# THEMATIC PAPERS ON

# MYANMAR CENSUS OF AGRICULTURE 2010

May 2013

The Republic of the Union of Myanmar
Ministry of Agriculture and Irrigation
Settlement and Land Records Department

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# MYANMAR CENSUS OF AGRICULTURE 2010

TCP/MYA/3301 (D)

Editor: Jairo G. Castano

May 2013

# Foreword

The Myanmar Census of Agriculture 2010 was initiated in 2008. Preliminary implementation and enumeration of the Core Module was conducted from February to March 2009 while the enumeration of the Supplementary (sampling) Module, involving five types of household questionnaires, was carried out from February to March, 2011 under the FAO's Technical Cooperation Program of TCP/MYA/3301 (D) in conformity with the guidelines of FAO's World Census of Agriculture 2010 (WCA 2010).

The Census survey covered (17) Regions and States, (66) Districts, (351) Townships and Sub-townships, (12,375) Village-tracts, (1,917) Blocks, (53,530) Villages and (2,496) Sub-blocks throughout the country. The total agricultural census questionnaires of about (1.57) million were used for (0.56) million of total holdings in Regions and States.

Based on the results of processing and analyzing the census surveyed data, eight thematic papers were prepared by resource persons from relevant departments and organization. The thematic papers were: (1) Overview of food accessibility situation in Myanmar (2) Distribution of agricultural lands under paddy in different regions (3) Land utilization, land types and land tenure in Myanmar (4) Sustainable irrigation development and the increase of area under irrigation (5) Improving rural farmers' economy: combining the raising of cattle/other livestock with crop cultivation (6) Aquaculture: a potential major economic activity in Myanmar (7) Multi-economic activities of agricultural households in Myanmar and (8) Gender profile of Myanmar's agricultural households.

The thematic papers have the purpose of analyzing the current situation of the agricultural sector and any trends or changes from the 2003 census of agriculture. The papers were presented at the "National Dissemination Seminar on Myanmar Census of Agriculture 2010 and Presentation of Thematic Paper" jointly organized by SLRD and FAO in Nay Pyi Taw from 5 to 6 November, 2012. The papers were revised based on comments and suggestions received in seminar. They also benefited from comments of the Chairman of the Project Steering Committee, Project Lead Consultant and Senior Statistician of FAO.

This publication was prepared with the assistance of FAO for the benefit of all data users, and therefore, it is believed that the thematic papers will be able to satisfy the needs of relevant sectors, departments, and organizations.

Deservingly, my appreciation should go to the authors of thematic papers and my gratitude should extend to FAO for providing the technical assistance and financial aid that contributed to the completion of MCA 2010, all staffs and concerned departments of MoAI, Ministry of Livestock and Fisheries, Ministry of National Planning and Economic Development, Ministry of Environmental Conservation and Forestry, Department of Population as well as all consultants and those who contributed in one way or another for the successful implementation of Myanmar Census of Agriculture 2010.

**U MYINT SWE**
Director-General, SLRD
Chairman of the Steering Committee

H. E U Myint Hlaing, Minister for Ministry of Agriculture and Irrigation, Ms. Bui Thi Lan, FAO Representative in Myanmar, Deputy Ministers and Director-Generals from Concerned Ministries of the Republic of the Union of Myanmar, and International Experts and Responsible Persons of the TCP/MYA/3301(D)

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# Overview of Food Accessibility Situation in Myanmar

Zaw Aye Moe

## Abstract

The terms food security and insecurity are used to describe whether or not people have access to a sufficient quantity of food that is of good quality. Cereals, oilseed crops and pulses play a dominant role in the country's food security and in its food economy. The main consumption pattern of the hilly region can be described as rice-vegetables-root crops whereas in the delta region it is rice-vegetables-fish, in the dry zone it is rice-vegetables-fish-pulses and in the coastal region it is rice-vegetables-fish-nuts. Although rice is accessed by most of the households through their own production in all regions, about 66 percent and 55 percent of the households in the dry zone and hilly region respectively buy rice from other regions or states as they produce an insufficient amount for their daily consumption. The majority of the households in the hilly (77 percent), delta (62 percent), dry zone (75 percent) and coastal areas (54 percent) reported that the major constraint on accessing basic food items was low productivity because of shortage of capital and insufficient land area. The most common ways of overcoming food inaccessibility in all regions were to send some household members to look for other sources of income including rural and urban migration, the sale of physical assets and borrowing food and/or money from others. Employment opportunities in both agriculture and non-agriculture sectors should be created as they are very important for allocating surplus rural labour and increasing household incomes to ensure sufficient food consumption. As agriculture plays an important role in food security on the macro and household levels, public investment in agriculture should take the form of making improvements in the agricultural infrastructure and introducing appropriate technologies to increase productivity for ensuring food accessibility in the future.

**Keywords: Food security, crop production, food accessibility**

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## List of Abbreviations

| | |
|---|---|
| **ADB** | Asian Development Bank |
| **ASEAN** | Association of South East Asian Nations |
| **CSO** | Central Statistical Organization |
| **DOA** | Department of Agriculture |
| **FAO** | Food and Agriculture Organization |
| **GDP** | Gross Domestic Product |
| **HYV** | High Yielding Variety |
| **IHLCA** | Integrated Household Living Conditions Assessment |
| **MCA** | Myanmar Census of Agriculture |
| **MNPED** | Ministry of National Planning and Economic Development |
| **RoUM** | The Republic of the Union of Myanmar |
| **SLRD** | Settlement and Land Records Department |
| **UNDP** | United Nations Development Programme |
| **WFP** | World Food Programme |
| **WFS** | World Food Summit |

# Overview of food accessibility situation in Myanmar[1]

Zaw Aye Moe[2]

## 1. Concepts and definitions of food security

Food security and insecurity are terms used to describe whether or not people have access to sufficient and quantity of food that is of good quality. Food security is affected by factors such as poverty, health, food production, political stability, infrastructure, access to markets, and natural hazards. In the past decades, food security has been viewed as food availability and national food self-sufficiency. Cabanilla (2006) and Briones (2010) have argued that self-sufficiency does not imply food security and that food security should be measured in terms of income as poverty causes food insecurity.

According to the 1996 World Food Summit by the Food and Agriculture Organization (FAO), ***food*** *is defined as any substance that people eat and drink to maintain life and growth* and *a person, household or community, region or nation is* ***food secure*** *when all members at all times have physical and economic access to buy, produce, obtain or consume sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life.* This definition identifies the key concept of food security in terms of four dimensions: food availability, food accessibility, food stability and food utilization. ***Food availability*** in a country, region or local area means that food is physically present because it has been grown, manufactured, imported and/or transported there. ***Food accessibility*** refers to the ways different people can obtain the available food. Normally we access food through a combination of home production, stocks, purchase, barter, gifts, borrowing or food aid. ***Food stability*** is particularly linked with vulnerability and risk factors that can negatively impact food availability or access to food. It requires that food is available to individuals and households at all times, so they have constant access to the food they require. ***Food utilization*** is the way people use the food and is dependent on the quantity and quality of the food, its preparation and storage method, nutritional knowledge, as well as on the health status of the individual consuming the food.

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[1] This paper was presented in the National Data Dissemination Seminar on Myanmar Census of Agriculture 2010 in Myat Taw Win Hotel, Nay Pyi Taw, on 5-6 November 2012.

[2] U Zaw Aye Moe is the Staff Officer of the Settlement and Land Records Department of the Ministry of Agriculture and Irrigation.

## 2. Performance of food security and food production in Myanmar

Improved food security is important for reducing hunger and poverty and for economic development, and hunger is a major constraint on a country's immediate and long-term economic, social and political development. Losses in labour productivity resulting from hunger can cause a 6 to 10 percent reduction in per capita gross domestic product (Sánchez 2005). Higher agricultural production can improve food security by decreasing food prices for consumers, increasing rural incomes and contributing to economic development. Studies show that a 1 percent rise in per capita agricultural output led to a 1.6 percent rise in incomes of the poorest 20 percent of people (Gallup *et al*. 1998).

The Union of Myanmar is an agricultural country with an estimated population of about 59.13 million in 2010 and an average growth rate of 1.29 percent per year. Actively growing populations have always desired reliable food supplies, but history reveals many periods and places in which food supplies have become unreliable or barely adequate. The government of Myanmar recognizes that ensuring food security greatly relies on the agricultural sector because it not only produces the bulk of the country's food but it also provides a large share of the country's gross domestic product (GDP). Hence, agricultural development and food security have always been part of the government's policies. However, increased agricultural production is vital, but not sufficient, for poverty reduction and economic development. No developing country has successfully reduced poverty through agriculture alone (institutional and industrial development are often needed), but almost none have achieved it without first increasing agricultural productivity.

Cereals, oilseed crops and pulses play a dominant role in Myanmar's food economy. Rice, which constitutes more than half of the total sown acreage, is grown in different climatic conditions and various topographical regions of the country. The Union of Myanmar is self-sufficient in rice at the national level. Among cereal crops, rice is the major crop and continuous efforts are being made not only to meet the amount required for domestic consumption but also for export purposes. Food security in Myanmar is synonymous with rice security because of its importance in the daily diet as a major source of energy intake.

The official data from the Department of Agriculture (DOA) reveals that paddy (unhusked rice) utilization (which includes for foods, seeds and waste) has decreased from about 65.65 percent of the total production in 2005/2006 to 60.27 percent in

2010/2011. Nevertheless, paddy production reached 32.59 million metric tons in 2010/2011 compared with 27.69 million metric tons in 2005/2006. Thus, paddy production and surplus have significantly increased since 2005/2006 and the paddy self-sufficiency ratio has increased from 152 percent in 2005/2006 to 166 percent in 2010/2011 (CSO 2011). Pulses are the third most important crop in Myanmar. Because of the large surplus, over one million metric tons of pulses are exported annually. The share of agricultural GDP (which includes crops, livestock, fishery and forestry) declined from 46.7 percent in 2005 to 39.9 percent in 2009 at 2005 constant producers' prices (MNPED 2009). Based on the ADB key indicators for Asia and the Pacific (2010), it is noted that the share of agricultural GDP (44 percent) of Myanmar was the highest among the ASEAN countries after Lao PDR and Cambodia in 2008.

According to the Integrated Household Living Conditions Assessment (IHLCA), the Union of Myanmar has reduced country food insecurity by about 5 percent annually since 2005. The nationwide IHLCA survey was conducted by the Ministry of National Planning and Economic Development (MNPEC) and the United Nations Development Programme (UNDP) in 2005 and 2010, respectively.

The most recent IHLCA survey in 2010 revealed that national food poverty declined from 10 percent in 2005 to 4.8 percent in 2010 when rural and urban food poverty fell from 11 percent to 5.6 percent and 6 percent to 2.5 percent, respectively and the Union of Myanmar is generally food secure at the national level and the country has the potential for helping to fill the gaps in food deficit countries in Asia. Nevertheless, recent food security assessment surveys and integrated household living conditions assessment surveys conducted by various agencies and organizations have concluded that many poor people in rural and urban areas still face the threat of food insecurity. Although a food surplus exists and the growth trend in most of the main food items is satisfactory, access to food remains a huge challenge in some parts of Myanmar, especially in remote, hilly regions and drought-prone areas. The IHLCA surveys 2005 and 2010 indicated that Chin, Shan (East and North), Kachin, Kayah and Rakhine suffered from a relatively high incidence of food poverty, with limited access to productive assets. According to WFP studies in 2009 and 2010, access to food was the main factor behind food insecurity in Chin, Kachin, Shan (North), Northern Rakhine and Magway regions. Until recently, Myanmar had very limited data on poverty and food insecurity. Many organizations and institutions have recommended that more in-depth surveys are needed to understand the true nature of income and non-income poverty and food insecurity in the country.

Myanmar Census of Agriculture in 2003 (MAC 2003) was conducted by the Settlement and Land Records Department (SLRD) under the Ministry of Agriculture and Irrigation and with the support from FAO. MCA 2003 covered all villages except for highly urbanized areas and gathered data on the demography of farm households, farm holdings and agricultural practices for different crops, input utilization and resources for farming, livestock and fishing activities and the utilization of hired labour. In MCA 2010, SLRD with the support of FAO distributed a new supplementary questionnaire in order to provide selected food security information for data users and decision-makers for the effective implementation of a food security assessment survey regionally. MCA 2010 mainly emphasized information on food accessibility rather than food supply.

Based on the similarity of agricultural patterns and practices, seventeen states and regions can be divided into four agro-ecological zones, namely: the mountainous/hilly zone consisting of Kachin, Kayah, Chin, Shan (South), Shan (North) and Shan (East); the delta and flat plains zone consisting of Ayeyarwady, Yangon, Bago East and Bago West, Kayin and Mon; the central dry zone region consisting of Mandalay, Sagaing and Magway and the coastal zone consisting of Tanintharyi and Rakhine.

The general objective of this paper is to provide the basic information on food availability and accessibility for food security monitoring and analysis, and the specific objectives are to provide data and information on consumption patterns, availability and accessibility of selected basic food items, problems and constraints related to food accessibility, coping strategies for accessing food, perceptions on food inaccessibility in the coming future and coping strategies for accessing food.

## 3. Food consumption patterns in Myanmar

Nearly 75 percent of total households are rural households engaged in subsistence farming activities. They grow cereals such as rice, wheat and corn for household consumption. Vegetables are produced from backyard gardens or edible leaves and shoots can be easily accessed from nearby farms. However, farmers cannot produce fish from their rice farms because they use large quantities of chemical fertilizers and pesticides.

The MCA 2010 reveals the daily basic food consumption pattern of the country. As rice is the staple food crop, 99 percent out of a total 5,414,557 households eat it as their main daily food and it provides 71 percent of their daily calorie intake; each person

eats on average more than 180 kilograms per year (Singleton *et al*. 2011). Vegetables (66.4 percent) and fish and sea food (28.4 percent) stand as the second and third most important food items in household daily food consumption. About 12 percent and 9 percent of total households reported that they consumed pulses and root crops respectively, which are the cheapest sources of protein, fibre and vitamins. However, the number of households eating fruits, edible nuts and meat in their daily diet was very low compared to those eating cereals, vegetables and fish (Figure 1.1). Therefore, the major consumption pattern of Myanmar is composed of rice, vegetables and fish.

However, sources of animal and plant protein are consumed only weekly or monthly and fruits and edible nuts are seldom consumed by households (Figure 1.2).

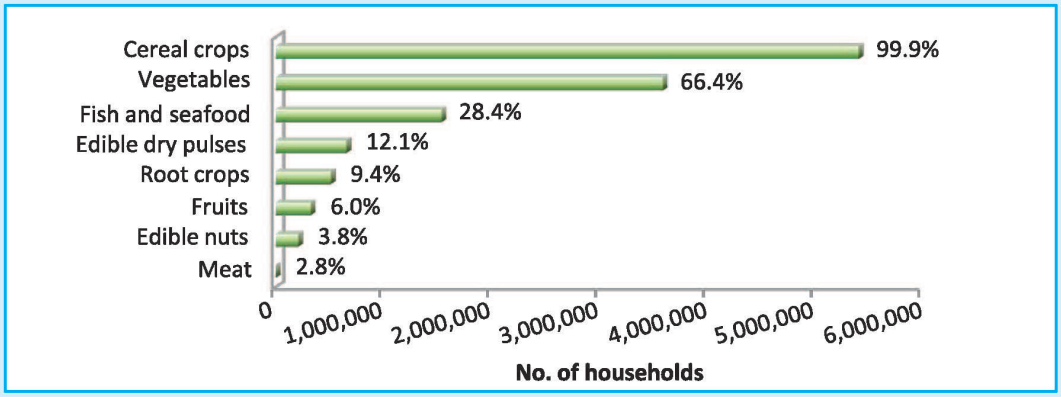


**Figure 1.1: Daily consumption on basic food items by respondents' households during the past 12 months in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

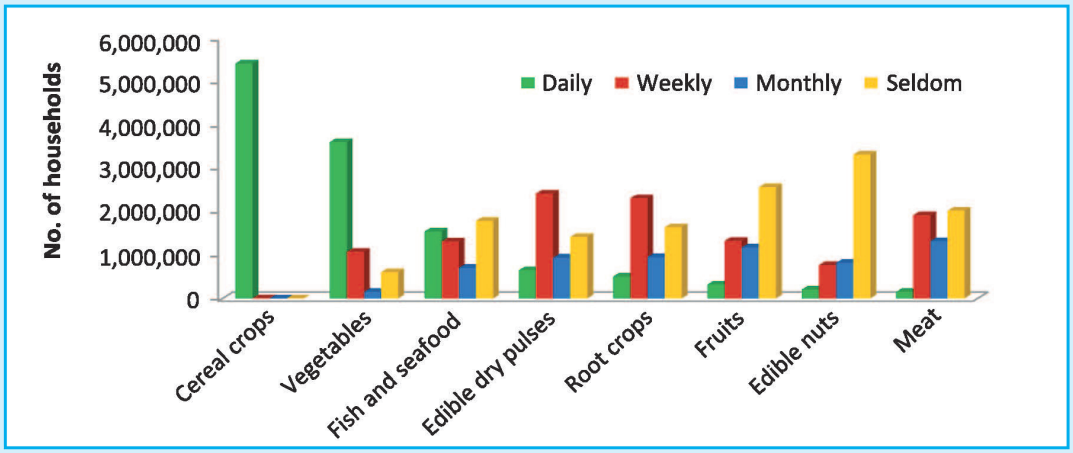


**Figure 1.2: Consumption patterns on selected basic food items by repondents' households during the past 12 month in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

### 3.1 Daily consumption patterns by different geographical zones

Specifically, the consumption pattern of the people of Myanmar differs on the basis of food accessibility and availability within the regions. Accordingly, their eating habits are changing. As Myanmar has diverse agro-ecological zones, the types of crops, cropping systems and patterns vary depending on the different climatic conditions. Apart from cereal crops, the composition of other food crops in their daily consumption patterns is different in each of the four zones (Figure 1.3). The main consumption pattern of the hilly region is rice-vegetables-pulses-root crops whereas that of the delta and flat plains regions is rice-vegetables-fish, that of the dry zone is rice-vegetables-fish-pulses and that of the coastal region is rice-vegetables-fish-nuts.

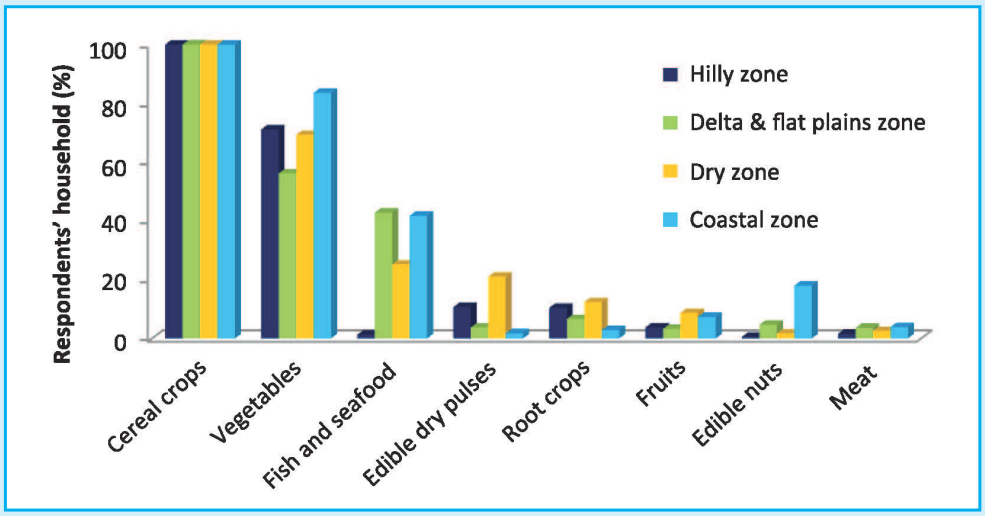


**Figure 1.3: Differences on daily consumption patterns among four ecological zones in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

## 4. Food accessibility and the different sources of food in Myanmar

About 5.4 million land holdings in the Union reported on food accessibility. Of this number, male-headed and female-headed households were found to comprise about 85 percent and 15 percent respectively. According to the responses of agricultural land holdings, food accessibility differs depending on the food availability of the home region. There are four main ways people gain access to food, namely own production, receiving it from relatives, buying it from others, and other sources. Of the total number of respondents' households (5,418,983), nearly all reported that they bought all kinds of basic food and 76 percent produced their own basic foods. Only 19 percent and 10

percent of total households received food from relatives and other sources respectively. Therefore, own production and buying from the others are the major sources of food in Myanmar (Appendix 1).

In terms of cereal crops, especially rice production, coastal and delta flat plains regions have higher levels of own production compared to the hilly region. As low rainfall with higher day temperatures reaching 39° to 43° C are common in the summer season, the dry zone has the lowest level of rice production (Myint 2009; MCA 2010). Because of the temperate climate, a higher percentage of households in the hilly region can produce more vegetables from their own farms than those in the other three regions. Households residing in delta and dry zones have the lowest levels of production of vegetables. In contrast, they have higher levels of production of meat and fish than the hilly zone households. Similarly, coastal regions have higher levels of fish and seafood production as most of the households are living along the river. In terms of pulse production, dry zone farmers have the highest potential food supply compared to coastal famers, whereas the farmers in the other two zones have similar levels of production (Figure 1.4 and Appendix 2).

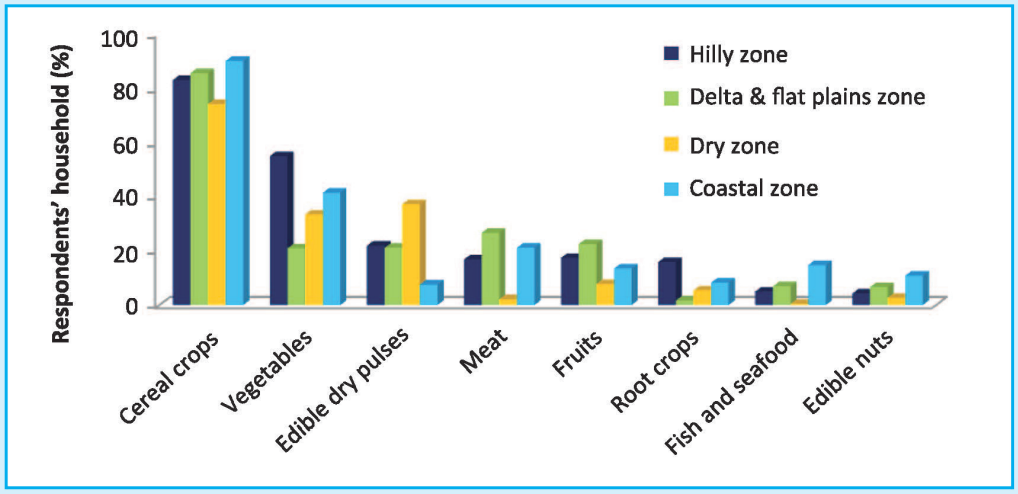


**Figure 1.4: Percentage of households who accessed the different food crops by own production in four diverse geographical zones in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

Although rice is accessed by most of the households through their own production in all regions, about 66 percent and 55 percent of the households in the dry zone and hilly region respectively have bought from other regions or states because of the insufficiency of their own production for their daily consumption. In general, delta and

flat plains and coastal areas are secure in cereal (rice) production and only 33 percent of total households have bought rice in both regions. Livestock production and meat consumption are very low in Myanmar compared to other ASEAN countries. No zone has sufficient meat for consumption from its own production. Above 95 percent of all of the households in all regions have to buy meat from the market. As most of the farmers in delta areas are rice farmers, about 92 percent of them buy vegetables from other places or from their relatives for their daily consumption. Similarly, the majority of farmers in the dry zone grow pulses and oil seed crops and about 89 percent of total households have to buy their vegetables from the market. However, most of the households in hilly regions consume vegetables from their own farm; about 72 percent of them have to buy vegetables from nearby markets (Figure 1.5 and Appendix 3).

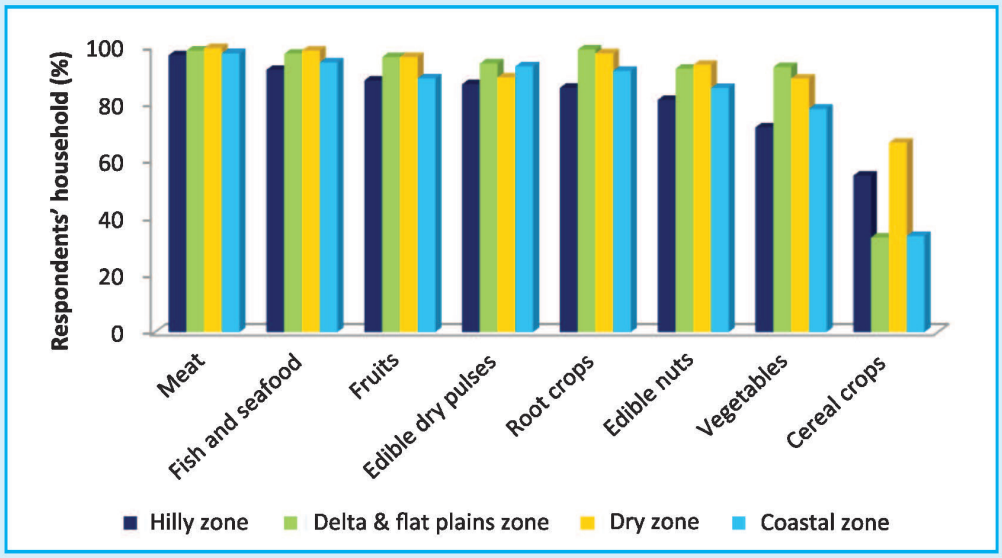


**Figure 1.5: Percentage of households who accessed the different food crops from buying in four diverse geographical zones in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

## 5. Constraints on and challenges to food accessibility

The majority of the households in the hilly (77 percent), delta (62 percent), dry zone (75 percent) and coastal areas (54 percent) reported that the major constraint on accessing basic food items was low productivity because of the shortage of capital and insufficient land area. About 50 percent of the households in each zone, except the households in the delta zone, revealed that the second major constraint on food accessibility was the high price of food. Therefore they could not afford to eat more frequently. Crop losses as a result of natural hazards and pest attacks was the third

major constraint on food accessibility of hilly, delta and coastal households as they were affected by floods, cyclones and sea level rises, which were common problems in these areas. Although the delta households' second major constraint was the unavailability of food in the market all the time, the households in the other zones considered such restrictions as their fourth or fifth constraint. Limited food budget because of losing a non-agricultural job was the fourth major constraint of every household in the four zones. Low production because of illness or disability of the holder was the fifth major concern of all households. Only 1 or 2 percent of total households stated their belief that it was unhealthy to eat more often (Figure 1.6).

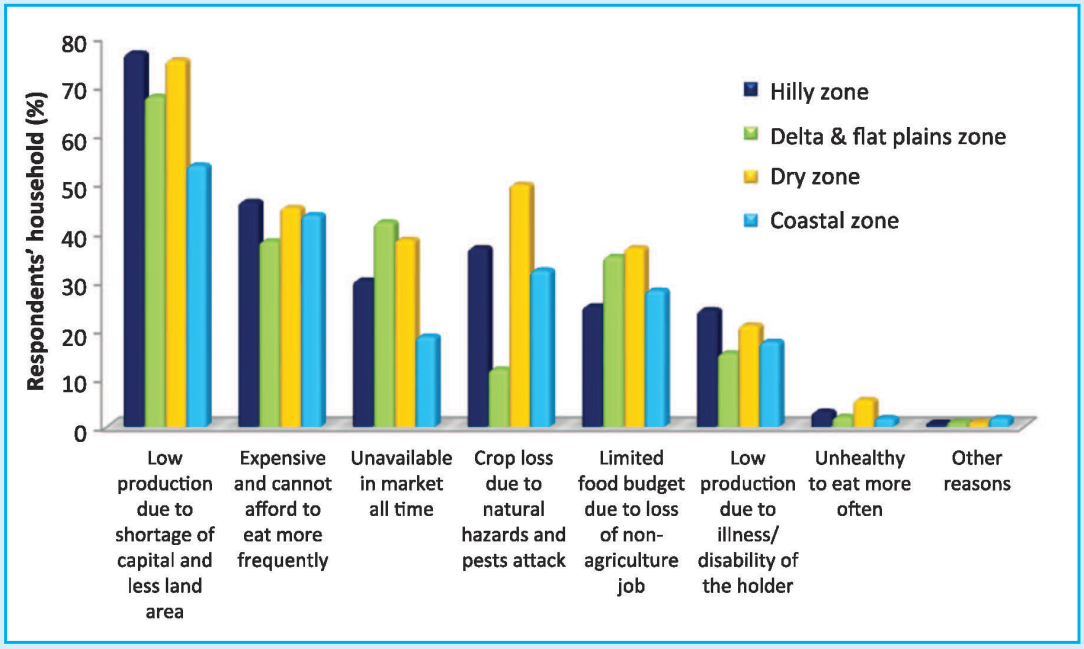


**Figure 1.6: Difficulties in accessing basic food items by respondent' households during the past 12 months by zones in RoUM: 2010**

Source: Myanmar Census of Agriculture (2010)

## 6. Steps taken for solving food inaccessibility

Based on the census results, it was reported that the most common solutions to food inaccessibility in all regions/states were sending some household members to look for other sources of income (including rural and urban migration), selling their physical assets and borrowing food and/or money from others. It should be noted that hilly and coastal areas still have thick forest cover unlike dry zone and delta flat plains. Households in hilly and coastal zones gathered and stored foods from forests to smooth out of consumption and they sold forest products for cash to buy food (Figure 1.7). Thus,

hilly and coastal zones should be assisted to improve food security in order to prevent the depletion of natural resources from existing forests.

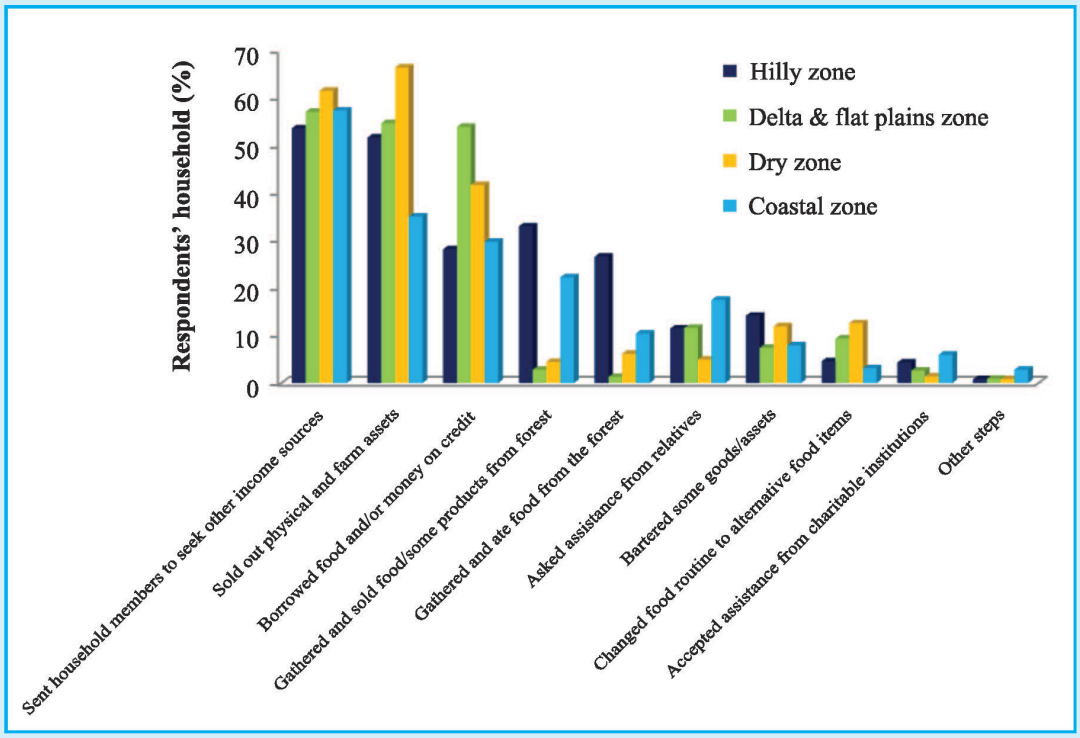


**Figure 1.7: Steps taken for solving food inaccessibility by respondents' household during the past 12 months by zones in RoUM: 2010**

Source: Myanmar Census of Agriculture (2010)

## 7. Perceptions on future food accessibility

The perceptions of the households with respect to their future food accessibility varied according to the constraints they faced. Those that were faced with low crop productivity because of lack of investment, insufficient land areas to grow crops, natural hazards and the impact of climate change as major constraints perceived an uncertain future, uncertainty in crop yields and lack of a stable income to buy enough food. Specifically, most of the households (57 to 69 percent) in the hilly zone stated that their future food accessibility was mainly dependent on uncertain future events and uncertain crop yields. Similarly, the households (61 to 64 percent) in the dry zones expressed that their food accessibility in the future might decrease as a result of having an uncertain income to buy enough foods and an uncertain future. In coastal areas, about 57 percent, 53 percent and 52 percent of the households responded that future food accessibility will depend on an uncertain future, unstable income and higher food prices that will prevent

them from buying basic food, respectively. In dry zone areas, 70 percent, 57 percent and 55 percent of the households revealed similar perceptions as coastal households (Figure 1.8).

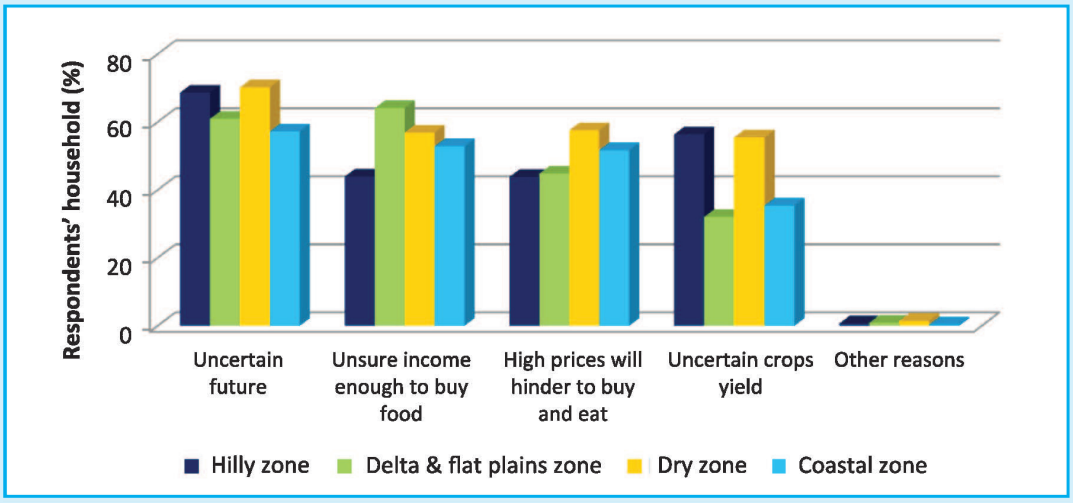


**Figure 1.8: Perception on food inaccessibility in coming future by respondents' households by zones in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

## 8. Coping strategies or steps to be taken to ensure future food accessibility

The responses of households in different geographical zones in MCA 2010 show that their willingness to access food in the future and their approaches to future food security were generally similar. As they commonly perceived that the uncertainty of future food production and crop failure would be challenges, nearly 75 percent of households in each zone wanted to diversify their incomes by finding other jobs or businesses aside from crop farming and/or keeping/breeding livestock or poultry. About 65 percent of the respondents wanted to change their local traditional varieties with high yielding varieties (HYVs) because they believed that their future food availability was mainly dependent on ensuring sufficient crop production. A higher percentage of households in the delta (64 percent) and coastal (62 percent) zones wanted to start or increase efforts in keeping or breeding of livestock and poultry to increase their own production for meat. In dry zone areas, seasonal or permanent migration was higher than in other areas and there was limited productive labour in their farm activities. Therefore, a greater of proportion of households (40 percent) in the dry zone area than in other areas (20 percent) wanted to train or guide household members in helping or operating the agricultural holding (Figure 1.9).

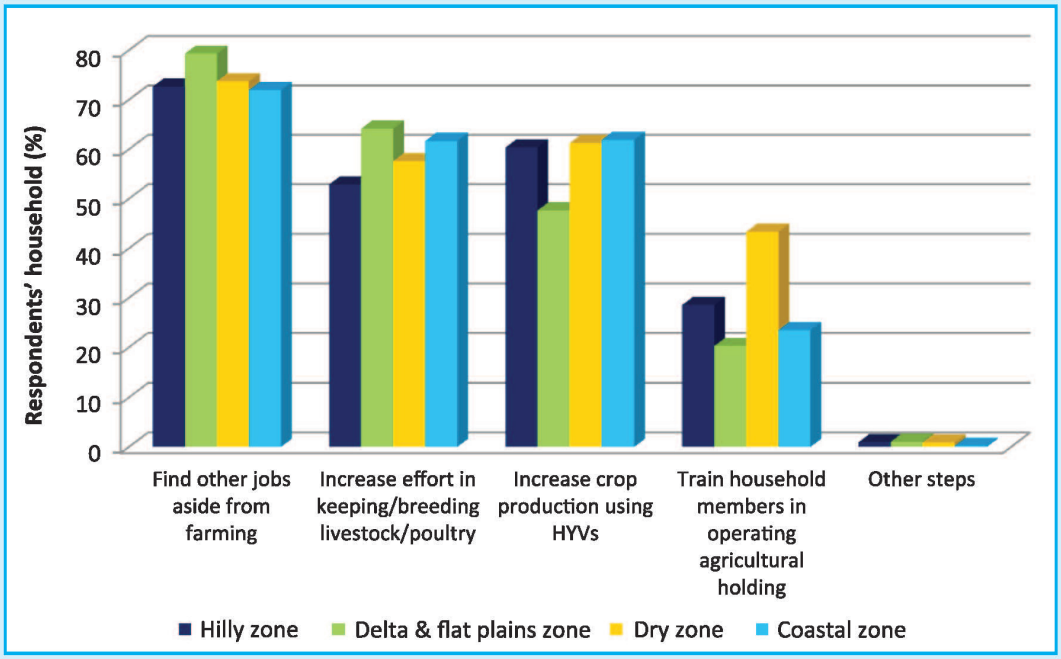


**Figure 1.9: Steps to be taken by respondents' household for food accessibility in coming future by zones in RoUM: 2010**

Source: Myanmar Census of Agriculture 2010

## 9. Conclusions

Myanmar is trying to produce enough food to lessen the country's food insecurity. The food production pattern is different in the different regions/states of Myanmar and so is food availability. Based on the fertility of the land, rainfall pattern and climatic situation, delta and coastal areas have higher levels of rice production than dry zone and mountainous areas. Because of the extreme climate change impacts, the crop productivity rate is very low in dry zone and hilly areas; accordingly the poverty incidence and food insecurity level is high. The survey results reveal that most of the households in the dry zone cannot depend on their own production for all basic food items and they have to buy some of these from the market. However, their major problem is unsustainability of income to buy enough food and high food prices. In contrast, most of the farmers in the dry zones are small-scale famers and they have insufficient or no land to grow their own food. In the hilly areas, most of the households consume vegetables from their own farms and nearly half of the households have to buy rice from the market. The major constraints on food accessibility are the low levels of crop production because of insufficient investment, no land to grow crops and high food prices because of the poor infrastructure (roads, markets information and networking).

As coastal and delta areas are vulnerable to cyclones, tsunami, storms and floods, production failure is always associated with natural hazards. Their food availability and accessibility are limited because of unavailability in the markets all the time and high food prices. In order to access food in the future, all the households want to increase their income from non-farm activities, set up or increase production of livestock and poultry, change to high yielding varieties and attract the young family members to be active and involved in farm production activities.

## 10. Recommendations

Based on the findings of food availability by zones, constraints on and challenges to food accessibility, perceptions of households related to future food availability and their willingness to address this, the following measures or policy interventions should be taken in order to enhance the food security of Myanmar:

- Price of basic food items should be stable at all times by controlling price fluctuations at harvest time with an effective price control mechanism.
- Credit and adaptable high yielding varieties should be provided to respective regions in order to increase crop yields and incomes.
- Employment opportunities should be created in both agriculture and non-agriculture sectors as these are very important for allocating surplus rural labour and increasing household incomes for sufficient food consumption.
- A favourable policy environment and incentives should be provided to establish labour-intensive small and medium scale agro-based industries to absorb surplus labour regionally.
- Capacity building and enhancing the institutional network from farmer to regional and state levels should be promoted.
- As agriculture plays an important role in food security on the macro and household levels, public investment in agriculture should take the form of making improvements in the agricultural infrastructure and introducing appropriate technologies to increase productivity for ensuring food accessibility in the future.
- More in-depth surveys regionally should be carried out to know the true picture of food security in the country. MCA 2010 can act as a baseline.

# Appendix

**Table 1: Sources of selected basic food obtained by respondents' agricultural households during the past 12 months in RoUM: 2010**

(Multiple response)

| No. | Selected basic food items | Own production | | Given by relatives | | Buying | | Other sources | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total HHs (N=4,095,059) | | Total HHs (N=1,004,525) | | Total HHs (N=5,409,879) | | Total HHs (N=536,213) | |
| | | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total |
| 1 | Cereal crops | 3,338,800 | 81.5 | 82091 | 8.2 | 2752565 | 50.9 | 46372 | 8.6 |
| 2 | Root crops | 251,978 | 6.2 | 285551 | 28.4 | 5171866 | 95.6 | 95767 | 17.9 |
| 3 | Edible dry pulses | 1,046,063 | 25.5 | 352809 | 35.1 | 4909071 | 90.7 | 95340 | 17.8 |
| 4 | Vegetables | 1,362,909 | 33.3 | 622522 | 62.0 | 4680499 | 86.5 | 243737 | 45.5 |
| 5 | Fruits | 643,170 | 15.7 | 379491 | 37.8 | 5105745 | 94.4 | 194302 | 36.2 |
| 6 | Edible nuts | 212,760 | 5.2 | 201406 | 20.0 | 4896570 | 90.5 | 217085 | 40.5 |
| 7 | Meat | 652,810 | 15.9 | 155920 | 15.5 | 5336060 | 98.6 | 96815 | 18.1 |
| 8 | Fish and seafood | 204,496 | 5.0 | 147947 | 14.7 | 5236611 | 96.8 | 146449 | 27.3 |

Source: Myanmar Census of Agriculture 2010

**Table 2: Food obtained from own production by respondents' agricultural households during the past 12 months by zones in RoUM: 2010**

(Multiple response)

| No. | Selected basic food items | Hilly zone | | Delta & flat plains | | Dry zone | | Coastal zone | | Union | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total HHs (N=763,945) | | Total HHs (N=1,574,839) | | Total HHs (N=1,398,723) | | Total HHs (N=357,552) | | Total HHs (N=4,095,059) | |
| | | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total |
| 1 | Cereal crops | 633,551 | 82.9 | 1,346,597 | 85.5 | 1,036,814 | 74.1 | 321,838 | 90.0 | 3,338,800 | 81.5 |
| 2 | Root crops | 121,006 | 15.8 | 26,091 | 1.7 | 75,375 | 5.4 | 29,506 | 8.3 | 251,978 | 6.2 |
| 3 | Edible dry pulses | 167,031 | 21.9 | 332,396 | 21.1 | 519,628 | 37.2 | 27,008 | 7.6 | 1,046,063 | 25.5 |
| 4 | Vegetables | 419,122 | 54.9 | 328,930 | 20.9 | 466,834 | 33.4 | 148,023 | 41.4 | 1,362,909 | 33.3 |
| 5 | Fruits | 132,892 | 17.4 | 354,271 | 22.5 | 107,861 | 7.7 | 48,146 | 13.5 | 643,170 | 15.7 |
| 6 | Edible nuts | 32,505 | 4.3 | 104,471 | 6.6 | 36,925 | 2.6 | 38,859 | 10.9 | 212,760 | 5.2 |
| 7 | Meat | 128,222 | 16.8 | 419,423 | 26.6 | 29,577 | 2.1 | 75,588 | 21.1 | 652,810 | 15.9 |
| 8 | Fish and seafood | 37,772 | 4.9 | 108,785 | 6.9 | 5,341 | 0.4 | 52,598 | 14.7 | 204,496 | 5.0 |

Source: Myanmar Census of Agriculture 2010

**Table 3: Food obtained from buying by respondents' agricultural households during the past 12 months by zones in RoUM: 2010**

(Multiple response)

| No. | Selected basic food items | Hilly zone | | Delta & flat plains | | Dry zone | | Coastal zone | | Union | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total HHs (N=876,140) | | Total HHs (N=2,402,620) | | Total HHs (N=2,312,315) | | Total HHs (N=431,458) | | Total HHs (N=5,409,879) | |
| | | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total | Frequency (No.) | % of Total |
| 1 | Cereal crops | 480,102 | 54.8 | 593,603 | 33.2 | 1,533,498 | 66.3 | 145,362 | 33.7 | 2,752,565 | 50.9 |
| 2 | Root crops | 749,543 | 85.6 | 1,771,423 | 99.0 | 2,255,992 | 97.6 | 394,908 | 91.5 | 5,171,866 | 95.6 |
| 3 | Edible dry pulses | 760,663 | 86.8 | 1,683,983 | 94.1 | 2,062,857 | 89.2 | 401,568 | 93.1 | 4,909,071 | 90.7 |
| 4 | Vegetables | 628,279 | 71.7 | 1,661,847 | 92.8 | 2,053,023 | 88.8 | 337,350 | 78.2 | 4,680,499 | 86.5 |
| 5 | Fruits | 771,800 | 88.1 | 1,724,027 | 96.3 | 2,226,616 | 96.3 | 383,302 | 88.8 | 5,105,745 | 94.4 |
| 6 | Edible nuts | 712,284 | 81.3 | 1,651,372 | 92.3 | 2,164,128 | 93.6 | 368,786 | 85.5 | 4,896,570 | 90.5 |
| 7 | Meat | 849,559 | 97.0 | 1,764,805 | 98.6 | 2,300,306 | 99.5 | 421,390 | 97.7 | 5,336,060 | 98.6 |
| 8 | Fish and seafood | 804,733 | 91.8 | 1,745,161 | 97.5 | 2,279,118 | 98.6 | 407,599 | 94.5 | 5,236,611 | 96.8 |

Source: Myanmar Census of Agriculture 2010

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The Republic of the Union of Myanmar
Ministry of Agriculture and Irrigation
Settlement and Land Records Department

# Distribution of Agricultural Lands Under Paddy in Different Regions

Chun Hlaing Win

## Abstract

Myanmar is a predominantly agricultural country with abundant natural resources. The agricultural land of Myanmar amounted to about 20 percent of the total land area according to the Myanmar Census of Agriculture (MCA) 2010 and 21 percent in 2010 according to the statistics of the Settlement and Land Records Department (SLRD). The area access to agricultural land was 0.53 hectare per capita in MCA 2003 whereas it was 0.52 hectare per capita in MCA 2010. The effective planted area of paddy in MCA 2010 increased by 74 percent from MCA 2003 whereas it increased by only 23 percent according to SLRD statistics for the same period. Even though the figure for the planted area of paddy in MCA 2010 was higher by 1.31 million hectares than that estimated by SLRD in 2010, the national yield of paddy was lower than the paddy yield proposed by the SLRD.

The agricultural population of Myanmar increased by 52.41 percent from 16.87 million in MCA 2003 to 25.72 million in MCA 2010. It had been found that there were 21 million hectares (31 percent) of the total land area of Myanmar on which access to agricultural land could be expanded. According to SLRD statistics in 2010, paddy sufficiency was about 130 percent in the whole country. Among the 17 regions and states of Myanmar in 2010, the four regions of Tanintharyi, Magway, Mandalay, Yangon and Chin state were not sufficient in paddy production. To be sufficient to meet the growing national and local demand, to increase exports, to store reserved rice for occasional disasters and unexpected events and to improve the yield and quality of paddy, it is necessary to expand the area under paddy by means of a nationwide intensification strategy.



**Keywords : Agricultural lands, Myanmar Census of Agriculture (MCA), SLRD statistics, planted area of paddy, paddy production, agricultural population, paddy sufficiency**

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## List of Abbreviations

| | |
|---|---|
| **MCA** | Myanmar Census of Agriculture |
| **SLRD** | Settlement and Land Records Department |
| **RoUM** | The Republic of the Union of Myanmar |

# Distribution of agricultural lands under paddy in different regions[1]

Chun Hlaing Win[2]

## 1. Introduction

The Republic of the Union of Myanmar is an agricultural country with an estimated population of about 60 million (2012) and a land area of 167.18 million acres or approximately 67.66 million hectares. The Union has eight regions and nine states with two major climatic regions: the tropical and subtropical or temperate region.

The country`s geographical location, topography and climatic conditions provide a setting for different agro-ecological zones and make it feasible to grow a wide variety of field and tree crops. Myanmar has four agro-ecological zones namely: the delta region, the central plain, the coastal region and the mountainous region.

Agriculture plays a crucial role in the economy of Myanmar. Three crop groups dominate agronomic activity in the country, namely cereals, oilseed crops and pulses. An estimated 21.52 million ha of land were cropped annually at an intensity of about 166 percent over the past seven years. By far the most important agricultural activity is the production of paddy and this can be found in different regions of the country.

The facts and statistics regarding the distribution of agricultural lands under paddy referred to here were taken primarily from the data sets of the Myanmar Censuses of Agriculture (MCA) in 2003 and 2010, and the Settlement and Land Records Department (SLRD) statistics in 2003 and 2010. It should be noted that the two sources used different definitions.

The SLRD covered almost all areas of all regions including remote regions to collect and compile crop and land statistics on the basis of field visits to *kwins*(the various small parcels of land on which crops are grown). However, MCA statistics were collected by conducting a survey of 0.56 million households in the census supplementary module. This was a sample of the 6.36 million households enumerated in the census core module. The sample covered 61 percent of households in the urban area and 87 percent of households in villages in 93 percent of village tracts in MCA 2010.

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[1] This paper was presented in the National Data Dissemination Seminar on the Myanmar Census of Agriculture 2010, in Myat Taw Win Hotel, Nay Pyi Taw on 5-6 November 2012.

[2] Chun Hlaing Win is the Assistant Director of the Settlement and Land Records Department of Ministry of Agriculture and Irrigation.

The descriptive statistics used in the analysis of land use were distribution of agricultural lands, net planted area of paddy, total planted area of paddy, paddy sufficiency and potential land resources of 17 regions and states.

## 2. Land use of Myanmar in 2003/2004 and 2010/2011

Reserved forest accounted for about 27 percent of total land use area in 2010/2011 whereas it accounted for 23 percent in 2003/2004 according to the annual report of the Central Statistics Organization. In contrast, "other wood land" accounted for about 27 percent in 2003/2004 and 23 percent in 2010/2011. The occupied area or the agricultural lands area, which was the sum of the current fallow land and the net sown areas excluding the area planted in association with squatter on other land types such as forest land and terrace plantations accounted for 10,771,000 ha in 2003/2004 and 12,251,000 in 2010/2011. Except for the reserved forest and the occupied land area, all other land uses decreased substantially from 2003 to 2010 (Table 1 and Figure 1).

**Table 1: Land use of Myanmar in 2003/2004 and 2010/2011**

| Type of land | Area (thousand ha) 2003/2004 | Percent (%) | Area (thousand ha) 2010-2011 | Percent (%) |
|---|---|---|---|---|
| Reserved forest | 15,134 | 23 | 17,916 | 27 |
| Current fallows | 517 | 0 | 230 | 0 |
| Net area sown | 10,254 | 15 | 12,021 | 18 |
| Occupied area | 10,771 | 15 | 12,251 | 18 |
| Cultivable waste other than fallows | 6,574 | 10 | 5,396 | 8 |
| Other wood land | 18,312 | 27 | 15,629 | 23 |
| Others | 16,867 | 25 | 16,466 | 24 |
| **Total area** | **67,658** | **100** | **67,658** | **100** |

Sources: Annual Report of Central Statistics Organization 2010

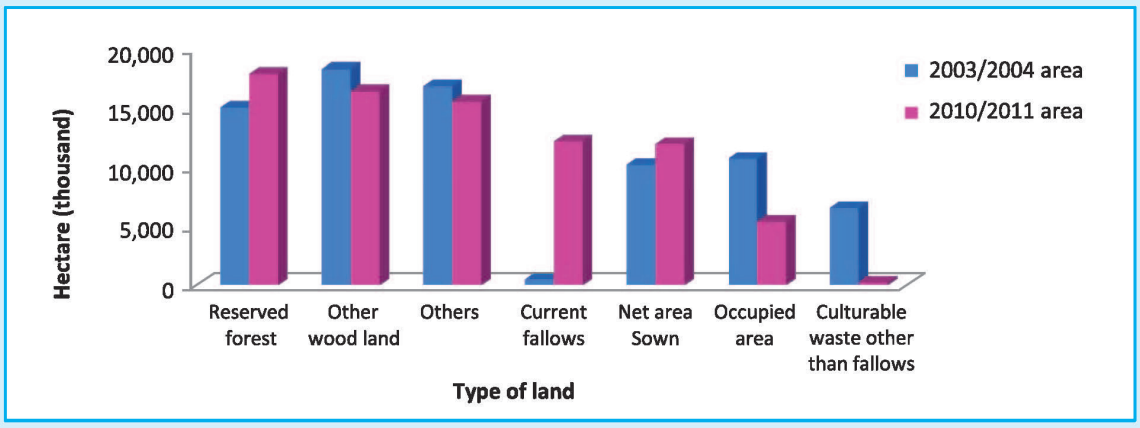


**Figure 1: Land use of Myanmar in 2003/2004 and 2010/2011**

The MCA 2010 classified land use according to the international system of land use classification, namely annual crop land, land under fallow, land under permanent crops and "other land". The land under annual or temporary crops and land under fallow were identified as arable land. Land under annual crops amounted to 91.70 percent of the total agricultural lands area whereas 7.6 percent was devoted to permanent crops. Land under fallow and "other land" amounted to 0.1 percent and 0.6 percent respectively. (Figure 2)

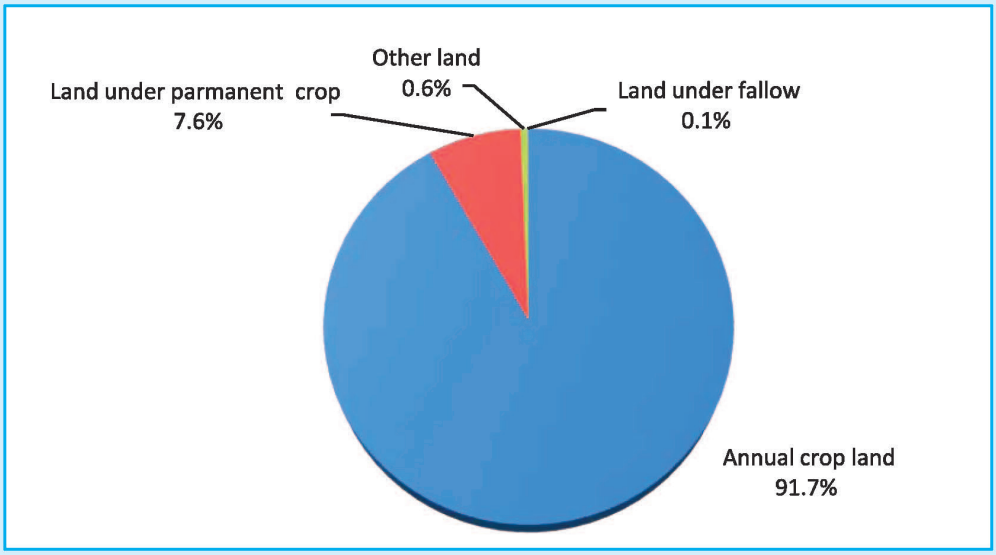


Figure 2: Main land use of agricultural lands in Myanmar by MCA 2010

## 3. Land distribution of Myanmar

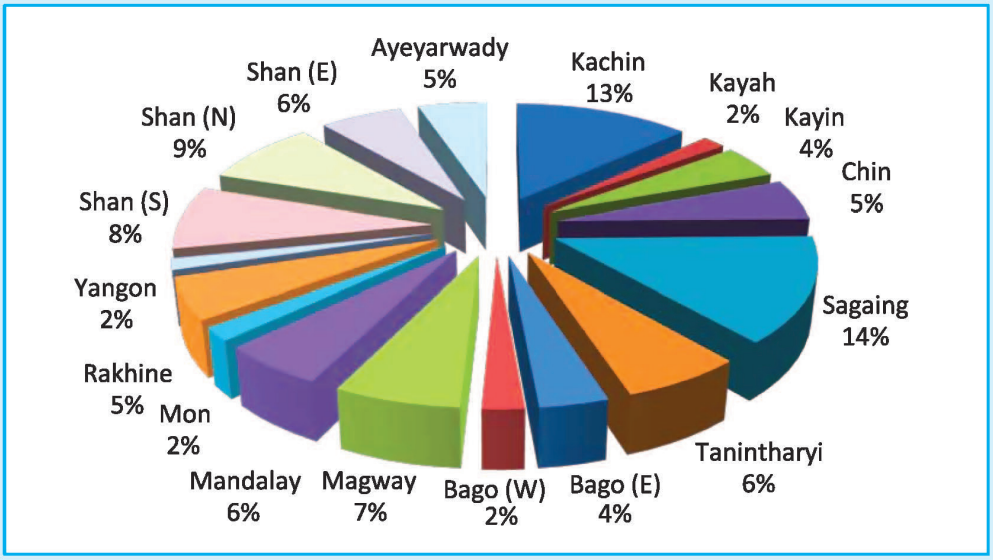


Figure 3: Distribution of land area in 17 regions and states, Myanmar

Of the 67.66 million hectares in Myanmar, the land area of Sagaing region and Kachin state dominated with 14 percent and 13 percent respectively. Yangon region, Bago (West) region, Mon state and Kayah state each accounted for 2 percent of the total land area. The remainder of states and regions accounted for between 4 percent and 9 percent as shown in Table 3 and Figure 3.

## 4. Distribution of agricultural lands in Myanmar censuses of agriculture in 2003 and 2010

The total agricultural lands area recorded by each MCA represented the sum of the sown area of several crops in different types of land belonging to all the agricultural crop holdings cultivated in the 12 months prior to the beginning of each census in 2003 and 2010.

Paddy land was the dominant land use in the 2003 census and the 2010 census accounting for nearly 55 percent and 56 percent respectively with a growth rate of 52 percent. Ya land covered almost 29 percent in both ofthe censuses. Rubber land grew by 235 percent between the two censuses. Kaing and garden land increased by 47 percent and 74 percent respectively whereas dhani and "other land" decreased significantly over the same period. The total agricultural land area with the addition of the area of special holdings increased from 8.98 million hectares in MCA 2003 to 13.33 million hectares in MCA 2010, an increase of about 48.41 percent as shown in Table 2 and Figure 4.

**Table 2: Agricultural lands by MCA 2003 and 2010**

| Land type | MCA 2003 | | MCA 2010 | | Growth rate (2003-2010) |
|---|---|---|---|---|---|
| | Area (thousand ha) | % to total | Area (thousand ha) | % to total | |
| Paddy | 4,929.56 | 54.89 | 7,509.84 | 56.34 | 52.34 |
| YA | 2,606.43 | 29.02 | 3,878.54 | 29.10 | 48.81 |
| Kaing | 377.60 | 4.20 | 555.67 | 4.17 | 47.16 |
| Garden | 365.94 | 4.07 | 636.29 | 4.77 | 73.88 |
| Dhani | 16.69 | 0.19 | 15.00 | 0.11 | -10.13 |
| Rubber | 90.88 | 1.01 | 304.35 | 2.28 | 234.91 |
| Other land type | 594.35 | 6.62 | 429.44 | 3.22 | -27.75 |
| **Total** | **8,981.45** | **100.00** | **13,329.13** | **100.00** | **48.41** |

Source: MCA 2003 and MCA 2010, SLRD

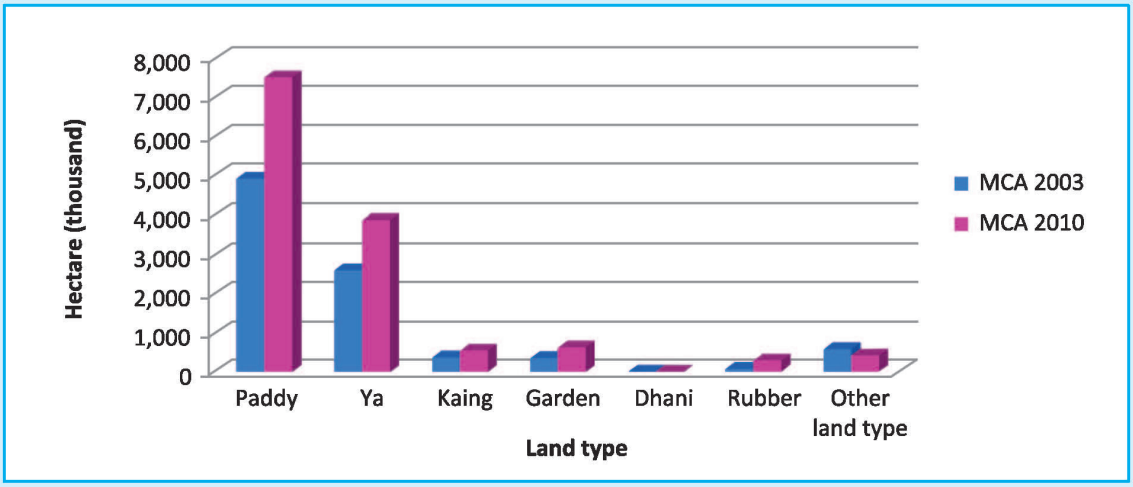


**Figure 4: Agricultural lands by MCA 2003 and 2010**

**Table 3: Total land area and agricultural lands by region/state in MCA 2010**

| Region/state | Total land area (thousand ha) | Agricultural land area (thousand ha) |
|---|---|---|
| Sagaing | 9,372 | 2,630.09 |
| Ayeyarwady | 3,503 | 2,373.33 |
| Mandalay | 3,794 | 1,491.17 |
| Magway | 4,482 | 1,368.48 |
| Yangon | 1,026 | 842.91 |
| Bago (E) | 2,450 | 828.59 |
| Mon | 1,228 | 728.30 |
| Bago (W) | 1,490 | 684.96 |
| Rakhine | 3,678 | 523.72 |
| Kachin | 8,906 | 439.99 |
| Shan (N) | 5,825 | 431.54 |
| Shan (S) | 5,609 | 335.17 |
| Tanintharyi | 4,335 | 334.49 |
| Kayin | 3,038 | 100.27 |
| Chin | 3,602 | 87.17 |
| Shan (E) | 4,148 | 77.37 |
| Kayah | 1,172 | 51.57 |
| **UNION** | **67,658** | **13,329.13** |

Sagaing, Ayeyarwady, Mandalay and Magway regions had the largest agriculture areas whereas Kayah, Shan (E), Chin and Kayin states had small areas of agriculture land relative to their size as shown in Table 3.

## 5. Distribution of agricultural lands of Myanmar by SLRD statistics

The agricultural land area of Myanmar as estimated by the Settlement and Land Records Department (SLRD) in 2003 was 11.56 million hectares, which represented 17 percent of the total land area, and 13.98 million hectares in 2010, which represented 21 percent of total land area. According to SLRD statistics, the agricultural land area increased by 21 percent from 2003 to 2010. The statistics covered all cultivated areas including those in remote places, sown areas that result from squatting in other land types and terrace plantations as shown in Table 4. The difference in agricultural lands as estimated by SLRD statistics in 2010 and MCA 2010 was 0.65 million hectare.

**Table 4: Total land area and agricultural land by region/state in 2003 and 2010 according to SLRD statistics, Myanmar**

| Region/State | Total land area (thousand ha) | Agricultural lands (thousand ha) | |
|---|---|---|---|
| | | 2003/2004 | 2010/2011 |
| Kachin | 8,906 | 244.84 | 467.42 |
| Kayah | 1,172 | 64.35 | 105.22 |
| Kayin | 3,038 | 304.33 | 472.68 |
| Chin | 3,602 | 92.27 | 139.21 |
| Sagaing | 9,372 | 1,805.75 | 2,158.24 |
| Tanintharyi | 4,335 | 318.09 | 520.03 |
| Bago (E) | 2,450 | 789.56 | 941.32 |
| Bago (W) | 1,490 | 571.43 | 678.67 |
| Magway | 4,482 | 1,186.16 | 1,298.66 |
| Mandalay | 3,794 | 1,501.01 | 1,541.89 |
| Mon | 1,228 | 475.92 | 703.76 |
| Rakhine | 3,678 | 500.61 | 621.21 |
| Yangon | 1,026 | 633.35 | 648.32 |
| Shan (S) | 5,609 | 443.95 | 634.97 |
| Shan (N) | 5,825 | 500.20 | 669.77 |
| Shan (E) | 4,148 | 120.19 | 245.65 |
| Ayeyarwady | 3,503 | 2,007.69 | 2,130.72 |
| **UNION** | **67,658** | **11,559.69** | **13,977.74** |

## 6. Effective planted area of paddy MCA 2003 and MCA 2010

The effective planted area of paddy in 2003 was 5.38 million hectares and this almost doubled to 9.36 million hectares in 2010. This shows that the cropping intensity of paddy in 2010 was more than 100 percent in the regions of Bago (East), Yangon and Ayeyarwady which had more than one crop of paddy per year. (Table 5)

**Table 5: Agricultural lands and planted area of paddy by MCA 2010, Myanmar**

(Unit - thousand ha)

| Region/state | Agricultural lands (Physical area) | Planted area of paddy (Effective area) |
|---|---|---|
| Ayeyarwady | 2,373.33 | 2,979.08 |
| Sagaing | 2,630.09 | 1,345.74 |
| Yangon | 842.91 | 874.85 |
| Bago (E) | 828.59 | 845.61 |
| Bago (W) | 684.96 | 590.59 |
| Mandalay | 1,491.17 | 535.18 |
| Rakhine | 523.72 | 488.46 |
| Mon | 728.30 | 455.78 |
| Magway | 1,368.48 | 401.22 |
| Kachin | 439.99 | 261.46 |
| Shan (N) | 431.54 | 171.18 |
| Shan (S) | 335.17 | 118.75 |
| Tanintharyi | 334.49 | 88.85 |
| Kayin | 100.27 | 76.53 |
| Shan (E) | 77.37 | 58.89 |
| Chin | 87.17 | 41.59 |
| Kayah | 51.57 | 29.34 |
| **UNION** | **13,329.13** | **9,363.11** |

As the agricultural lands were small in Kayah, Chin, Shan (East), Kayin, Tanintharyi, Shan (South), Shan (North) and Kachin, the planted areas of paddy were even smaller. Although agricultural lands were large in Magway and Mandalay in the central dry zone, the area planted with paddy was also small. For the whole country, the planted area of paddy in MCA 2010 increased by 74 percent from MCA 2003.

The majority of cultivated areas of paddy were between 0.5 million hectare and 2.9 million hectares in Mandalay, Bago (West), Bago (East), Yangon, Sagaing and Ayeyarwady in terms of area and the remainder of cultivated areas were under 0.5

million hectare. Moreover, the effective planted area of paddy in MCA 2010 was higher than that estimated by the SLRD in 2010 with the difference being 1.31 million hectares. (Table 5 and Table 9)

## 7. Agricultural lands and net planted area of paddy by region/state in Myanmar

In 2003, according to SLRD statistics, between 70 percent and 95 percent of the net planted areas of Bago (West), Shan (East), Bago (East), Rakhine, Yangon and Ayeyarwady was under paddy whereas in Kayah, Chin, Mon, Kayin and Kachin the areas under paddy were from 45 percent to 68 percent of the net planted area. For Magway, Mandalay, Sagaing, Shan (North), Tanintharyi and Shan (South) the amount was between 15 percent and 40 percent of their net planted areas, and for the whole of Myanmar, about 53 percent of total agricultural lands were utilized for paddy cultivation. (Table 6)

**Table 6: Agricultural lands and net planted area of paddy by SLRD statistics in 2003, Myanmar**

| Region/state | Agricultural lands (thousand ha) | Net planted area of paddy (thousand ha) | Percentage of paddy in agricultural lands |
|---|---|---|---|
| Ayeyarwady | 2,007.69 | 1,907.16 | 94.99 |
| Yangon | 633.35 | 545.41 | 86.12 |
| Rakhine | 500.61 | 391.22 | 78.15 |
| Bago (E) | 789.56 | 615.63 | 77.97 |
| Shan (E) | 120.19 | 89.23 | 74.24 |
| Bago (W) | 571.43 | 400.86 | 70.15 |
| Kachin | 244.84 | 166.12 | 67.85 |
| Kayin | 304.33 | 193.74 | 63.66 |
| Mon | 475.92 | 300.52 | 63.15 |
| Chin | 92.27 | 44.11 | 47.81 |
| Kayah | 64.35 | 29.41 | 45.71 |
| Shan (S) | 443.95 | 178.28 | 40.16 |
| Tanintharyi | 318.09 | 122.96 | 38.65 |
| Shan (N) | 500.20 | 175.63 | 35.11 |
| Sagaing | 1,805.75 | 553.84 | 30.67 |
| Mandalay | 1,501.01 | 261.90 | 17.45 |
| Magway | 1,186.16 | 187.64 | 15.82 |
| **UNION** | **11,559.69** | **6,155.40** | **53.25** |

Similarly, according to Table 6 Ayeyarwady had the largest area under paddy, 1.9 million hectares, whereas the cultivated areas of paddy were between 0.3 million hectare and 0.6 million hectare in each of Mon, Rakhine, Bago (West), Yangon, Sagaing and Bago (East) in terms of area. The remaining regions/states had between 0.03 and 0.26 million hectare under paddy.

In 2010, according to SLRD statistics, between 80 percent and 95 percent of the net planted areas of Rakhine, Bago (East), Bago (West), Yangon and Ayeyarwady was under paddy whereas in Kayah, Mon, Kachin, Kayin and Shan (East) the areas under paddy accounted for 41 percent to 68 percent. For Mandalay, Magway,Tanintharyi, Shan (North), Sagaing, Shan (South) and Chin between 21 percent and 40 percent of the net planted area was under paddy. About 55 percent of total agricultural lands in Myanmar were utilized for paddy cultivation. (Table 7)

**Table 7: Agricultural lands and net planted area of paddy by SLRD statistics in 2010, Myanmar**

| Region/state | Agricultural lands (thousand ha) | Net planted area of paddy (thousand ha) | % of paddy in agricultural lands |
|---|---|---|---|
| Ayeyarwady | 2,130.72 | 2,018.05 | 94.71 |
| Yangon | 648.32 | 542.98 | 83.75 |
| Bago (W) | 678.67 | 555.45 | 81.84 |
| Bago (E) | 941.32 | 763.75 | 81.14 |
| Rakhine | 621.21 | 498.06 | 80.18 |
| Shan (E) | 245.65 | 166.53 | 67.79 |
| Kayin | 472.68 | 274.27 | 58.02 |
| Kachin | 467.42 | 266.88 | 57.10 |
| Mon | 703.76 | 394.41 | 56.04 |
| Kayah | 105.22 | 42.77 | 40.64 |
| Chin | 139.21 | 56.25 | 40.41 |
| Shan (S) | 634.97 | 255.17 | 40.19 |
| Sagaing | 2,158.24 | 788.16 | 36.52 |
| Shan (N) | 669.77 | 197.08 | 29.43 |
| Tanintharyi | 520.03 | 150.48 | 28.94 |
| Magway | 1,298.66 | 369.35 | 28.44 |
| Mandalay | 1,541.89 | 328.27 | 21.29 |
| **UNION** | **13,977.74** | **7,659.64** | **54.80** |

Similarly, according to Table 7 Ayeyarwady had the largest area under paddy, 2.02 million hectare, whereas the cultivated areas of paddy were between 0.5 million hectare and 0.8 million hectare in each of Rakhine, Yangon, Bago (West), Bago (East) and Sagaing. The rest had between 0.04 and 0.40 million hectare under paddy.

## 8. Effective planted area, harvested area, yield and production of paddy in Myanmar by SLRD statistics

The effective planted area of paddy in Myanmar increased gradually after 1984/1985 according to the statistics of the Settlement and Land Records Department as shown in Figure 5.

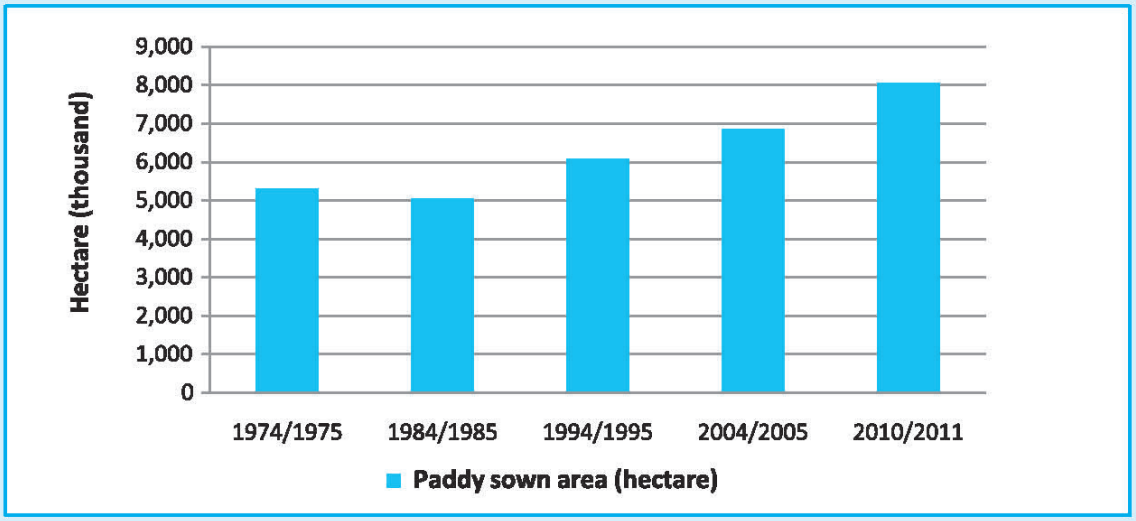


**Figure 5: Effective planted area of paddy in the past, Myanmar**

Source: SLRD Statistics

**Table 8: Effective planted area, harvested area, yield and production of paddy in Myanmar**

| Year | Planted area (thousand ha) | Harvested area (thousand ha) | Yield (ton/ha) | Production (thousand metric ton) |
|---|---|---|---|---|
| 2003/2004 | 6,545 | 6,530 | 3.54 | 23,142 |
| 2004/2005 | 6,860 | 6,810 | 3.64 | 24,758 |
| 2005/2006 | 7,392 | 7,387 | 3.75 | 27,691 |
| 2006/2007 | 8,128 | 8,078 | 3.83 | 30,932 |
| 2007/2008 | 8,093 | 8,015 | 3.93 | 31,459 |
| 2008/2009 | 8,097 | 8,081 | 4.03 | 32,582 |
| 2009/2010 | 8,070 | 8,061 | 4.06 | 32,691 |
| 2010/2011 | 8,050 | 8,015 | 4.07 | 32,588 |

Source: SLRD Statistics

Nationally, the harvested area of paddy indicated that it was slightly less than the effective planted area according to SLRD crop statistics. The average planted area of paddy was 7.65 million hectares whereas the average harvested area of paddy was

7.62 million hectares between 2003 and 2010. At the same time, the average paddy production was 29.48 million metric tons and average yield was 3.85 tons per hectare. There was a significant increase in the productivity of paddy from 2003 to 2009 but not between 2009 and 2010, and the yield slightly increased over the past seven years. (Table 8, Figure 6 and Figure 7)

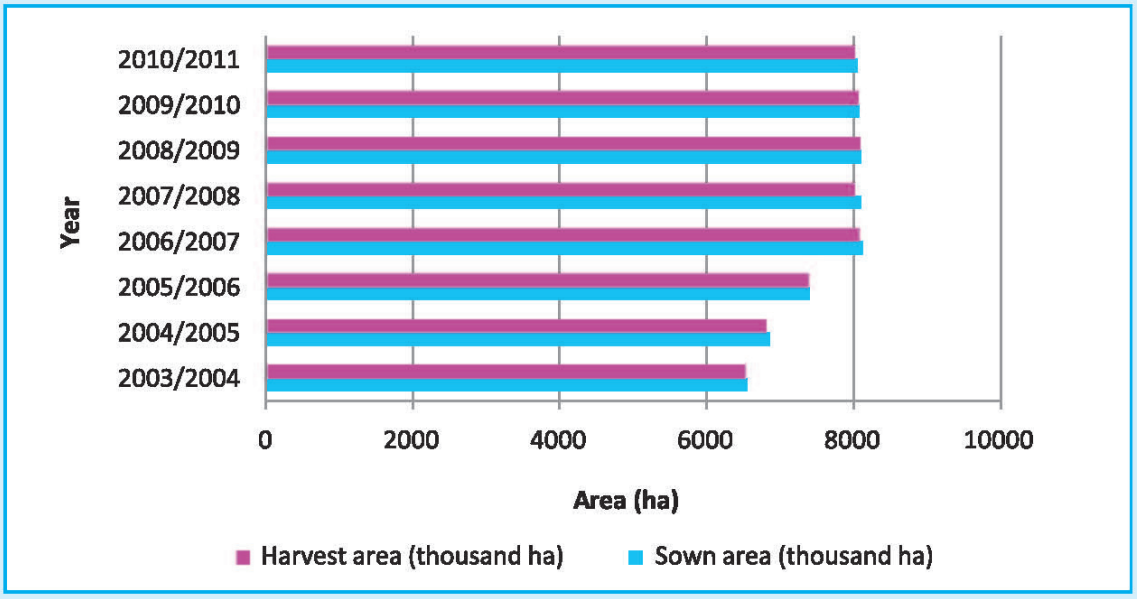


**Figure 6: Comparison of planted area and harvested area of paddy in Myanmar**

Source: SLRD Statistics

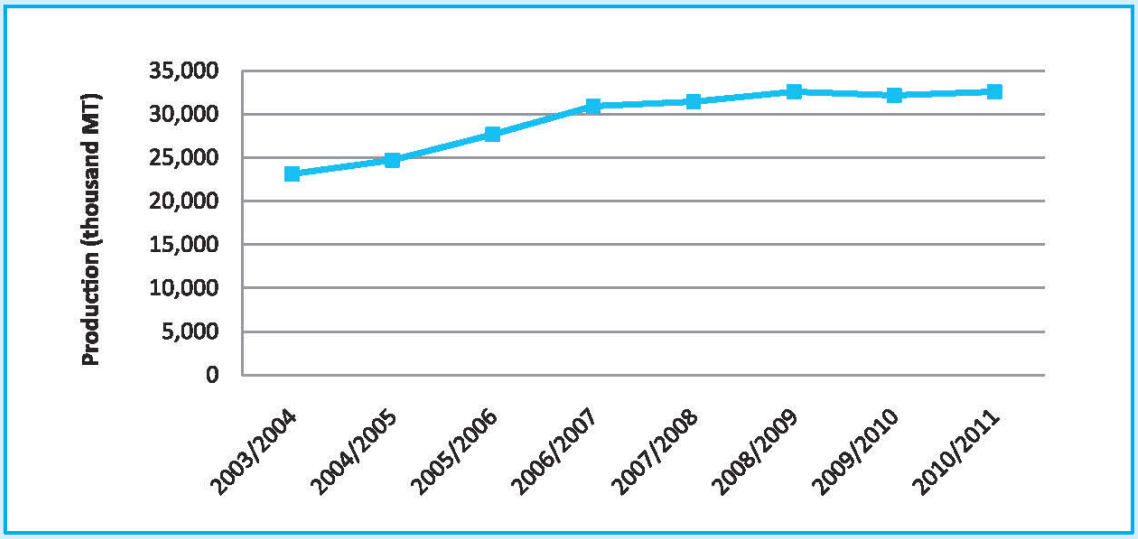


**Figure 7: Production of paddy in Myanmar**

Source: SLRD Statistics

The total or effective planted area of paddy in Myanmar increased from 6.54 million hectares in 2003/2004 to 8.05 million hectares in 2010/2011, an increase of about 23 percent. The average annual change of paddy area was 3.29 percent. (Table 9)

**Table 9: Total planted area and growth rate of paddy from 2003/2004 to 2010/2011, Myanmar**

| Region/state | Planted area (thousand ha) 2003/2004 | Planted area (thousand 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 | 563.74 | -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 |
| **UNION** | **6,545.10** | **8,050.35** | **23.00** | **3.29** |

## 9. Total population, agricultural population and access to agricultural lands in Myanmar

The population of Myanmar was projected as 59.78 million in 2010 whereas it was 53.22 million in 2003. In 2010, there were 18.34 million urban residents and 41.44 million rural residents and the population growth rate was 12.32 percent. The agricultural population of Myanmar increased by 52.41 percent from 16.87 million in MCA 2003 to 25.72 million in MCA 2010. The agricultural population was estimated to be 43 percent of the total population of Myanmar in 2010 and 32 percent in 2003.

The population with access to agricultural lands was approximately 16.9 million, giving a figure of 0.53 hectare per capita in MCA 2003 whereas it was approximately 25.7 million giving a figure of 0.52 hectare per capita in MCA 2010. Although the amount of agricultural land available increased significantly, there was little difference in the amount of land per capita between the two agriculture censuses. (Table 10)

**Table 10: Access to agricultural lands by agricultural population in Myanmar**

| Agriculture census | Agricultural land (thousand ha) | Agricultural population (thousand) | ha/capita |
|---|---|---|---|
| MCA 2003 | 8,981.45 | 16,876 | 0.53 |
| MCA 2010 | 13,329.10 | 25,721 | 0.52 |

## 10. Paddy sufficiency situation in Myanmar, 2010

Paddy sufficiency for the whole country in 2010 was about 130 percent according to SLRD statistics. Among the 17 regions and states of Myanmar, the paddy sufficiency of Chin state and Tanintharyi, Magway, Mandalay and Yangon regions was between 56 and 86 percent. The paddy sufficiency of the remaining regions and states was between 114 and 234 percent and surplus production occurred substantially as shown in Annex Table 1. (The paddy production figure in MCA 2010 was not available.)

According to SLRD statistics, the paddy production increased by 41 percent from 2003 to 2010 whereas FAO projections for the same period gave a 43 percent increase. Apart from this evaluation, the agricultural production index also increased from 84.63 in 2003 to 122.54 in 2010. The index of total cereal production also increased from 83.77 in 2003 to 115.71 in 2010 according to FAO projections as well. This shows that in general the people of Myanmar have access to food. However, the paddy insufficiency referred to above in one state and four regions needs to be addressed.

## 11. Potential land resources

According to the Union Land Stock by SLRD in 2010, 31 percent or 21 million hectares of the total land area of Myanmar was reserved land for agriculture and multi-purposes. Kachin state, Shan state (North), Shan state (South), Shan state (East), Sagaing region, Chin state, Tanintharyi region, Rakhine state, Kayin state, Magway region and Mandalay region were identified as promising areas to expand the agricultural lands for the production of several crops. (Table 11)

**Table 11: Potential land resources for agriculture expansion, 2010, Myanmar**

(Unit – thousand ha)

| Region/state | Vacant and fallow lands | Virgin lands | Total potential lands |
|---|---|---|---|
| Kachin | 1,456.09 | 2,571.83 | 4,027.92 |
| Shan (N) | 265.07 | 2,327.80 | 2,592.88 |
| Shan (S) | 481.18 | 1,658.84 | 2,140.02 |
| Shan (E) | 1,195.47 | 867.26 | 2,062.73 |
| Sagaing | 135.98 | 1,774.99 | 1,910.97 |
| Chin | 1,208.82 | 461.76 | 1,670.58 |
| Tanintharyi | 262.65 | 1,328.61 | 1,591.26 |
| Rakhine | 106.84 | 1,424.52 | 1,531.36 |
| Kayin | 45.33 | 1,284.50 | 1,329.83 |
| Magway | 60.30 | 1,051.40 | 1,111.70 |
| Mandalay | 31.16 | 380.01 | 411.17 |
| Kayah | 16.19 | 174.02 | 190.21 |
| Ayeyarwady | 29.14 | 150.95 | 180.09 |
| Bago (E) | 41.28 | 60.30 | 101.58 |
| Mon | 6.07 | 83.37 | 89.44 |
| Bago (W) | 50.99 | 28.73 | 79.72 |
| Yangon | 3.24 | 1.21 | 4.45 |
| **Total** | **5,395.79** | **15,630.11** | **21,025.90** |

## 12. Conclusions

According to SLRD statistics, agricultural land increased by 21 percent from 2003 to 2010 whereas it increased by 48.41 percent over the same period according to the MCA. The figures for developed agricultural land also differed with SLRD statistics giving a figure of 21 percent of the total land area in 2010 whereas in the MCA 2010 the figure was 20 percent. Thus the difference between two data sets on developed agricultural lands was minimal. The data also shows that Myanmar still has potential land resources for expansion of agriculture and other purposes and for the promotion of access to agricultural land.

According to SLRD statistics, 55 percent of agricultural lands were utilized for the net planted area of paddy in 2010, a slight increase over the 53 percent in 2003. The effective planted area of paddy for the whole country in MCA 2010 was higher by 1.31 million hectares than that of paddy when compared to the SLRD statistics in 2010. The effective planted area of paddy in MCA 2010 increased by 74 percent from MCA 2003 whereas the figure was only 23 percent according to SLRD statistics for the same period.

According to MCA 2010, the planted areas of paddy in Ayeyarwady was 2.97 million hectares and the paddy area was between 0.4 million hectare and 1.35 million hectares in each region/state of Magway, Mon, Rakhine, Mandalay, Bago (West), Bago (East),Yangon, and Sagaing. In the remaining regions/states the planted area was 0.26 million hectare.

The target yield of paddy in Myanmar was proposed as 5.15 ton per hectare whereas the average yield from 2003 to 2010 was 3.85 ton per hectare. World paddy yield and yields in Southeast Asia, Japan and Vietnam were 4.31, 4.03, 6.78 and 5.22 ton per hectare respectively in 2008. This suggests that Myanmar has to increase paddy yield through intensification to meet the growing national and local demand, to increase exports and to store reserved rice for occasional disasters and unexpected events.

In addition, the present government has identified eight tasks including the development of agricultural productivity and has been implementing these tasks simultaneously as part of its rural development and poverty alleviation efforts since it came into office. The government's target is to reduce the poverty rate from 26 percent to 16 percent by 2015. The president had also projected that national gross domestic product (GDP) will rise by an annual average 7.7 percent till 2015/2016 and average per capita GDP will increase by 1 to 7 fold by 2015/2016 based on 2010/2011 constant prices. The above targets require the development of the agricultural sector, the expansion of the cultivable area and improvements in the yield and quality of major crops, particularly paddy.

## 13. Recommendations

The following measures and policy interventions are recommended based on the land resources, agricultural land, planted area of paddy, yield and paddy sufficiency of each region and state of Myanmar as below:

- Promoting the present paddy production to reach optimum production using intensification strategy in promising land.
- Improving the availability and adoption of quality seed and modern varieties of paddy.
- Expanding agricultural land by developing vacant, fallow and virgin lands deemed potential land resources to promote access to agricultural land.

- Maintaining the existing irrigated land to maximize yield and cropping intensity.
- Promoting integrated mountain development for encouragement of sustainable upland cultivation.
- Diversifying the crops that are suited to the local climate and topography for easy access to food.
- Organizing the participation of the private sector in agriculture investment.
- Supporting advanced technology and reasonable agricultural loans to farmers.
- Developing an agricultural production system that favours a Green Economy and the Green Growth of Myanmar.

# Annex table

**Table 1: Paddy sufficiency situation in Myanmar, 2010**

| State/Region | Estimation of total production of paddy | | | | Population | | Utilization | | | | | Surplus (ton) | Sufficiency (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Planted area (ha) | Harvested area (ha) | Yield (ton/ha) | Production (ton) | Urban | Rural | Seed (ton) | Waste (ton) | Consumption (ton) | Other (ton) | Total (ton) | | |
| Kachin | 267.10 | 266.44 | 3.56 | 948.78 | 451 | 1,128 | 26.72 | 63.11 | 466.09 | 69.92 | 625.84 | 322.94 | 151.60 |
| Kayah | 45.33 | 45.46 | 3.39 | 154.04 | 118 | 238 | 4.68 | 10.71 | 104.06 | 15.61 | 135.06 | 18.98 | 114.06 |
| Kayin | 274.79 | 274.86 | 3.49 | 957.87 | 281 | 1,535 | 27.13 | 62.45 | 550.94 | 82.65 | 723.16 | 234.71 | 132.46 |
| Chin | 56.25 | 55.95 | 2.23 | 124.93 | 120 | 434 | 4.63 | 7.05 | 165.93 | 24.90 | 202.51 | -77.59 | 61.69 |
| Sagaing | 927.56 | 926.63 | 4.30 | 3,984.99 | 1,235 | 5,306 | 95.67 | 276.69 | 1,970.44 | 295.58 | 2,638.38 | 1,346.60 | 151.04 |
| Tanintharyi | 150.55 | 150.45 | 3.50 | 527.24 | 528 | 1,186 | 15.28 | 35.25 | 503.54 | 75.53 | 629.60 | -102.36 | 83.74 |
| Bago (E) | 799.27 | 798.93 | 3.88 | 3,098.64 | 823 | 2,492 | 82.44 | 123.66 | 986.29 | 147.00 | 1,339.39 | 1,759.25 | 231.35 |
| Bago (W) | 590.45 | 590.58 | 3.82 | 2,254.56 | 669 | 2,024 | 60.94 | 91.42 | 801.20 | 120.00 | 1,073.56 | 1,181.00 | 210.01 |
| Magway | 426.55 | 425.31 | 4.22 | 1,796.31 | 1,063 | 4,560 | 45.83 | 128.29 | 1,693.82 | 254.06 | 2,122.01 | -325.71 | 84.65 |
| Mandalay | 390.53 | 390.19 | 4.31 | 1,682.71 | 2,847 | 5,575 | 40.70 | 120.99 | 2,458.39 | 368.75 | 2,988.83 | -1,306.13 | 56.30 |
| Mon | 407.53 | 407.54 | 3.63 | 1,477.33 | 1,093 | 2,044 | 32.43 | 79.25 | 913.66 | 137.04 | 1,162.38 | 314.96 | 127.10 |
| Rakhine | 501.01 | 468.80 | 3.63 | 1,701.26 | 656 | 2,650 | 51.64 | 130.51 | 993.93 | 149.08 | 1,325.15 | 376.11 | 128.38 |
| Yangon | 563.74 | 563.80 | 3.55 | 2,000.92 | 5,440 | 1,583 | 58.15 | 140.57 | 1,858.05 | 278.71 | 2,335.48 | -334.56 | 85.68 |
| Shan (S) | 258.20 | 258.29 | 3.46 | 892.39 | 597 | 1,608 | 26.63 | 39.95 | 652.93 | 98.00 | 817.51 | 244.30 | 129.88 |
| Shan (N) | 198.30 | 198.03 | 4.95 | 979.26 | 659 | 1,877 | 20.25 | 30.62 | 752.68 | 113.00 | 916.54 | 410.75 | 144.82 |
| Shan (E) | 167.54 | 167.61 | 3.90 | 653.51 | 246 | 673 | 17.32 | 25.98 | 272.31 | 41.00 | 356.61 | 577.20 | 261.86 |
| Ayeyarwady | 2,022.66 | 2,022.62 | 4.13 | 8,357.45 | 1,517 | 6,524 | 208.67 | 579.84 | 2,422.39 | 363.37 | 3,574.27 | 4,783.18 | 233.82 |
| **Union** | **8,047.35** | **8,011.48** | **3.76** | **30,131.87** | **18,343** | **41,437** | **814.23** | **2,168.22** | **17,566.64** | **2,635.02** | **23,184.10** | **6,947.77** | **129.97** |

## Calculation

Seed – 0.10 ton per hectare
Waste – 6.65 percent of production
Consumption –251 kg per urban resident and 313 kg per rural resident
Other - 15 percent of consumption
Population – 2010-2011 (Estimation)

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