

CHAPTER I

INTRODUCTION

1.1 Background

Myanmar is located in Southeast Asia, bordering the Andaman Sea and the Bay of Bengal, between Bangladesh and Thailand. It is the largest country of the Southeast Asia mainland. Geographically Myanmar is located between 9° 32' to 28° 31' North Latitudes and 92° 10' to 101° 11' East longitudes. It has a common boundary with Thailand, Bangladesh, India, China and Laos. Myanmar can be taken as a forest-clad mountainous country. With plateaus, valleys, plains, mountain ranges with varying altitudes from 900 to 2,100 meters above mean sea level form natural boundaries between her neighbours. Myanmar is in AEZ (Agro-ecological zone) two which characterized as warm sub humid tropics. It receives its annual rain mainly from the South-West monsoon from mid May to mid October. The precipitation varies depending on the locality, elevation and months. The land area of Myanmar is 678,577 sq kilometers or approximately over 68 million hectares.

Myanmar is endowed with plentiful natural resources of land, water, fauna, flora and a favorable climate, which forms the basis for the development of agricultural sector. The natural diversity of Myanmar with favorable physical resources provides a great deal of opportunities for cultivation of various kinds of crops. The total cultivated area under various crop cultivations is about 11.73 million hectares (17.25 percent of the total area)

(MOAI, 2008). The wide range of tropical, sub-tropical and temperate climate are also suitable for growing crops under intensification, expansion and diversification. Based on this background, agriculture is the main source of livelihood for the majority of people. About 62 per cent of inhabitants are on agriculture-related activities in Myanmar; and it is considered as the primary engine of growth of the economy. The agriculture sector; as the backbone of the Myanmar's economy development contributes 37 percent of GDP (2006-07), 13.3 percent of total export earnings and employs about 61.2 percent of the total labor force (MOAI, 2008).

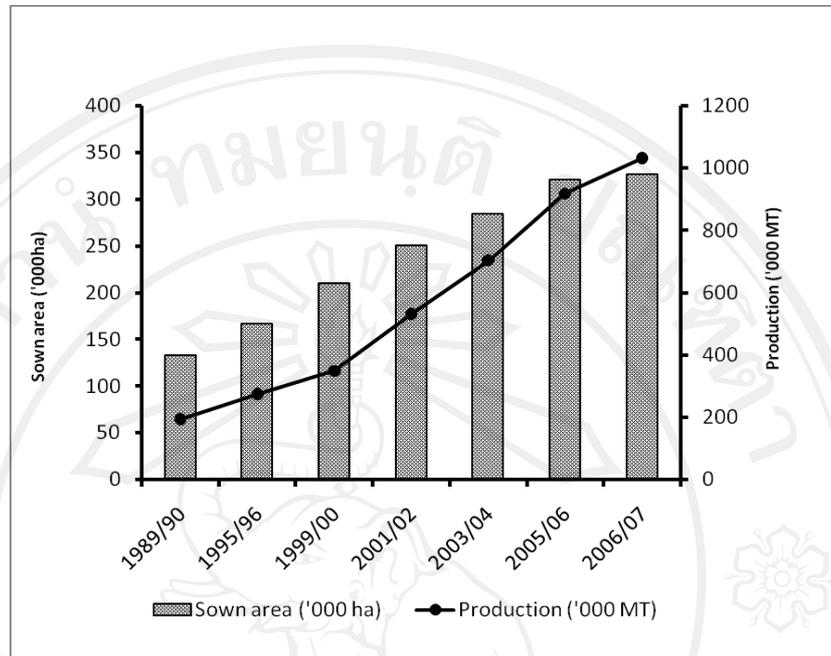
Table 1.1: Crop productions in Myanmar, 2007

Crop	Cultivated Area ('000 hectare)	Production (Metric Tons)
Paddy	8020	3.74
Maize	327	3.16
Wheat	92	1.55
Black gram	898	1.34
Green gram	1006	1.05
Soy bean	157	1.30
Chick pea	269	1.25
Pigeon pea	567	1.16
Groundnut	756	1.46
Sesame	1416	0.46
Cotton	354	0.76
Sugarcane	149	56.57

Source: Ministry of Agriculture and Irrigation, Settlement and Land Records Department.

More than 60 different crops are grown on the prevalence of different agro-ecological zones in Myanmar. Crops grown in the country can be classified into seven categories, namely; cereals, oilseeds, food legumes, industrial crops, vegetables, plantation crops and miscellaneous crops. Among them cereal crops constitute the largest share with 40 per cent of the multiple crop sown area followed by pulses and oilseeds (MOAI, 2008). Major crops in Myanmar are paddy, maize, wheat, black gram, green gram, soybean, chickpea, pigeon pea, groundnut, sesame, cotton and sugarcane (Table 1.1).

Maize area increased by 146 per cent (133,000 to 327,000 hectare) during 1989 to 2007 with an annual increase of 8.1 per cent (MOAI, 2007). Its production increased from 194,000 to 1,032,000 metric tons (MT) from 1989 to 2007 (Figure 1.1) (MOAI, 2007). It can be noticed that the production of maize has increased mainly by bringing more land under cultivation.



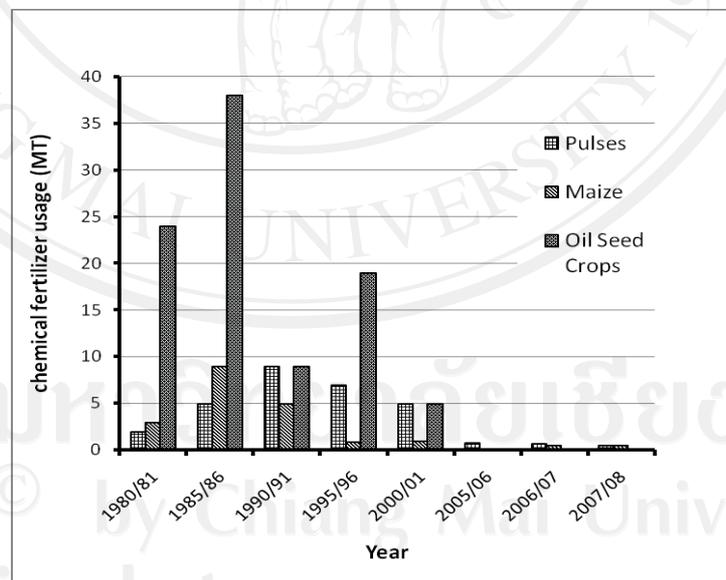
Source: MOAI (2007)

Fig.1.1: Sown area and production of maize (1989-2007)

There are about ten maize varieties grown in Myanmar. Six hybrid varieties are widely grown: CP Company supplies two varieties (CPDK 888, CPDK 989) that introduced from Thailand since 1995 and the others are released by the Department of Agricultural Research at Yezin in Mandalay Division since 1992. The choice of the maize variety is determined by farmers' objectives, length of the growing season, the elevation, and the amount of rainfall at the given locality.

On the other hand, fertilizer is also important in maize production: especially chemical fertilizers. In Myanmar, ammonium sulphate, T-super and muriate of potash have been utilizing at farmers' level since 1962. In 1965, ammonium sulphate was

replaced by urea and urea is commonly being used for all crops until now (MAS, 2000). However, the supply and the use of chemical fertilizers for maize production are small in comparison to the other crops from 1980 to 2008. It is illustrated in Figure 1.2 (DAR, 2009). When chemical fertilizers were introduced in the late 1900s, there were dramatic increases in crop yield. Introduction of high yielding varieties also helped to improve the crop yield. Since fertilizer use by farmers has been considerably less than the level of recommended, amid the high nutrient requirement of high yielding varieties, there has been a substantial depletion of plant nutrients from soil. This has resulted in a critical decline in soil fertility and productivity (C.C. Myint, http://www.infrc.or.jp/english/KNF_Data_Base_Web/PDF%20KNF%20Conf%20Data/C1-3-005.pdf).



Source: DAR (2009)

Figure 1.2 Use of chemical fertilizer (*000 MT)

In 1990, the government of Myanmar initialized trade liberalization policies. Owing to this policy, the government and private sector imported various fertilizers in 2003-2004 as shown in Table 1.2. After 1990, with initiation of these trade liberalization policies, the private sector participated and competed with government agencies (e.g. Myanmar Agriculture Service, MAS) in the fertilizer procurement and distribution. For the distribution of fertilizers, MAS was holding its role because of its storage facilities and agricultural extension staff who could reach the grass root level of farmers. Moreover, sometimes MAS's fixed fertilizer prices were cheaper than that offered by the private sector.

Table 1.2 Fertilizer import (2003-2004 MT)

Type of fertilizer	Border trade (MT)	Normal trade (MT)	Total
Urea	109,506	47,979	157,485
T-Super	78,255	19,500	97,755
Potash	205	10,000	10,205
Compound	25,372	7,516	32,888
Ammonium Nitrate	4,159	–	4,159
Ammonium Sulphate	435	13	448
Foliar Spray	–	138	138
Others	–	440	440

Source: <http://www.fao.org/docrep/010/ag120e/AG120E15.htm>

At present, the private fertilizer trade has grown significantly in Myanmar. The local traders mainly import Urea fertilizer from Qatar, Iran and Indonesia and phosphates fertilizers from the neighboring countries like People's Republic of China and Thailand. Private entrepreneurs put up in the local market and import fertilizers through borders trade as well as normal trade. In Myanmar, states and division authorities, the member of State Peace and Development Council (SPDC) are also responsible to increase the agricultural production. Some of the regional commanders obtain fertilizers from local entrepreneurs and distribute to farmers in terms of after harvest payment with the help of MAS extension staff.

However, farmers are currently not using chemical fertilizers in crop production according to the recommended rate in Myanmar. Therefore, there is a need to investigate the factors affecting the adoption of chemical fertilizers in maize cropping system in study area.

1.2 Rationale

With the rapid increase of worldwide maize consumption, there is a greater need to increase the productivity of the crop for animal feed or fodder. This is a concern because there are many factors affecting the adoption of fertilizer application in maize production.

Myanmar Government has issued several agricultural strategies to obtain target yields in ten major crops including maize. Utilization of adequate fertilizers is one of the main policies to get target yields (MOAI, 2008). Among the cereal crop production in

Myanmar, maize is the second most important crop after rice (John Ba Maw *et al*, 2000). In Myanmar, total sown area of maize is 350,000 ha and national yield is about 3 tons per hectare (tons ha⁻¹) in 2007 (MOAI, 2007). Maize is cultivated mainly in the country's Shan, Chin, Sagaing, Magway and Mandalay states and divisions as a seasonal crop in monsoon and winter. However, yield is low in Shan State being about 2.9 tons ha⁻¹ under rain-fed conditions.

Due to soil type, climatic conditions, low yield, low soil fertility, high cost of fertilizers, and varieties, many smallholders face difficulties in sustaining their livelihood. There are few studies conducted on the use of technologies of maize production in Southern Shan State. As chemical fertilizers are important technological inputs to the improvement in crop production, it is essential to assess the factors affecting the adoption of chemical fertilizer application technology in maize production in Southern Shan State. So that farmers will be able to fully benefit from the new crop technologies especially the new maize seeds.

1.3 Objectives of the study

Given the above conditions in Myanmar, the study has its objectives as follows:

1. To investigate farmers' agronomic practices in maize cropping system of Southern Shan State in Myanmar.
2. To identify factors affecting the adoption of chemical fertilizer application technologies in the study area.
3. To assess the profitability of the adoption of chemical fertilizer application technologies.