal.

(C) The Procedures after disbursement of Term Loan

The Township Branch Manager has to make following field survey within 15 days after loan disbursement;

-By checking the brand name, the model no. of the farm machinery.

-By taking photographs the borrower together with the farm machinery bought by loan.

After that, the Branch Manager has to submit his/her field survey result to the H.O.

The Township Branch manager has to systematically submit farm machinery loan case documents with refund of the allotment to the State/Regional Manager. The State/Regional Manager has to continue to submit the paper documents of the loan case to the H.O.

After carrying out above procedures for each loan case, the Township Manager has to keep loan documents for borrowers separately.

2. Loan Instructions

- (a) The borrower must be the head of the household and must have the certificate of land title.
- (b) He must at have at least a 20 acre farm. He must have a saving account at MADB and must pledge 30% of saving amount of the value of the farm machinery. Besides, he must be able to repay.
- (c) The borrower must put up his/her immovable and movable properties to the bank as collateral. Moreover, he/she must put up two guarantors with their properties. (The two guarantors must not be the borrowers of farm machinery loans from MADB).
- (d) If the borrower fails to repay the loan for various reasons, the two guarantors must pay back the loan.
- (e) If the applicant gets the loan, he must buy only brand new farm machinery. He must put up such farm machinery bought by loan to the bank as collateral.
- (f) Without full repayment of the loan, the borrower must not transfer the farm machinery bought by loan for selling, or mortgaging or giving away in charity.
- (g) The borrower must be checked by the Township Branch Manager until full repayment of the loan.
- (h) If the borrower did not buy the farm machinery, he must repay loan principal with due interest and penal interest at once. If necessary, legal action must be taken against him.
- (i) The borrower must agree that the bank will recover the loan as if it is arrears of land revenue.

3. Saving as collateral for the Loan

The applicant who wants to get a farm machinery loan has to open a saving account at MADB and save 30% of the total value of farm machinery. The bank will recollect the loan within 3 years with 3 installments.

4. Loan Principal Collection

In collecting the farm machinery loan principal, the bank will deduct the savings amount from the total loan and has to collect the remaining amount in 3 installments as follows:

- (a) For the first collecting installment, the bank has to recover 35% of the residual principal amount.
- (b) For the second collecting installment, the bank has to recollect 35% of the residual principal amount.
- (c) The third step is that the bank has to recover 30% of the residual principal amount and has to subtract the saving amount.

5. Interest Collection

There are 3 steps in collecting interest;

- (a) The first step is to collect the interest on the total loan principal.
- (b) The second step is to collect the interest on the residual principal amount after deduction of the first installment from the total loan principal.
- (c) The third is to collect on the residual principal amount after deduction of the first and the second installments from the total loan principal.

6. Penal Interest

If the borrower fail to repay the loan on due date, he/she has to pay 1% penal interest per month for the period beginning from the date of default of repayment.

Appendix II: Selection of PFI

1. Selection Criteria for PFIs

It is recommended that the PFI(s) shall be selected in accordance with the following accreditation criteria.

(1) Logical Basis

The logical basis of the PFI selection criteria should be determined with the following two policies: 1) adoption of the CAMEL approach; and 2) additional criteria necessary to achieve the objectives of the TSL.

1) Adoption of CAMEL Approach

In order to ensure transparency, it is important to adopt international best practice as the framework for the selection criteria. The CAMEL approach is generally used by bank supervisory authorities to evaluate each bank on the basis of five measures of operations and performance. CAMEL stands for Capital, Asset Quality, Management, Earnings and Liquidity. The Central Bank of Myanmar (CBM) has begun to make the use of CAMELS as a monitoring indicator under the current regulatory framework. According to the interview with CBM, the conventional CAMEL-based selection criteria are still in line with the CBM's policy and its future direction and also can be accepted by the parties concerned. Therefore, the Study Team recognizes the CAMEL approach as the most appropriate framework for selecting PFIs of the TSL.

2) Additional Criteria Deemed Necessary

The Study Team proposes additional criteria deemed necessary to achieve the objectives of the TSL. Specifically, additional important aspects of the bank are the following: 1) Public disclosure; 2) The funding of medium- to long-term funds; 3) Agricultural financing; and 4) Geographic coverage.

Public disclosure: The banks are reluctant to disclose important indicators showing their financial soundness. The lack of transparency may delay the improvement of corporate governance and, in the worst case, lead to a deterioration of their loan assets in the future. Therefore, criteria relating to public disclosure are quite necessary for the selection of PFIs.

Medium- to long-term funding capability: Because the TSL aims to provide medium- to long-term funds to finance medium- to long-term loans to farmers/agribusinesses, the TSL project is focused on the banks' lacking access to medium- to long-term funds.

Agricultural financing: Candidate banks' efforts to increase agricultural financing need to be

evaluated to select the most highly motivated banks as PFIs.

Geographic coverage: A wide geographic coverage in the branch network is important for extending the two-step loans to a greater number of farmers/agriculture-based businesses in Myanmar.

(2) Three Categories of Points and Their Allocation

The PFI selection criteria is composed of three categories: (A) Financial soundness, which is the most important aspect required to be a PFI, is evaluated based on the CAMEL approach; (B) Governance & management which is an important non-financial aspect of a candidate bank not only showing the current operational soundness but also ensuring the bank’s future financial soundness; and (C) Competence/necessity to participate in the TSL.

The allocation of points under the three criteria is shown in the table below. The maximum number of points is 100. Because among the three categories the financial soundness is the most important to ensure the soundness of the whole scheme, more emphasis is given to financial soundness than to non-financial categories. In the category of the financial soundness, while the four criteria of capital adequacy, profitability, liquidity and transparency are given 10 points each equally, the asset quality criterion is given 20 points taking into account its significance in ensuring the financial soundness of banks. The remaining 40 points are allotted to the two non-financial categories equally.

Table 1. Summary of the PFI Selection Criteria

Category	Criterion	Points
A. Financial Soundness	1. Capital Adequacy 2. Asset Quality 3. Profitability 4. Liquidity 5. Transparency	Maximum 60 Points
B. Governance and Management	1. Governance 2. Risk Management	Maximum 20 Points
C. Competence/Necessity to Participate in the TSL	1. Focus on Farmers 2. Necessity of Medium- to long-term Funds 3. Other Competence	Maximum 20 Points

Source: Prepared by the Study Team (August 2013)

2. Simulation of PFIs’ Selection

Under the expected TSL project, it is recommended that the PFI(s) shall be selected based on the following steps:

- (1) **Scoring:** Candidate banks shall be scored in accordance with the selection criteria;
- (2) **Pre-screening:** The candidate banks that are scored below 50 points shall be deemed as ineligible for the TSL. In such a case, the procedure of the provisional accreditation shall be taken;
- (3) **Ranking:** The candidate banks that are scored 50 points or above shall be ranked in accordance

with their scores; and

- (4) **Selection:** The candidate banks with higher scores shall be selected as a PFI by Steering Committee.

At this stage, based on the above selection criteria, the Study Team made a simulation to select the PFI(s) of the TSL with the gathered data and information.

Both MADB and GTB have shown their interest expressively in joining the TSL. The interview survey suggests that other PFI candidate banks are not interested very much in joining in the TSL scheme, mainly because they are not focusing on agricultural financing as of today. In addition, the Study Team would recommend that the number of PFIs be one or two, in order to implement the first TSL scheme smoothly in Myanmar.

The table below shows the result of scoring of the five surveyed banks that are ranked in accordance with their obtained total scores. Because KBZ BANK, MEB and SMIDB are scored below 50 points, they are deemed as ineligible to be a PFI as of now. If the number of PFIs is one or two, GTB and/or MADB would be selected as a PFI of the TSL. If the number of PFI is one for the initial stage of the TSL project in Myanmar, it might be an efficient and quick way that MADB as the only policy-based agriculture bank will play the roles of both Executing Agency and PFI. However, the financial sustainability of MADB relies on the fact that MADB is recognized as a part of MOAI. Special caution on the weak financial position, high liquidity risk and governance problems would need to be exercised in MADB under the TSL project.

Table 2. Result of Scoring for the Selection of PFIs for the TSL

Rank	Bank Name	A. Financial Soundness	B. Governance & Management	C. Competence/Necessity to participate in the TSL	Total
1	GTB	43	9	7	59
2	MADB	33	1	17	51
3	KBZ BANK	43	1	4	48
4	MEB	29	4	10	43
5	SMIDB	31	1	-1	31

Source: Prepared by the Study Team (September 2013)

In the TSL, a PFI needs to be accredited in accordance with accreditation criteria once a year when their financial statements are audited. The selection criteria set in this study shall be also deemed as annual accreditation criteria.

In case the total score of a PFI falls below 50 points, it may be provisionally accredited. The bank must acknowledge the need for improvement in the problematic criteria and target improvement in these areas. The bank shall then prepare and submit to the PIU of TSL and JICA for the approval on

an Institutional Development Plan along with adequate training programs and a detailed timetable for achieving improvement. The Steering Committee and PIU shall be responsible for monitoring and supervising the implementation of the plan on a semi-annual basis. The results shall be reported to JICA.

ANNEX

RESULT OF FARM HOUSEHOLD ECONOMY SURVEY

1. General Information

1.1 Family members

Household Head (n=480)

	No.	%
Male	473	99%
Female	7	1%
Total	480	100%

Average Family Members (n=480)

	South Shan	Bago West	Ayeyarwady	Total
Average	4.8	4.2	4.2	4.5
Max	10.0	9.0	7.0	10.0
Minimum	2.0	1.0	1.0	1.0
Median	5.0	4.0	4.0	4.0
Mode	4.0	4.0	4.0	4.0

No. of Students & Working in Agriculture (n= 480)

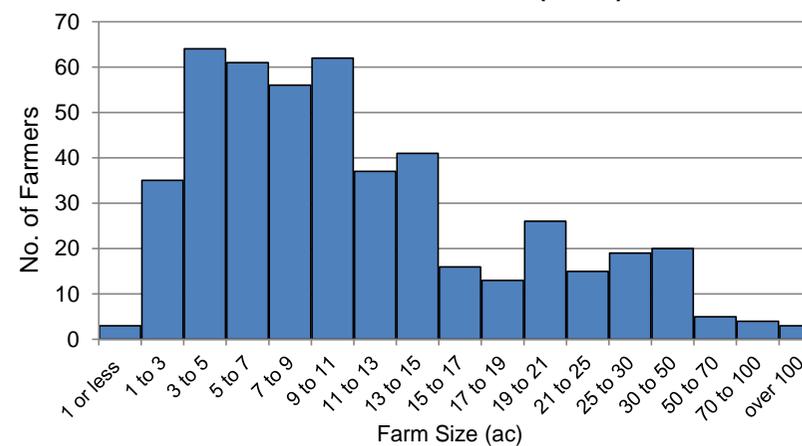
	Students	Working in Agriculture
Average	1.0	2.9
Max	5.0	8.0
Minimum	0.0	0.0
Median	1.0	3.0
Mode	0.0	2.0

Farm Size (n=480, unit:ac)

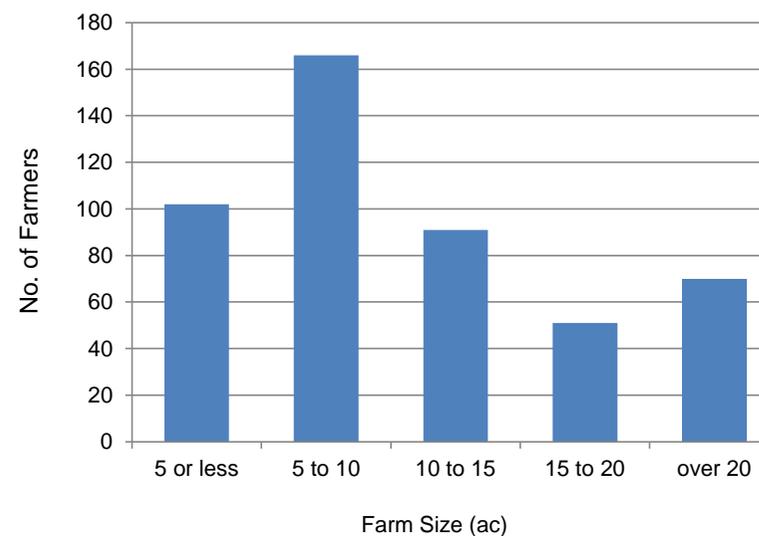
	Total	Upland	Paddy land
Average	14.4	4.6	9.6
Max	300.0	240.0	94.0
Minimum	1.0	0.0	0.0
Median	10.0	0.0	6.8
Mode	10.0	0.0	0.0
SD	20.7	16.9	10.9

Range (ac)	No of Farmers	%
5 or less	102	21%
5 to 10	166	35%
10 to 15	91	19%
15 to 20	51	11%
over 20	70	15%
Total	480	100%

Farm Size Distribution (n=480)

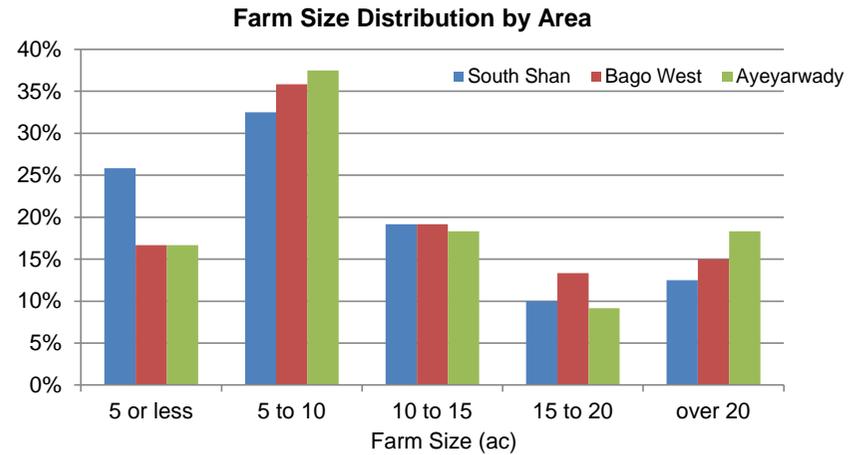


Farm Size Distribution (n=480)



Farm Size Distribution (n=480)

Range (ac)	No. of Farmers
1 or less	3
1 to 3	35
3 to 5	64
5 to 7	61
7 to 9	56
9 to 11	62
11 to 13	37
13 to 15	41
15 to 17	16
17 to 19	13
19 to 21	26
21 to 25	15
25 to 30	19
30 to 50	20
50 to 70	5
70 to 100	4
over 100	3
Total	480



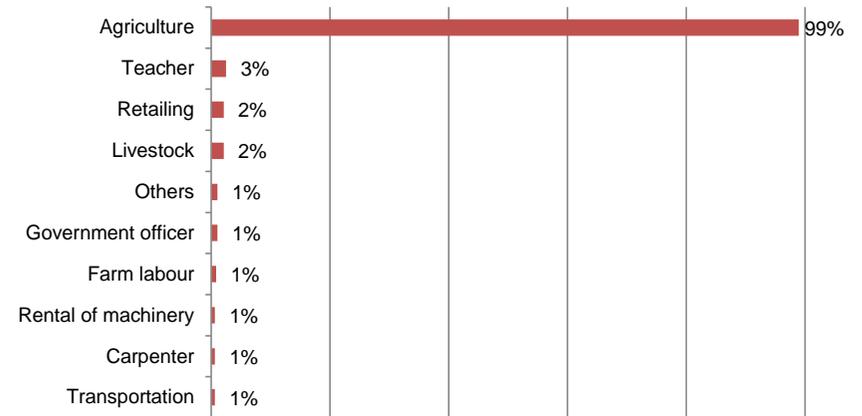
	South Shan	Bago West	Ayeyarwady
Upland	9.0	0.2	0.6
Paddy land	5.7	14.0	13.1
Total average	15.0	14.1	13.8

	Range (ac)	South Shan	Bago West	Ayeyarwady	South Shan	Bago West	Ayeyarwady
Total	5 or less	62	20	20	26%	17%	17%
4.6	5 to 10	78	43	45	33%	36%	38%
9.6	10 to 15	46	23	22	19%	19%	18%
14.4	15 to 20	24	16	11	10%	13%	9%
	over 20	30	18	22	13%	15%	18%
	Total	240	120	120	100%	100%	100%

Income Source (n=480, multiple answers)

	Main Income	%	Sub-income	%
Cnstruction labour	1	0%	5	1%
Middleman	2	0%	4	1%
Remitment	2	0%	6	1%
Transportation	3	1%	3	1%
Carpenter	3	1%	5	1%
Rental of machinery	3	1%	2	0%
Farm labour	4	1%	10	2%
Government officer	5	1%	18	4%
Others	5	1%	13	3%
Livestock	10	2%	18	4%
Retailing	10	2%	23	5%
Teacher	12	3%	10	2%
Agriculture	475	99%	5	1%
Total Sample	480	111%		

Main Income Source (n=480)



Main Income Source by Farm Size (n=480, multiple answers)

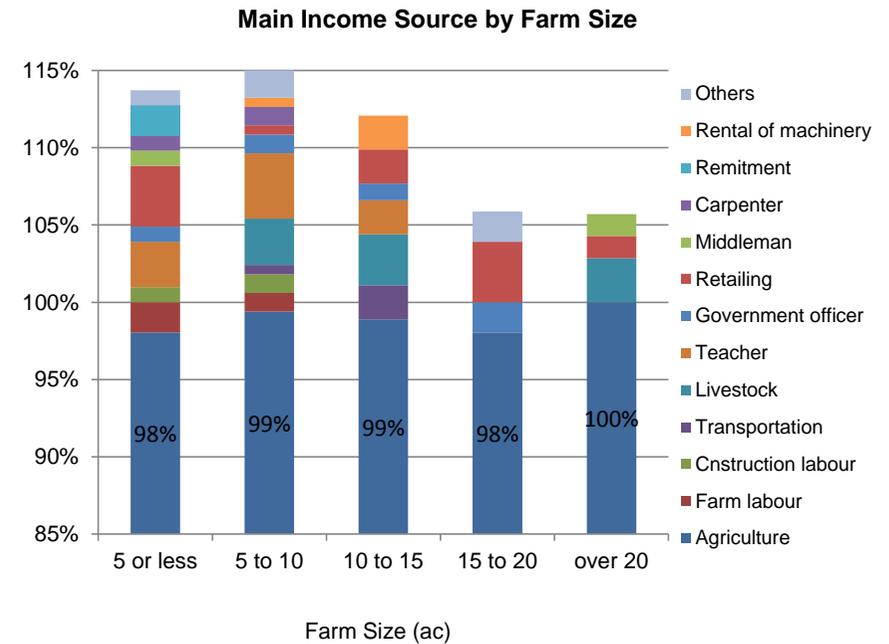
	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
Agriculture	100	165	90	50	70	475
Farm labour	2	2				4
Cnstruction labour	1	2				3
Transportation		1	2			3
Livestock		5	3		2	10
Teacher	3	7	2			12
Government officer	1	2	1	1		5
Retailing	4	1	2	2	1	10
Middleman	1				1	2
Carpenter	1	2				3
Remitment	2					2
Rental of machinery		1	2			3
Others	1	3		1		5
Total Sample	102	166	91	51	70	

Main Income Source by Farm Size (in %, multiple answers)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Agriculture	98%	99%	99%	98%	100%
Farm labour	2%	1%	0%	0%	0%
Cnstruction labour	1%	1%	0%	0%	0%
Transportation	0%	1%	2%	0%	0%
Livestock	0%	3%	3%	0%	3%
Teacher	3%	4%	2%	0%	0%
Government officer	1%	1%	1%	2%	0%
Retailing	4%	1%	2%	4%	1%
Middleman	1%	0%	0%	0%	1%
Carpenter	1%	1%	0%	0%	0%
Remitment	2%	0%	0%	0%	0%
Rental of machinery	0%	1%	2%	0%	0%
Others	1%	2%	0%	2%	0%

Main Income Source by Area (n=480, multiple answers)

	South Shan	Bago West	Ayeyarwady	Total
Agriculture	237	120	118	475
Farm labour	2	1	1	4
Cnstruction labour	0	0	1	1
Transportation	1	2	0	3
Livestock	5	2	3	10
Teacher	4	7	1	12
Government officer	3	1	1	5
Retailing	7	3	0	10
Middleman	0	1	1	2
Carpenter	2	0	1	3
Remitment	1	0	1	2
Rental of machinery	1	1	1	3
Others	2	1	2	5
No of Sample	240	120	120	480



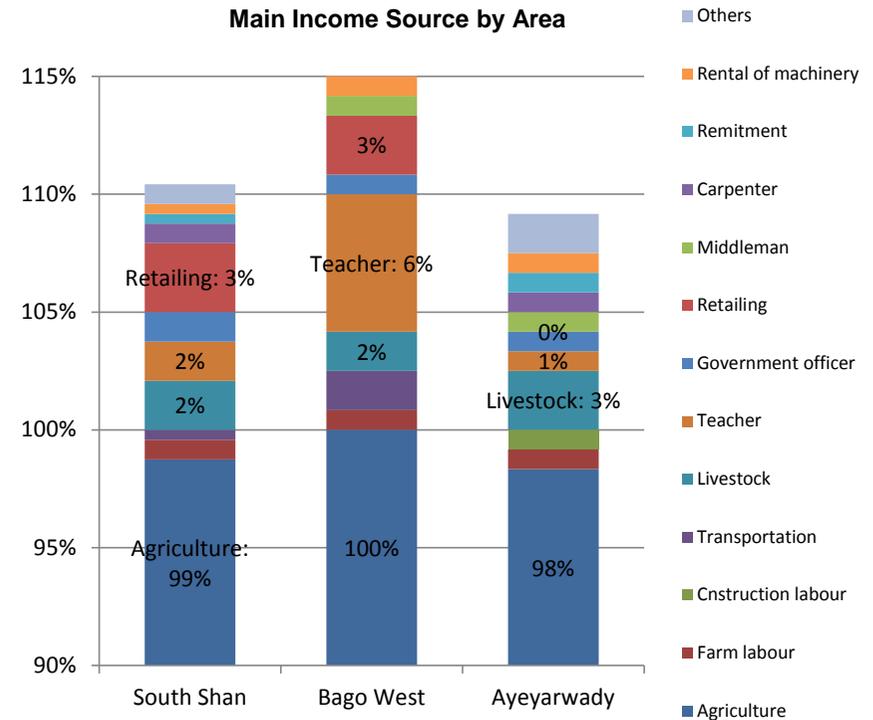
Main Income Source by Area (in %, multiple answers)

	South Shan	Bago West	Ayeyarwady	Total
Agriculture	99%	100%	98%	99%
Farm labour	1%	1%	1%	1%
Cnstruction labour	0%	0%	1%	0%
Transportation	0%	2%	0%	1%
Livestock	2%	2%	3%	2%
Teacher	2%	6%	1%	3%
Government officer	1%	1%	1%	1%
Retailing	3%	3%	0%	2%
Middleman	0%	1%	1%	0%
Carpenter	1%	0%	1%	1%
Remitment	0%	0%	1%	0%
Rental of machinery	0%	1%	1%	1%
Others	1%	1%	2%	1%
No of Sample	100%	100%	100%	100%

Annual Income (Unit: kyat/year)

	Average	Maxmium	Minimum	Median
Agriculture	4,945,385	60,000,000	150,000	3,000,000
Farm labour	366,429	900,000	100,000	340,000
Cnstruction labour	516,667	900,000	200,000	470,000
Transportation	1,700,000	6,000,000	200,000	850,000
Livestock	640,357	2,500,000	100,000	500,000
Teacher	1,367,652	5,500,000	600,000	1,200,000
Government officer	1,716,087	12,000,000	300,000	1,200,000
Retailing	1,566,970	9,000,000	100,000	1,000,000
Middleman	1,280,000	2,500,000	200,000	1,200,000
Carpenter	312,500	500,000	200,000	300,000
Remitment	1,768,750	8,000,000	400,000	1,000,000
Rental of machinery	660,000	1,800,000	100,000	500,000
Others	1,382,941	3,500,000	100,000	1,000,000
Total Annual Income	5,380,502	60,000,000	200,000	3,550,000

Main Income Source by Area



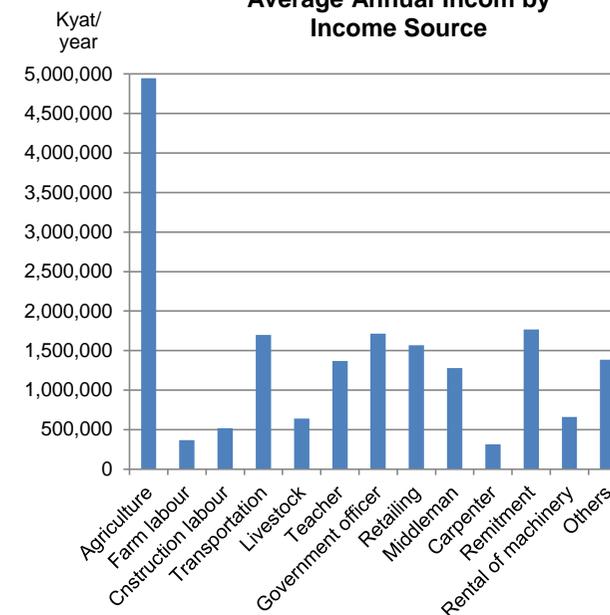
Annual Average Income by Area (Unit: kyat/year)

	South Shan	Bago West	Ayeyarwady	Total
Agriculture	4,620,813	5,069,092	5,470,825	4,945,385
Farm labour	273,000	525,000	675,000	366,429
Cnstruction labour	900,000	550,000	366,667	516,667
Transportation	350,000	1,166,667	6,000,000	1,700,000
Livestock	983,333	481,250	475,455	640,357
Teacher	1,697,143	1,277,778	1,153,714	1,367,652
Government officer	1,340,000	1,090,000	3,240,000	1,716,087
Retailing	1,264,444	2,850,000	878,571	1,566,970
Middleman	1,000,000	700,000	2,000,000	1,280,000
Carpenter	321,429	-	250,000	312,500
Remitment	950,000	450,000	3,300,000	1,768,750
Rental of machinery	450,000	1,800,000	306,958	660,000
Others	1,541,667	975,000	1,480,000	1,382,941
Total Annual Income	4,939,561	5,596,925	6,074,625	5,380,502

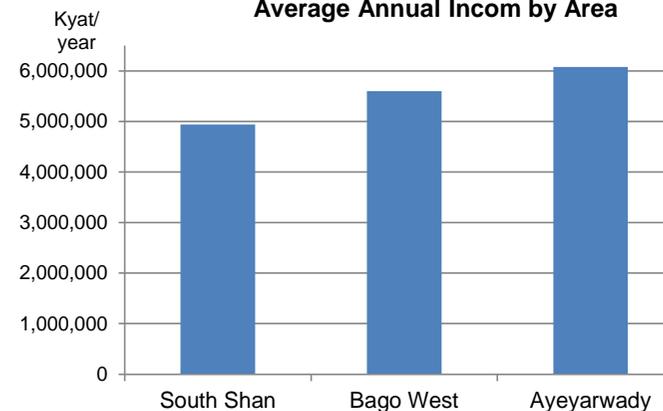
Average Annual Income by Farm Size (Unit: kyat/year)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Agriculture	1,627,892	3,252,024	4,951,209	5,625,392	13,292,129
Farm labour	446,667	163,333	310,000	-	-
Cnstruction labour	590,000	370,000	-	-	-
Transportation	1,200,000	750,000	-	-	6,000,000
Livestock	783,333	494,444	758,889	350,000	533,333
Teacher	2,833,333	1,100,000	1,192,667	1,200,000	1,200,000
Government officer	1,060,000	1,130,000	2,860,000	1,880,000	2,400,000
Retailing	644,444	1,100,000	1,751,000	4,450,000	1,000,000
Middleman	1,500,000	1,750,000	200,000	1,200,000	-
Carpenter	325,000	275,000	-	-	-
Remitment	1,050,000	712,500	1,200,000	-	8,000,000
Rental of machinery		450,000	1,150,000		100,000
Others	950,000	1,592,857	1,266,667	850,000	1,653,333
Total Annual Income	2,023,873	3,572,145	5,575,121	6,195,784	13,712,986

Average Annual Income by Income Source



Average Annual Income by Area

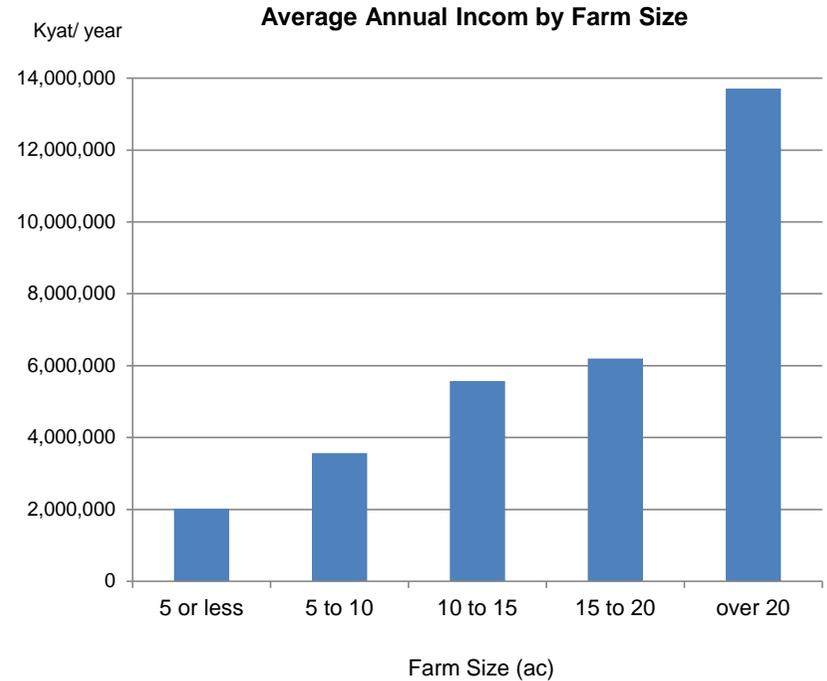
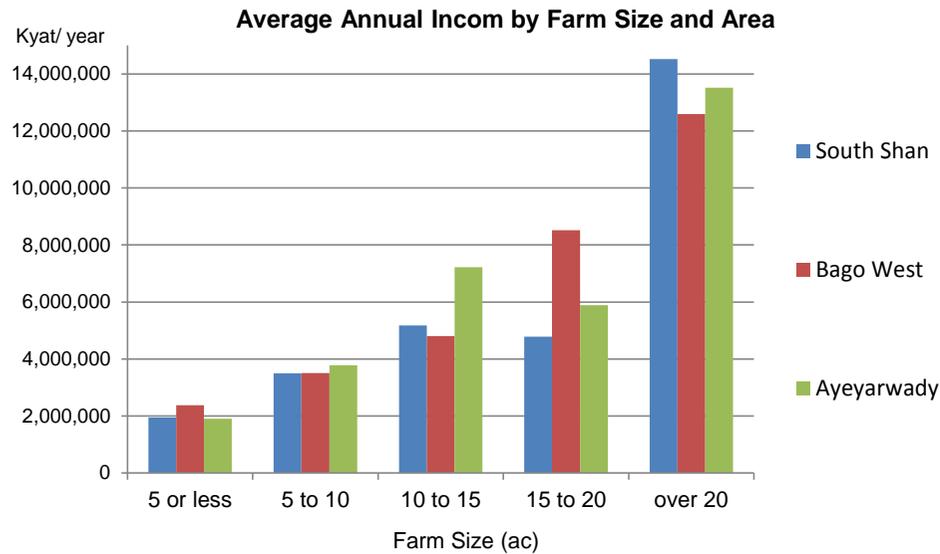


Average Annual Income by Farm Size (Unit: kyat/year)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
South Shan	1,951,129	3,492,821	5,174,130	4,786,458	14,525,333
Bago West	2,374,000	3,501,558	4,806,957	8,522,500	12,592,444
Ayeyarwady	1,899,250	3,777,089	7,216,636	5,886,364	13,522,045
Total	2,023,873	3,572,145	5,575,121	6,195,784	13,712,986

Company or Agricultural Cooperatives (n=480)

	South Shan	Bago West	Ayeyarwady	Total	Name
Yes	1	0	0	1	New Holland Co..Ltd
No	239	120	120	479	
Total	240	120	120	480	



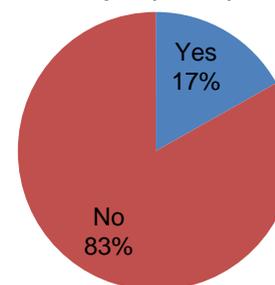
2. Financial Situation

Saving for Agricultural Input (n=480)

	South Shan	Bago West	Ayeyarwady	Total
Yes	51	13	17	81
No	189	107	103	399
Total	240	120	120	480

	South Shan	Bago West	Ayeyarwady	Total
Yes	21%	11%	14%	17%
No	79%	89%	86%	83%
Total	100%	100%	100%	100%

Saving for Agricultural Input (n=480)



Saving for Agricultural Input by Farm Size (n=480)

	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
Yes	7	25	22	8	19	81
No	95	141	69	43	51	399
Total	102	166	91	51	70	480

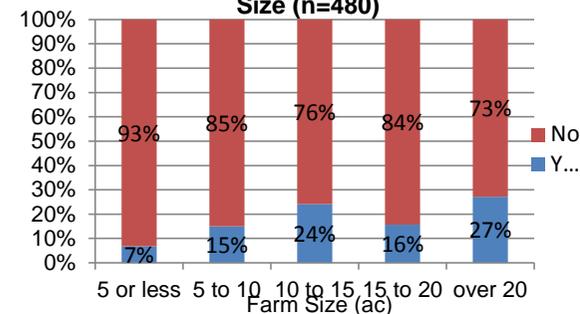
	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
Yes	7%	15%	24%	16%	27%	17%
No	93%	85%	76%	84%	73%	83%

"Yes" for Saving by Farm Size & Area (n=81)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
South Shan	6	11	16	5	13
Bago West	1	7	2	2	1
Ayeyarwady	0	7	4	1	5
Total	7	25	22	8	19

	5 or less	5 to 10	10 to 15	15 to 20	over 20
South Shan	86%	44%	73%	63%	68%
Bago West	14%	28%	9%	25%	5%
Ayeyarwady	0%	28%	18%	13%	26%
Total	100%	100%	100%	100%	100%

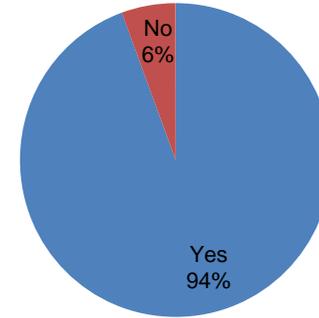
Saving for Agricultural Input by Farm Size (n=480)



Experience of Borrowing Money (n=480)

	No of Farmer	%
Yes	453	94%
No	27	6%
Total	480	100%

Do you have experience of borrowing money? (n=480)



The Biggest Borrowing Amount at one time (n=452, Unit: kyat/time)

	Total	South Shan	Bago West	Ayeyarwady
Average	1,292,544	1,301,613	1,228,879	1,338,067
Max	20,000,000	20,000,000	6,000,000	10,000,000
Minimum	40,000	100,000	40,000	100,000
Median	1,000,000	900,000	1,000,000	1,000,000
Mode	1,000,000	1,000,000	1,000,000	1,000,000

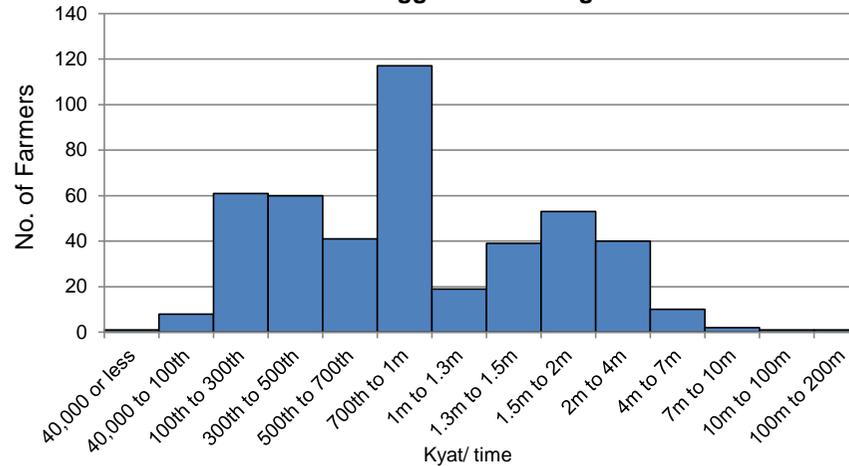
Average Biggest Borrowing Amount (Unit: kyat/time)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
South Shan	637,037	915,217	1,419,048	1,560,870	3,082,759
Bago West	367,000	905,000	1,421,739	1,606,667	2,525,000
Ayeyarwady	516,500	1,124,444	1,413,636	1,881,818	2,214,286
Total	553,936	972,821	1,418,391	1,646,939	2,671,212

Biggest Borrowing Amount Distribution

Range (kyat)	No of Farmer
40,000 or less	1
40,000 to 100th	8
100th to 300th	61
300th to 500th	60
500th to 700th	41
700th to 1m	117
1m to 1.3m	19
1.3m to 1.5m	39
1.5m to 2m	53
2m to 4m	40
4m to 7m	10
7m to 10m	2
10m to 100m	1
100m to 200m	1
Total	453

Distribution of Biggest Borrowing Amount



From where do you borrow? (n=310)

	No of Farmers	%
MADB	115	37%
Private lenders	176	57%
Relative	14	5%
Friends	2	1%
	3	1%
	310	100%

From where do you borrow? By farm size (n=310)

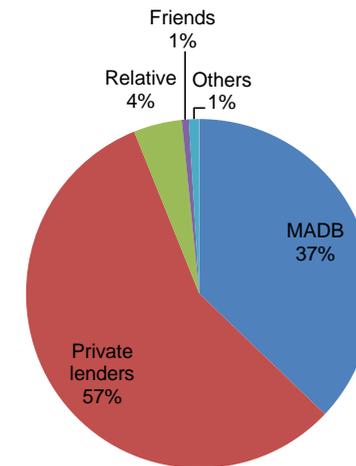
	5 or less	5 to 10	10 to 15	15 to 20	over 20
	19	41	23	13	19
	26	60	37	22	31
	4	3	3	1	3
	1	1			
	2		1		
	52	105	64	36	53

	5 or less	5 to 10	10 to 15	15 to 20	over 20
	37%	39%	36%	36%	36%
Private lenders	50%	57%	58%	61%	58%
Relative	8%	3%	5%	3%	6%
Friends	2%	1%	0%	0%	0%
Others	4%	0%	2%	0%	0%
Total	100%	100%	100%	100%	100%

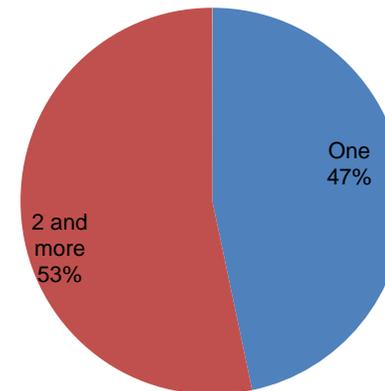
From where do you borrow? By Area (n=310)

	South Shan	Bago West	Ayeyarwady	Total
MADB	53	0	62	115
Private lenders	102	35	39	176
Relative	1	1	12	14
Friends	1	0	1	2
Others	3	0	0	3
Total	160	36	114	310

From where do you borrow money? (n=310)



How many lenders offer you loans? (n=450)



How many lenders offer? (n=450)

	Total	South Shan	Bago West	Ayeyarwady
One	210	114	62	34
2 and more	240	104	54	82
Total	450	218	116	116

	Total	South Shan	Bago West	Ayeyarwady
One	47%	52%	53%	29%
2 and more	53%	48%	47%	71%
Total	100%	100%	100%	100%

Do you still pay back?

	No of Farmers	%
Yes	452	99.8%
No	1	0.2%
Total	453	100%

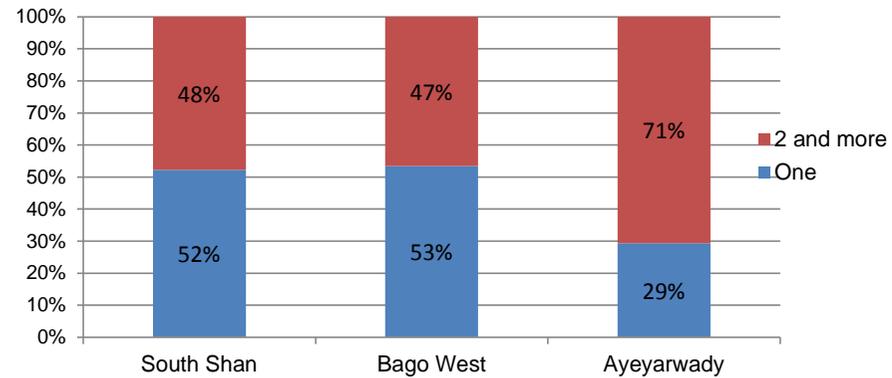
How much money do you pay back? (n=451)

	Amount (kyat)
Average	1,278,792
Max	20,000,000
Minimum	5,000
Median	1,000,000
Mode	1,000,000

How much money do you pay back? By Farm Size (n=451, Unit: kyat)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Average	614,787	998,333	3,595,402	1,593,980	2,610,606
Max	7,000,000	7,000,000	6,000,000	5,000,000	20,000,000
Minimum	15,000	70,000	100,000	5,000	500,000
Median	400,000	800,000	1,000,000	1,500,000	2,000,000
Mode	300,000	1,000,000	1,000,000	1,000,000	1,000,000

How many lenders offer you loans? (n=450)



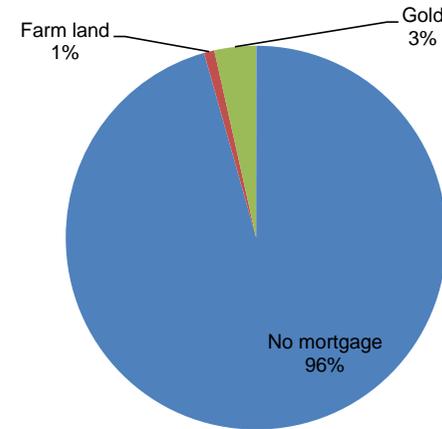
What kind of mortgage did you offer?

	No. of Farmers	%
No mortgage	433	96%
Farm land	4	1%
Gold	16	4%
Total	453	100%

Purposer of Borrowing Money (n=453, multiple answers)

	No. of Farmers	%
Housing	0	0%
Others	1	0%
Business	2	0%
Agriculture Machinery	7	2%
Foods	18	4%
Medical Treatment	19	4%
Education	47	10%
Seeds & Fertilizers	451	100%
No of Sample	453	100%

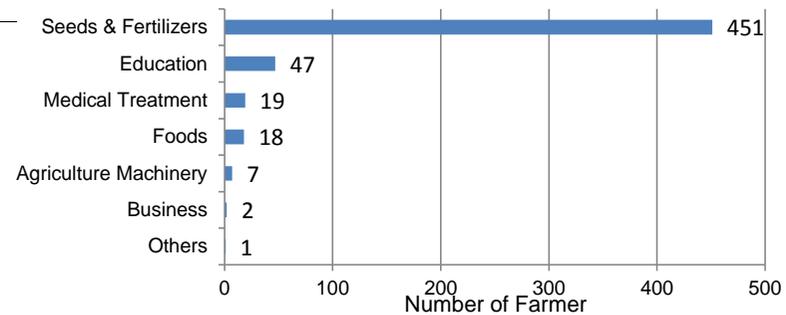
What kind of mortgage did you offer? (n=453)



	South Shan	Bago West	Ayeyarwady	Total
Seeds & Fertilizers	216	116	119	451
Foods	6	7	5	18
Education	26	11	10	47
Medical Treatment	7	2	10	19
Business	0	0	2	2
Agriculture Machinery	6	1	0	7
Housing	0	0	0	0
Others	1	0	0	1
No of Sample	218	116	119	

	South Shan	Bago West	Ayeyarwady
Seeds & Fertilizers	99%	100%	100%
Foods	3%	6%	4%
Education	12%	9%	8%
Medical Treatment	3%	2%	8%
Business	0%	0%	2%
Agriculture Machinery	3%	1%	0%
Housing	0%	0%	0%
Others	0%	0%	0%

What is the purpose for borrowing money? (n=453)

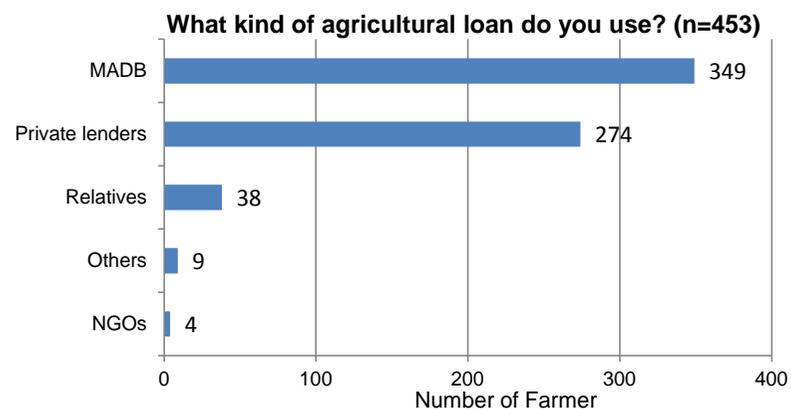


	5 or less	5 to 10	10 to 15	15 to 20	over 20
Seeds & Fertilizers	93	156	88	48	66
Foods	4	8	2	2	2
Education	10	16	12	6	3
Medical Treatment	4	5	6	3	1
Business	0	0	1	0	1
Agriculture Machinery	0	1	2	1	3
Housing	0	0	0	0	0
Others	1	0	0	0	0
No of Sample	94	156	88	49	66

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Seeds & Fertilizers	99%	100%	100%	98%	100%
Foods	4%	5%	2%	4%	3%
Education	11%	10%	14%	12%	5%
Medical Treatment	4%	3%	7%	6%	2%
Business	0%	0%	1%	0%	2%
Agriculture Machinery	0%	1%	2%	2%	5%
Housing	0%	0%	0%	0%	0%
Others	1%	0%	0%	0%	0%
	100%	100%	100%	100%	100%

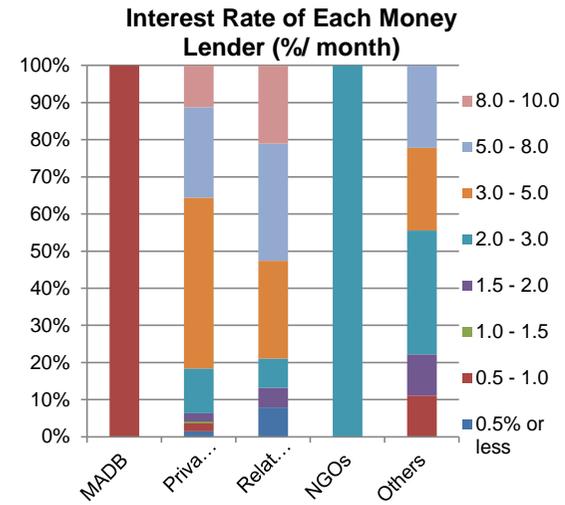
What kind of agricultural loan do you use? (n=453, multiple answers)

	No. of Farmers	%
NGOs	4	1%
Others	9	2%
Relatives	38	8%
Private lenders	274	60%
MADB	349	77%
Total Sample	453	



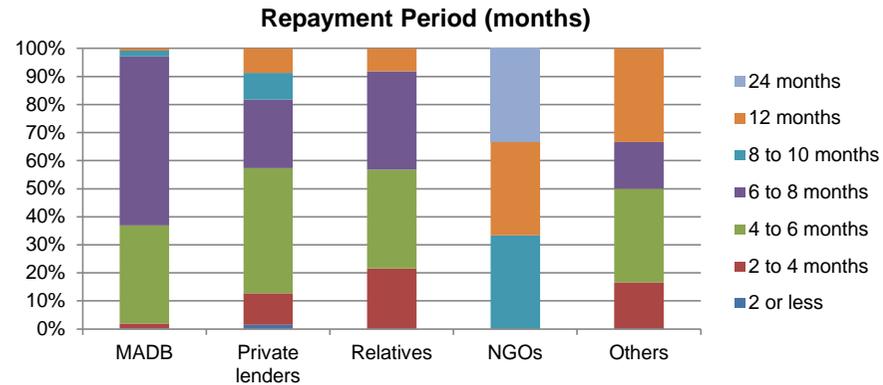
Interest Rate of Money lenders (Unit: number of answers)

Interest (%/month)	MADB	Private lenders	Relatives	NGOs	Others
0.5% or less	0	4	3	0	0
0.5 - 1.0	348	6	0	0	1
1.0 - 1.5	0	1	0	0	0
1.5 - 2.0	0	6	2	0	1
2.0 - 3.0	0	32	3	4	3
3.0 - 5.0	0	123	10	0	2
5.0 - 8.0	0	65	12	0	2
8.0 - 10.0	0	30	8	0	0
Total Answer	348	267	38	4	9



Repayment Period (Unit: number of answers)

Period (months)	MADB	Private lenders	Relatives	NGOs	Others
2 or less	1	4	0	0	0
2 to 4 months	6	31	8	0	1
4 to 6 months	121	122	13	0	2
6 to 8 months	208	67	13	0	1
8 to 10 months	7	26	0	1	0
12 months	3	24	3	1	2
24 months	0	0	0	1	0
Total Answer	346	274	37	3	6



Type of loan from MADB

	No. of Farmers	%
Seasonal loan	421	100%
Term loan	1	0%
Total	422	100%

Do you borrow seasonal loan every year?

	No. of Farmers	%
Yes	448	99%
No	3	1%
Total	451	100%

Which month do you borrow money?

	No. of Farmers	%
Jan	6	1%
Feb	6	1%
Mar	10	2%
Apr	52	11%
May	70	15%
Jun	127	28%
Jul	110	24%
Aug	47	10%
Sep	2	0%
Oct	19	4%
Nov	0	0%
Dec	4	1%
Total	453	100%

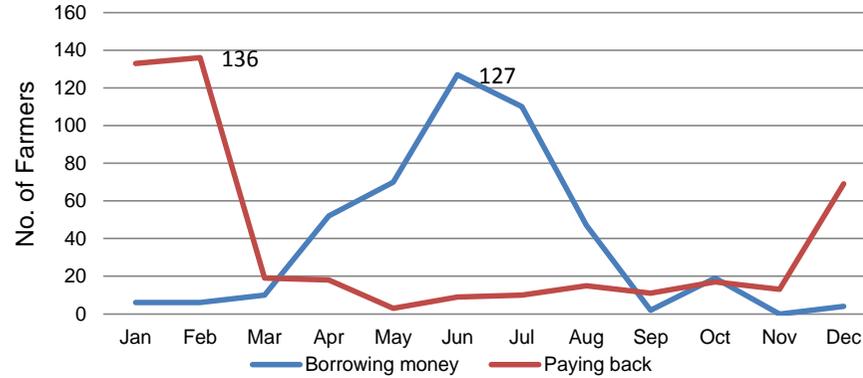
Which month do you pay back?

	No. of Farmers	%
Jan	133	29%
Feb	136	30%
Mar	19	4%
Apr	18	4%
May	3	1%
Jun	9	2%
Jul	10	2%
Aug	15	3%
Sep	11	2%
Oct	17	4%
Nov	13	3%
Dec	69	15%
Total	453	100%

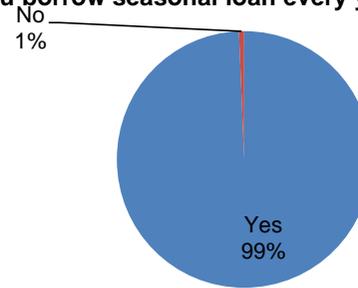
Which is easier to borrow money from MADB or Private lenders?

	No. of Farmers	%
MADB	147	33%
Private lenders	305	67%
Total	452	100%

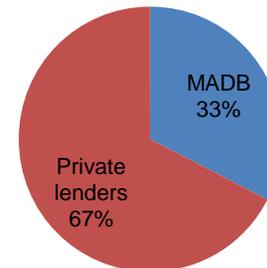
Which month do you borrow and pay back money? (n=453)



Do you borrow seasonal loan every year? (n=451)



Which is easier to borrow money from MADB or Private lenders? (n=452)



Reasons for choosing MADB or Private lenders (Unit: number of farmers)

Reasons	MADB	Private lenders
Easy	11	300
Low Interest	115	1
Enough Amount	1	1
Others	17	3
Total	144	305

How much do you borrow at one time? (Unit: kyat)

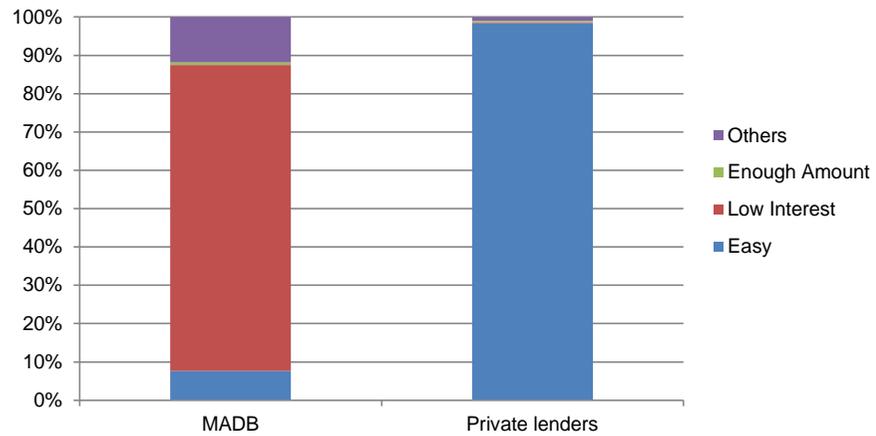
	Total Area	South Shan	Bago West	Ayeyarwady
Average	1,649,224	2,202,546	1,212,672	1,070,420
Max	200,000,000	200,000,000	6,000,000	4,000,000
Minimum	50,000	50,000	70,000	100,000
Median	1,000,000	800,000	1,000,000	1,000,000
Mode	1,000,000	1,000,000	1,000,000	1,000,000

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Average	564,681	867,756	3,502,874	1,567,347	2,673,846
Max	7,000,000	4,000,000	200,000,000	5,000,000	20,000,000
Minimum	100,000	70,000	50,000	100,000	500,000
Median	400,000	750,000	1,000,000	1,500,000	1,800,000
Mode	200,000	1,000,000	1,000,000	1,000,000	1,000,000

Does MADB meet your demand?

	No. of Farmers	%
Yes	22	5%
No	426	95%
Total	448	100%

Reasons for choosing MADB or/and Private lenders

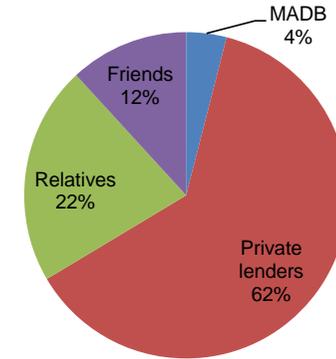


How much debt do you have now? (Unit: kyat)

	Total	South Shan	Bago West	Ayeyarwady
Average	2,056,268	2,555,405	1,481,897	1,756,303
Max	200,000,000	200,000,000	10,000,000	8,000,000
Minimum	20,000	20,000	70,000	100,000
Median	1,000,000	1,000,000	1,000,000	1,500,000
Mode	1,000,000	1,000,000	1,000,000	1,000,000

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Average	731,756	1,239,934	3,855,882	1,924,082	3,568,750
Max	7,000,000	4,000,000	200,000,000	5,000,000	20,000,000
Minimum	20,000	70,000	150,000	80,000	100,000
Median	500,000	1,000,000	1,400,000	1,900,000	2,100,000
Mode	200,000	1,000,000	1,000,000	2,000,000	1,000,000

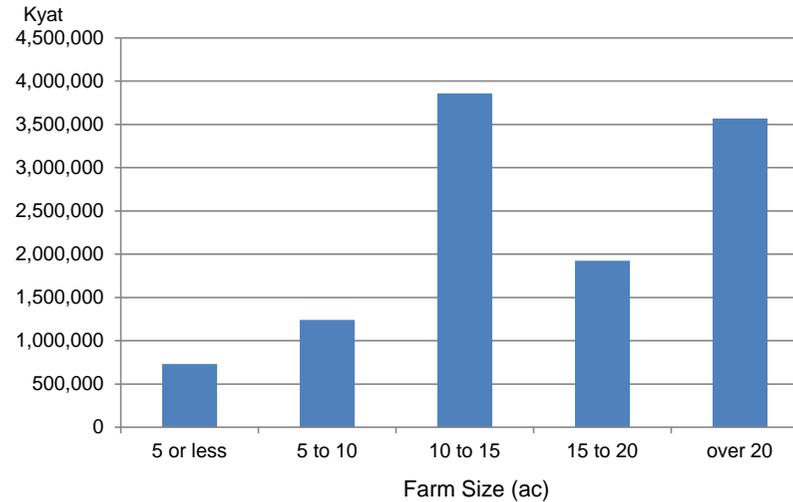
Where do you borrow urgent money? (n=447)



Where do you borrow urgent money? (n=447)

	No. of Farmers	%
MADB	18	4%
Private lenders	279	62%
Relatives	97	22%
Friends	53	12%
NGOs	0	0%
Others	0	0%
Total	447	100%

How much money do you borrow at one time? (Average by Farm Size)



Do you lend money? (n=468)

	No. of Farmers	%
Yes	34	7%
No	434	93%
Total	468	100%

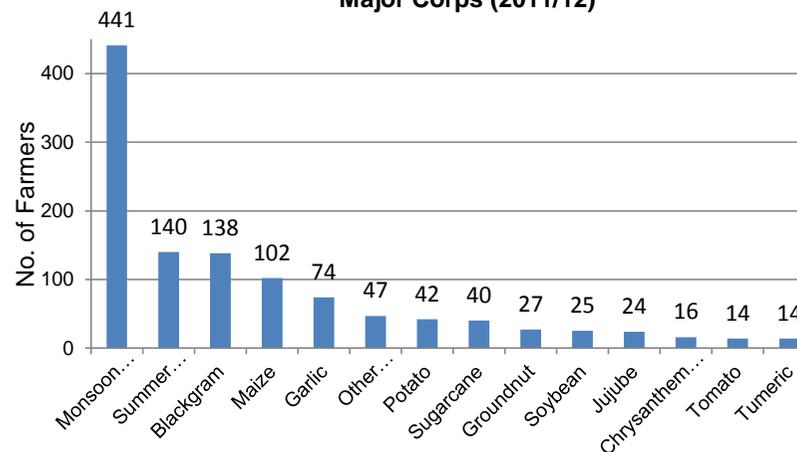
How much do you lend out? (n=34)

	Kyat
Average	577,941
Max	2,000,000
Minimum	50,000
Median	500,000
Mode	1,000,000

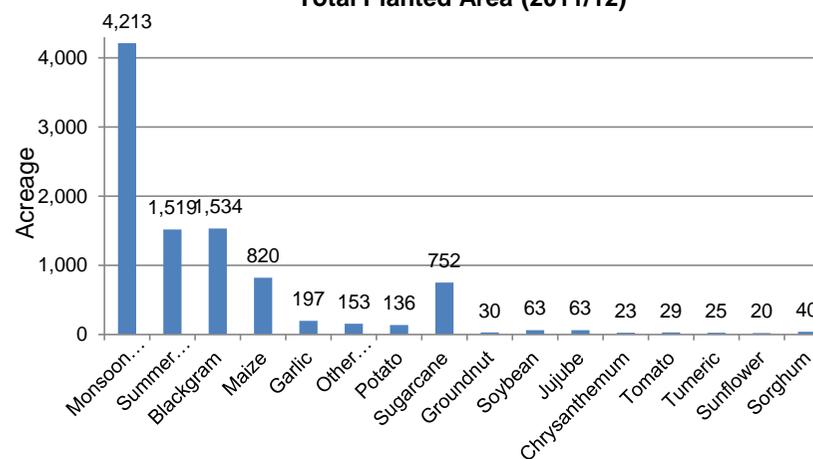
2. Agriculture
Major Crops (2011/12)

	No of Farmers	Planted Area (ac)	Ave Size (ac)
Monsoonrice	441	4,213	10
Summerpaddy	140	1,519	11
Blackgram	138	1,534	11
Maize	102	820	8
Garlic	74	197	3
Othervegetables	47	153	3
Potato	42	136	3
Sugarcane	40	752	19
Groundnut	27	30	1
Soybean	25	63	3
Jujube	24	63	3
Chrysanthemum	16	23	1
Tomato	14	29	2
Tumeric	14	25	2
Sunflower	7	20	3
Eggplant	7	6	1
Pigeonpea	6	18	3
Sorghum	5	40	8
Chickpea	5	22	4
Sesame	4	8	2
Onion	4	10	2
Carrot	3	3	1
Mango	3	9	3
GreenGram	2	7	4
Citrus	2	4	2
Chili	1	1	1
Cucumber	1	1	1
Water melon	0	0	-
Okra	0	0	-
Toddy	0	0	-
Dragonfruits	0	0	-
Other fruits	0	0	-

Major Corps (2011/12)



Total Planted Area (2011/12)



Livestock & Fisheries

	No of Farmers	Average	(Unit)
Cattle	210	4.7	head
Buffalo	36	2.6	head
Goat/sheep	2	20.0	head
Pig	101	3.0	head
Chicken	123	15.8	birds
Duck	43	12.0	birds
Fish Pond	5	9.3	ac

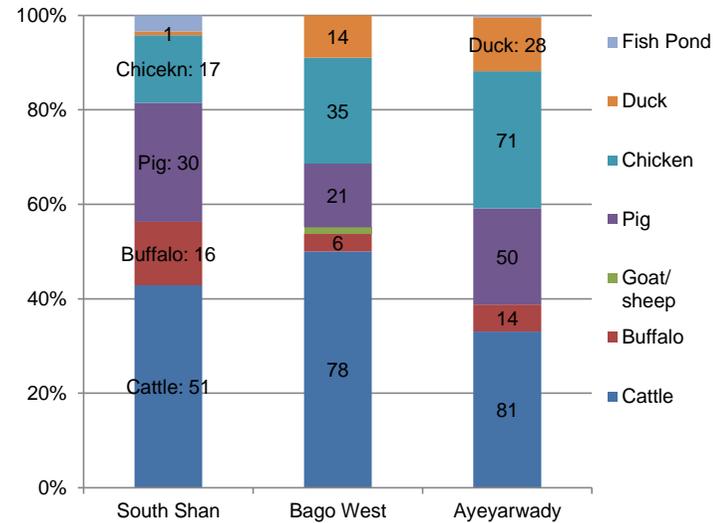
Livestock & Fisheries by Area (number of Farmers, multiple answers)

	South Shan	Bago West	Ayeyarwady	Total
Cattle	51	78	81	210
Buffalo	16	6	14	36
Goat/sheep	0	2	0	2
Pig	30	21	50	101
Chicken	17	35	71	123
Duck	1	14	28	43
Fish Pond	4	0	1	5
Total Sample	240	120	120	480

Livestock & Fisheries by Area

	South Shan	Bago West	Ayeyarwady	Total
	21%	65%	68%	44%
	7%	5%	12%	8%
	0%	2%	0%	0%
	13%	18%	42%	21%
	7%	29%	59%	26%
	0%	12%	23%	9%
	2%	0%	1%	1%
	100%	100%	100%	100%

Livestock & Fisheries by Area



Livestock & Fisheries by Farm Size (number of Farmers)

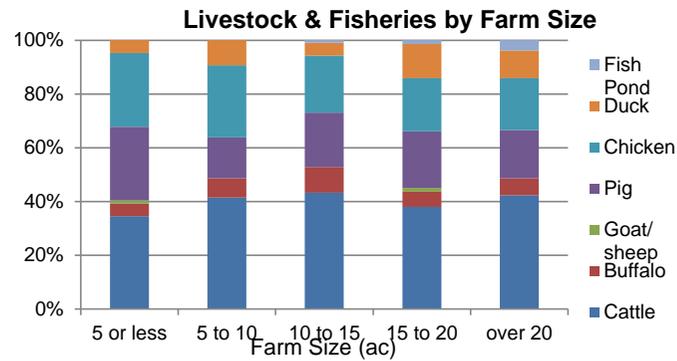
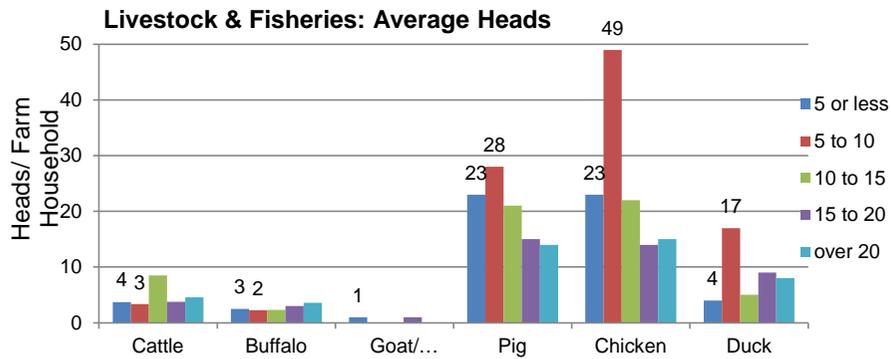
	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
	29	76	45	27	33	210
	4	13	10	4	5	36
Goat/sheep	1			1		2
Pig	23	28	21	15	14	101
Chicken	23	49	22	14	15	123
Duck	4	17	5	9	8	43
Fish Pond			1	1	3	5

Livestock & Fisheries by Farm Size (average heads)

	5 or less	5 to 10	10 to 15	15 to 20	over 20	(Unit)
	4	3	8	4	5	head
	3	2	2	3	4	head
	1			1		head
	23	28	21	15	14	head
	23	49	22	14	15	birds
	4	17	5	9	8	birds
			1	1	3	ac
	57	100	60	47	48	

Number of Farms who have Goat 5 an more

	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
	0	0	0	0	0	0
	1	0	0	1	0	2
	0	0	0	0	0	0



Is your farm land irrigated?

	No of Farmer	%
Yes	271	56%
No	209	44%
Total	480	100%

	South Shan	Bago West	Ayeyarwady	South Shan	Bago West	Ayeyarwady
Yes	151	87	33	63%	73%	28%
No	89	33	87	37%	28%	73%
Total	240	120	120	100%	100%	100%

Irrigated Farm land (Unit: ac)

	Paddy land	Up land	Total
Total Size	2,413	137	2,486
Average	9	6	10
Max	80	20	80
Minimum	1	1	1

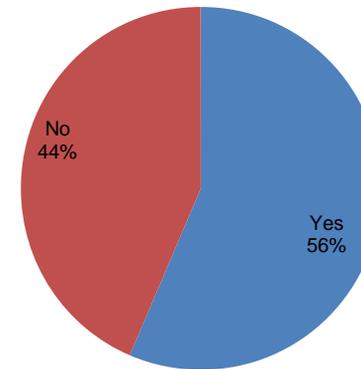
Irrigation Source

	No of Farmer	%
Canal	200	80%
Stream	41	16%
Tube	9	4%
Total	250	100%

Agricultural Practices (number of Farmers)

	Plowing	Harrowing	Weeding	Fertilizing	Harvesting
Cattle	98	115	-	-	-
2-wheel pwer tiller	360	346	-	-	-
4-wheel tractor	22	19	-	-	-
Hired labor	-	-	438	378	469
Family labor	-	-	24	102	11
Others	-	-	0	0	0
Total	480	480	462	480	480

Is your farm land irrigated? (n=480)



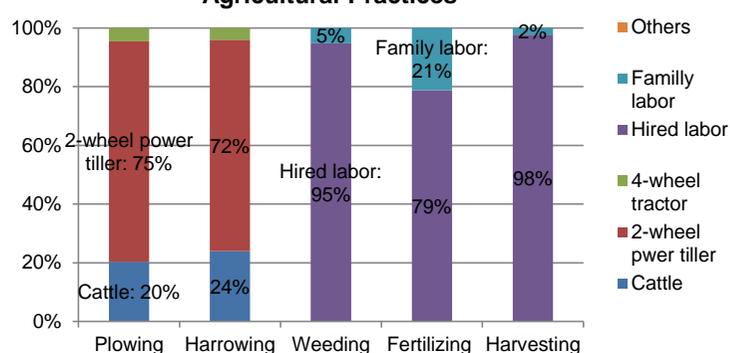
	Plowing	Harrowing	Weeding	Fertilizing	Harvesting
Cattle	20%	24%			
2-wheel pwer tiller	75%	72%			
4-wheel tractor	5%	4%			
Hired labor			95%	79%	98%
Familly labor			5%	21%	2%
Others			0%	0%	0%
Total	100%	100%	100%	100%	100%

Agricultural Machinery by Area (Unit: number of unit)

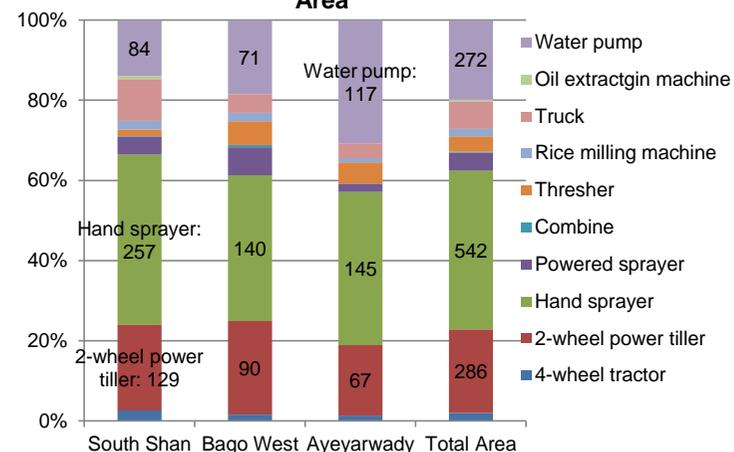
	South Shan	Bago West	Ayeyarwady	Total Area
4-wheel tractor	16	6	5	27
2-wheel power tiller	129	90	67	286
Hand sprayer	257	140	145	542
Powered sprayer	27	27	8	62
Combine	1	2	0	3
Thresher	10	23	20	53
Rice milling machine	13	8	4	25
Truck	63	18	14	95
Oil extractgin machine	5	0	0	5
Water pump	84	71	117	272
Total Sample	240	120	120	480

	South Shan	Bago West	Ayeyarwady	Total Area
4-wheel tractor	7%	5%	4%	6%
2-wheel power tiller	54%	75%	56%	60%
Hand sprayer	107%	117%	121%	113%
Powered sprayer	11%	23%	7%	13%
Combine	0%	2%	0%	1%
Thresher	4%	19%	17%	11%
Rice milling machine	5%	7%	3%	5%
Truck	26%	15%	12%	20%
Oil extractgin machine	2%	0%	0%	1%
Water pump	35%	59%	98%	57%
Total Sample	100%	100%	100%	100%

Agricultural Practices



Agricultural Machinery Distribution by Area



Agricultural Machinery by Farm Size (Unit: number of unit)

	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
4-wheel tractor	2		2		23	27
2-wheel power tiller	14	67	64	46	95	286
Hand sprayer	63	180	113	76	110	542
Powered sprayer	4	4	12	5	37	62
Combine			1		2	3
Thresher	1	2	9	9	32	53
Rice milling machine		6	3	5	11	25
Truck	4	22	18	11	40	95
Oil extractgin machine		1		1	3	5
Water pump	22	60	55	35	100	272
Total Sample	102	166	91	51	70	480

	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
4-wheel tractor	2%	0%	2%	0%	33%	37%
2-wheel power tiller	14%	40%	70%	90%	136%	60%
Hand sprayer	62%	108%	124%	149%	157%	113%
Powered sprayer	4%	2%	13%	10%	53%	13%
Combine	0%	0%	1%	0%	3%	1%
Thresher	1%	1%	10%	18%	46%	11%
Rice milling machine	0%	4%	3%	10%	16%	5%
Truck	4%	13%	20%	22%	57%	20%
Oil extractgin machine	0%	1%	0%	2%	4%	1%
Water pump	22%	36%	60%	69%	143%	57%
Total Sample	100%	100%	100%	100%	100%	100%

Do you lend out 4-wheel tractor?

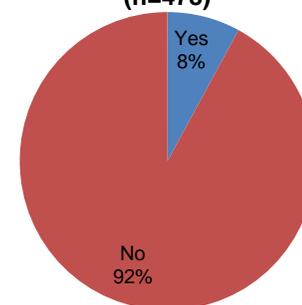
	No of Farmers	%
Yes	38	8%
No	440	92%
Total	478	100%

Do you ask plowing or harrowing?

	No of Farmers	%
Yes	269	57%
No	204	43%
Total	473	100%

Do you lend out 4-wheel tractor?

(n=478)



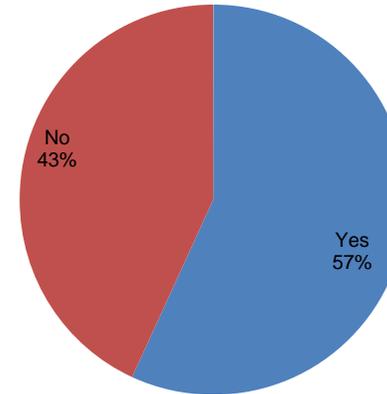
How much do you pay for plowing or harrowing?

	kyat/ac	kyat/hour
Average	18,465	7,091
Maxmium	63,000	45,000
Minimum	1	1
Median	15,000	4,000
Mode	10,000	3,500

Do you ask AMD to cultivate land?

	No of Farmers	%
Yes	0	0%
No	475	100%
Total	475	100%

Do you ask plowing or harrowing? (n=473)



4. Farm Economic

Production Cost (Unit: kyat/ac)

	Average	Maxmium	Minimum	Median	Mode	No. of Sample
Monsoonrice	189,244	400,000	85,000	170,000	150,000	442
Summerpaddy	185,866	450,000	80,000	170,000	150,000	142
Pigeonpea	60,400	100,000	12,000	60,000	100,000	5
Sesame	75,000	100,000	50,000	75,000	100,000	4
Groundnut	203,148	700,000	10,000	150,000	150,000	27
GreenGram	60,000	60,000	60,000	60,000	60,000	2
Maize	175,404	1,000,000	30,000	150,000	150,000	99
Sorghum	150,000	200,000	50,000	150,000	150,000	6
Chickpea	72,500	100,000	35,000	75,000	100,000	6
Sunflower	100,000	300,000	30,000	85,000	100,000	8
Soybean	87,400	300,000	20,000	70,000	50,000	25
Onion	333,333	700,000	100,000	275,000	-	6
Chili	20,000	20,000	20,000	20,000	-	1
Potato	734,884	2,200,000	200,000	550,000	700,000	43
Tomato	251,429	700,000	100,000	200,000	150,000	14
Cucumber	40,000	40,000	40,000	40,000	-	1
Water melon	-	-	-	-	-	0
Carrot	216,667	400,000	50,000	200,000	-	3
Okra	-	-	-	-	-	0
Eggplant	177,143	500,000	50,000	140,000	50,000	7
Othervegetables	414,286	1,000,000	12	500,000	500,000	49
Mango	225,000	350,000	100,000	225,000	-	2
Citrus	550,000	550,000	550,000	550,000	-	1
Toddy	-	-	-	-	-	0
Dragonfruits	-	-	-	-	-	0
Blackgram	89,106	500,000	5,000	80,000	80,000	141
Jujube	51,957	90,000	30,000	50,000	50,000	23
Other fruits	-	-	-	-	-	0
Garlic	448,235	850,000	100,000	425,000	400,000	68
Tumeric	188,462	300,000	100,000	150,000	100,000	13
Sugarcane	439,318	1,500,000	150,000	450,000	450,000	44
Chrysanthemum	1,873,333	6,000,000	200,000	1,200,000	500,000	15

Farm Gate Price (Unit: kyat/basket)

	Average	Maxmium	Minimum	Median	Mode	No. of Sample	Unit
Monsoonrice	5,005	42,000	500	4,500	5,000	443	kyat/basket
Summerpaddy	3,886	9,500	2,800	3,600	3,500	139	kyat/basket
Pigeonpea	680	800	400	700	700	5	kyat/basket/viss
Sesame	15,750	43,000	1,000	9,500	1,000	4	kyat/basket
Groundnut	8,645	20,000	1,500	8,000	6,000	22	kyat/basket
GreenGram	18,000	18,000	18,000	18,000	18,000	2	kyat/basket
Maize	352	2,000	25	350	350	97	kyat/basket/viss
Sorghum	324	475	250	300	300	6	kyat/basket
Chickpea	8,400	17,000	800	7,900	800	6	kyat/basket
Sunflower	1,150	3,500	300	950	1,000	8	kyat/basket/viss
Soybean	886	1,000	500	900	1,000	26	kyat/basket/viss
Onion	540	1,000	300	500	300	5	kyat/viss
Chili	3,500	3,500	3,500	3,500	-	1	kyat/viss
Potato	433	1,000	300	400	350	43	kyat/viss
Tomato	388	700	25	400	500	14	kyat/viss
Cucumber	50	50	50	50	-	1	kyat/viss
Water melon	-	-	-	-	-	0	kyat/viss
Carrot	350	700	100	250	-	3	kyat/viss
Okra	-	-	-	-	-	0	kyat/viss
	105	470	20	50	50	7	kyat/viss
	2,922	60,000	20	100	50	49	kyat/viss
	175	250	100	175	-	2	kyat/viss
	26	27	25	26	-	2	kyat/viss
	-	-	-	-	-	0	kyat/viss
	-	-	-	-	-	0	kyat/viss
	14,762	21,000	1,300	15,000	15,000	141	kyat/viss
	1,050	1,200	800	1,100	1,100	23	kyat/viss
	40,000	40,000	40,000	40,000	40,000	3	kyat/viss
	903	12,000	180	700	700	73	kyat/viss
	652	1,500	100	600	600	13	kyat/viss
	29,840	80,000	120	40,000	40,000	39	kyat/ton/viss
	47	80	25	50	50	15	kyat/plant

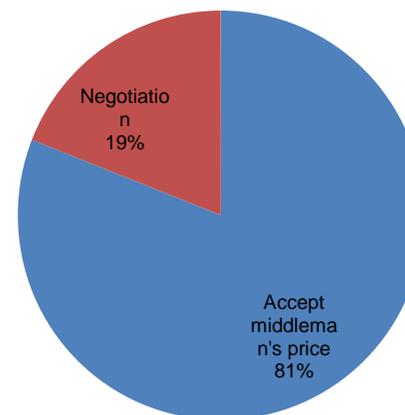
How do you decide your crop price?

	No of Farmer	%
Accept middleman's price	388	81%
Negotiation	91	19%
	0	0%
	479	100%

Where do you market your crop? (Unit: number of farmers)

	Local market	Yangon	Other regions	Total Answer
	434	2	5	441
	4	0	0	4
	96	0	0	96
	2	0	0	2
	19	0	1	20
	2	0	0	2
	4	0	3	7
	139	2	0	141
	6	0	0	6
Sunflower	8	0	0	8
Soybean	19	0	0	19
Cabbage	18	0	1	19
Tomato	14	0	0	14
Greentea	0	0	0	0
Okra	0	0	0	0
Eggplant	7	0	0	7
Other vegetables	26	1	1	28
Onion	5	0	0	5
Chili	1	0	0	1
Potato	35	0	2	37
Mango	1	0	0	1
Garlic	58	0	3	61
Tumeric	15	0	0	15
Sugarcane	58	0	1	59
Chaysnthemum	12	1	0	13

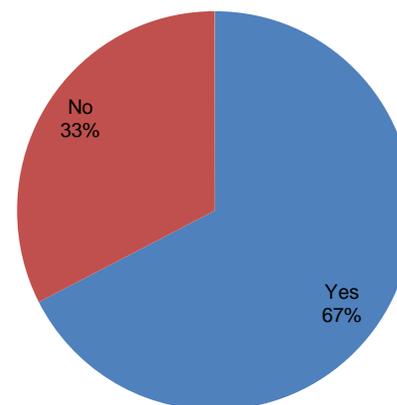
How do you decide your crop price? (n=479)



Buyers of Crops (Unit: number of farmers)

	Local middlema	from Yangon	From other regions	Total Answer
Rice	416	2	5	423
Pigeon pea	4	0	0	4
Maize	81	0	0	81
Sesame	2	0	0	2
Groundnut	21	0	1	22
GreenGram	0	0	0	0
Sorghum	4	0	3	7
Blackgram	139	2	0	141
Chickpea	6	0	0	6
Sunflower	6	0	0	6
Soybean	21	0	0	21
Cabbage	17	0	1	18
Tomato	13	0	0	13
Greentea	0	0	0	0
Okra	0	0	0	0
Eggplant	8	0	0	8
Other vegetables	25	0	1	26
Onion	5	0	0	5
Chili	1	0	0	1
Potato	42	0	2	44
Mango	4	0	0	4
Garlic	53	0	3	56
Tumeric	14	0	0	14
Sugarcane	37	0	1	38
Chrysanthemum	12	0	1	13

Did you have extension services by MADB or Others? (n=476)



Did you have extension services by MADB or Others?

	No of Farmer	%
Yes	321	67%
No	155	33%
Total	476	100%

What kind of extension services did you have over the last 3 years? (multiple answers)

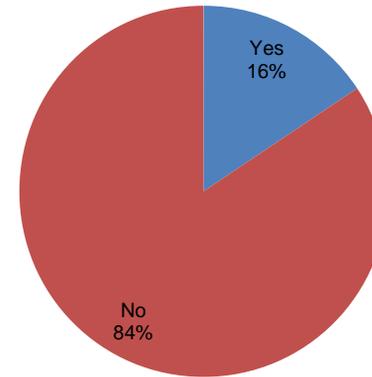
	No of Farmer	%	Frequency average (unit: times in last 3 years)	Frequency mode
Distribution of Mnnual	177	37%	6.2	3
Training	195	41%	6.0	3
Technical Advice	285	59%	5.8	3
Total Sample	480			

Did you have extension services on agricultural loan by NGOs or donors?

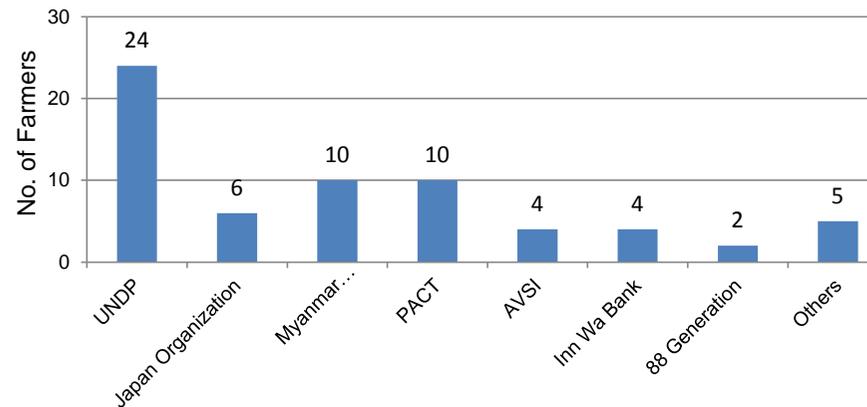
	No of Farmer	%
Yes	73	16%
No	393	84%
Total	466	100%

	No of Farmer	%
UNDP	24	37%
Japan Organization	6	9%
Myanmar Organizat	10	15%
PACT	10	15%
AVSI	4	6%
Inn Wa Bank	4	6%
88 Generation	2	3%
Others	5	8%
Total	65	100%

Did you have extension services by NGOs or Donors? (n=466)



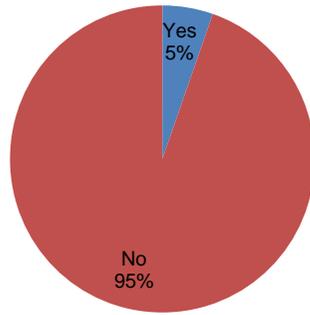
Which organizations did you provide extension services on agricultural loans?



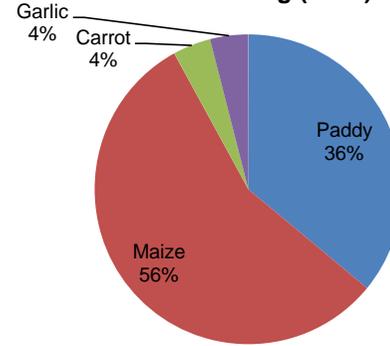
Do you cultivate for contract farming?

	No of Farmer	%
Yes	25	5%
No	440	95%
Total	465	100%

Do you cultivate for contract farming (n=465)



Which crop do you cultivate for contract farming (n=25)



Which crop do you cultivate for contract farming?

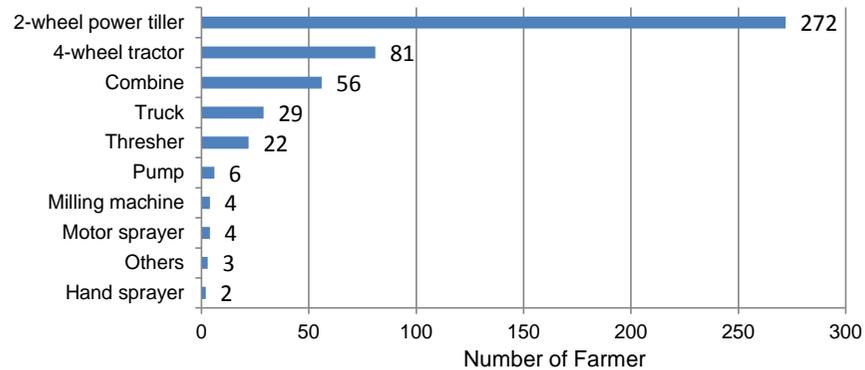
	No of Farmer	%
Paddy	9	36%
Maize	14	56%
Carrot	1	4%
Garlic	1	4%
Total	25	100%

	South Shan	Bago West	Ayeyarwady	Total
Paddy	1	1	7	9
Maize	14	0	0	14
Carrot	1	0	0	1
Garlic	1	0	0	1
Total	17	1	7	25
Total Sample	240	120	120	480
Ratio	7%	1%	6%	5%

What kind of Agricultural Machinery do you want?

	No of Farmer	%
Hand sprayer	2	0%
Others	3	1%
Motor sprayer	4	1%
Milling machine	4	1%
Pump	6	1%
Thresher	22	5%
Truck	29	6%
Combine	56	12%
4-wheel tractor	81	17%
2-wheel power tiller	272	57%
Total Sample	480	100%

What kind of agricultural machinery do you want?

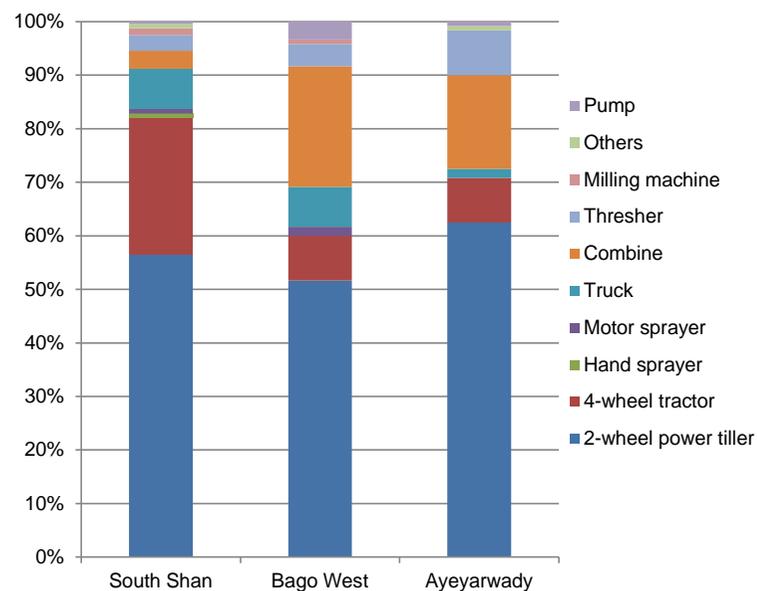


What kind of Agricultural Machinery do you want? (by Area, Unit: number of farmers)

	South Shan	Bago West	Ayeyarwady	Total
2-wheel power tiller	135	62	75	272
4-wheel tractor	61	10	10	81
Hand sprayer	2	0	0	2
Motor sprayer	2	2	0	4
Truck	18	9	2	29
Combine	8	27	21	56
Thresher	7	5	10	22
Milling machine	3	1	0	4
Others	2	0	1	3
Pump	1	4	1	6
Total	240	120	120	480

	South Shan	Bago West	Ayeyarwady	Total
2-wheel power tiller	56%	52%	63%	57%
4-wheel tractor	25%	8%	8%	17%
Hand sprayer	1%	0%	0%	0%
Motor sprayer	1%	2%	0%	1%
Truck	8%	8%	2%	6%
Combine	3%	23%	18%	12%
Thresher	3%	4%	8%	5%
Milling machine	1%	1%	0%	1%
Others	1%	0%	1%	1%
Pump	0%	3%	1%	1%
	100%	100%	100%	100%

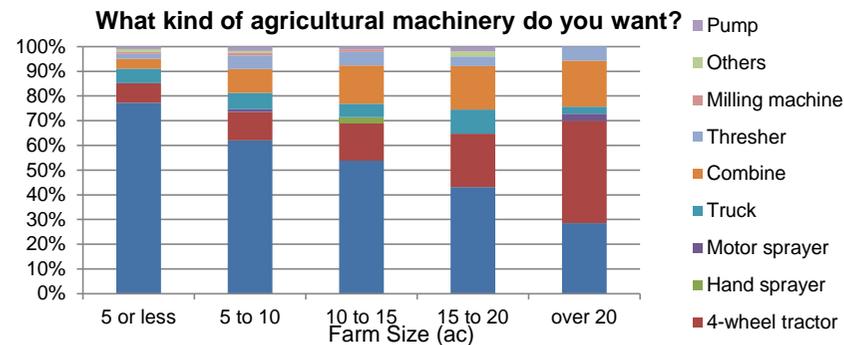
What kind of agricultural machinery do you want?



What kind of Agricultural Machinery do you want? (by Farm Size, Unit: number of farmers)

	5 or less	5 to 10	10 to 15	15 to 20	over 20	Total
2-wheel power tiller	78	103	49	22	20	272
4-wheel tractor	8	19	14	11	29	81
Hand sprayer	0	0	2	0	0	2
Motor sprayer	0	2	0	0	2	4
Truck	6	11	5	5	2	29
Combine	4	16	14	9	13	56
Thresher	2	9	5	2	4	22
Milling machine	1	2	1	0	0	4
Others	1	1	0	1	0	3
Pump	1	3	1	1	0	6
Total Sample	101	166	91	51	70	479

	5 or less	5 to 10	10 to 15	15 to 20	over 20
2-wheel power tiller	77%	62%	54%	43%	29%
4-wheel tractor	8%	11%	15%	22%	41%
Hand sprayer	0%	0%	2%	0%	0%
Motor sprayer	0%	1%	0%	0%	3%
Truck	6%	7%	5%	10%	3%
Combine	4%	10%	15%	18%	19%
Thresher	2%	5%	5%	4%	6%
Milling machine	1%	1%	1%	0%	0%
Others	1%	1%	0%	2%	0%
Pump	1%	2%	1%	2%	0%
Total Sample	100%	100%	100%	100%	100%



Do you have a plan for agri-related business?

	No of Farmer	%
Yes	196	41%
No	282	59%
Total	478	100%

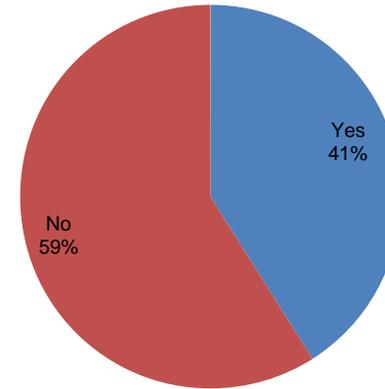
Do you have a plan for agri-related business? (By farm size)

	5 or less	5 to 10	10 to 15	15 to 20	over 20
Yes	42	69	39	20	26
No	60	96	52	31	43
Total	102	165	91	51	69
Ratio of Yes	41%	42%	43%	39%	38%

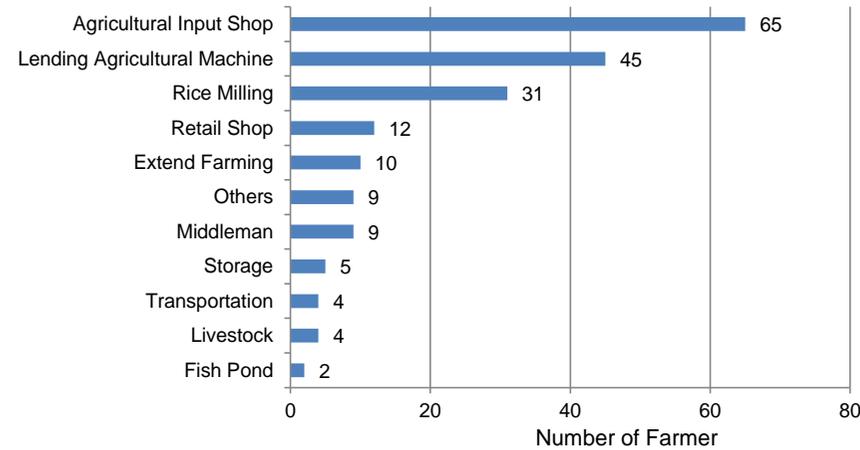
What kind of business plan do you have?

	No of Farmer	%
Fish Pond	2	1%
Livestock	4	2%
Transportation	4	2%
Storage	5	3%
Middleman	9	5%
Others	9	5%
Extend Farming	10	5%
Retail Shop	12	6%
Rice Milling	31	16%
Lending Agricultural Machine	45	23%
Agricultural Input Shop	65	33%
Total	196	100%

Do you have a plan for agri-related business? (n=478)



What type of business do you plan? (n=196)



Which do you want to use for agricultural machinery?

	No of Farmer	%
MADB	217	46%
GTB	3	1%
Private lenders	256	54%
Others	0	0%
Total	476	100%

Which do you want to use for agri-business?

	No of Farmer	%
MADB	154	42%
GTB	3	1%
Private lenders	207	57%
Others	0	0%
Total	364	100%

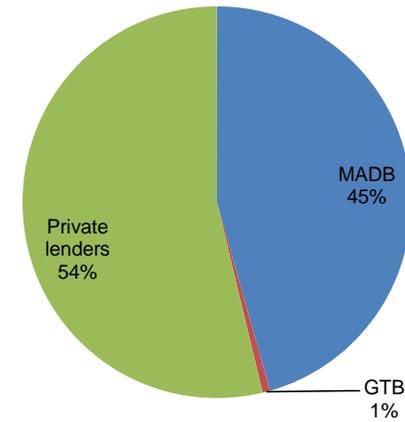
Main Issues for Borrowing from MADB and GTB

	No of Farmer	%
Total	309	100%
Long time to get money	166	54%
Many Steps	72	23%
Others	38	12%
Not enough amount	33	11%

What is your main issue for extending farming scale?

	No of Farmer	%
Weather	2	0%
Others	4	1%
Agricultural Technique	9	2%
Land price	18	4%
Marketing/crop price	23	5%
Water source	30	6%
Input cost	46	10%
Lack of machinery & equipment	97	21%
Labour cost	110	24%
Lack of money	124	27%
Total	463	100%

Which moeny lender do you want use for agricultural machinery? (n=476)



What is main issue of borrlowing from MADB? (n=309)

