CHAPTER VI

CONCLUSIONS AND SUGGESTIONS

6.1 Conclusions

Myanmar is one of the developing countries and still remains as a poor country with its economy mainly depend on agricultural production for national food sufficiency. National food security being always an important issue due to approximately 75 percent of total population exists in the rural area.

Oilseed is a critical role in Myanmar agricultural sector and groundnut in which has high level in oil yielding per hectare is also second most important to the diet of Myanmar population followed by rice, staple food in Myanmar. As much, groundnut productivity is still required in demand for domestic consumption in the country; Myanmar edible oil crop is set to expand to increase productivity and quality by using the technical assistance from research development for future agricultural development.

The central region of Myanmar, including Mandalay division and Magway division, was conducted as study area in 2007. These areas are covered under the rainfed conditions. Main objective of this study is to identify characteristic of groundnut production and factors affecting technical efficiency of groundnut production. This study has tried to estimate the technical efficiency for groundnut production in the central region. This study would benefit both policy makers and researchers to improve the groundnut production level of efficiency. In addition, extension officers also would find the suitable information for predicting crop managements need the new production technologies.

Using detailed survey data estimated from 269 farmers throughout 2006/2007 cropping season. The sample size was 269 observations comprising 118 and 151 observations from Mandalay Division and Magway Division, respectively. The primary data was collected by interviewing farmers from communities of the districts in the selected central region with a standardize questionnaire. The secondary data

was collected from the Myanmar Agriculture Services under Ministry of Agriculture and Irrigation, and from the other official information resources.

In this study, the technical efficiency was estimated by the ratio of the observed output to the estimated value of the frontier output. It focuses on the potential yield, farmer's actual yield and explained the difference or yield gap between yields from two divisions. In each division, according to the variations, it seems that general situations occurred; Mandalay farmers' yield gap was narrow yield gap and the yield gap of Magway was large. Frontier efficiency has been used extensively in measuring the level of technical efficiency. Efficiency measures are important because it is a factor for productivity growth to benefit the economies by determining the level to be possible to raise productivity with the existing resource base and available technology.

Climate in central region is suitable for groundnut production. The normal rainfall in Mandalay is 864 mm and 787 mm in Magway (CSO, 2006). Most sample farmers cultivated groundnut as first crop in the groundnut-based cropping patterns in monsoon and winter season. Groundnut was grown between in the April and in the May and then was harvested during between July and August.

Although lands owned by Union of Myanmar, Myanmar government allowed farmers to grow crops. Some farmers shared land with their relatives without any official land renting system in the study areas. Range of farm size of most groundnut farmers were from 1 to 3 hectares in Mandalay and more than 3 hectares in Magway. The average groundnut production area was nearly 1 hectare/household in Mandalay and 1.64 hectare/household in Magway. For the view of soil quality, 26 percent of sample farmers in Mandalay and 55 percent for samples farmers in Magway perceived that their soil is in a good quality.

Resources used in groundnut production consist of family labor, seed, chemical fertilizer, manure, pesticides and insecticides. The major resource of sample groundnut farmers was family labor. Hire labor is used as additional labor. The wage range is from 600 kyats to 2000 kyats per day depending on firm activity in the study areas. Farmers usually prefer if good quality seeds are available because they know it is good for oil contents, high yielding for productivity and lack of seed dormancy due to their groundnut producing experiences. However, one difficulty faced by the

farmers is the high seed cost of groundnut production in the study areas. As a result, they stored groundnut seed for many seasons and planted in their firms.

Furthermore, most groundnut farmers applied the chemical fertilizer and manure fertilizer two times, before planting and after growing. The average amount of 35.5 kilogram per hectare is applied in Magway which is more than in Mandalay. Similarly, finding expressed that pesticides and insecticides application of Mandalay was also inferior to Magway with 26 percent in Mandalay and 56 percent in Magway, respectively.

Information about socio-economic characteristics of household showed that most household had male household heads with the average age of 49 year old in both areas. Most farmers finished the primary school. In average, years in school of Mandalay farmers were about two years more than of Magway farmers. For the groundnut production experience, in average farmers in both areas have experience more than 25 years. Most farmers needed to borrow money to operate groundnut production because they could not manage to pay for the high capital use in their firms. They took credit from the Myanmar agricultural development banks at an interest rate of 1.50 percent per month. Also, some farmers borrowed some cash from the private lenders such as shoppers in the villages, broker-men and crop traders to purchase the inputs for groundnut production in their village. They have to pay it back after harvesting with various interest rates. About 89 and 63 percent of sample farmers in Mandalay and Magway, respectively, have access to credit and the average amount of credit was 10171 kyats/hectare in Mandalay and 8763 kyats/hectare in Magway. Therefore, the rural credit is very important role to groundnut farmers in the study areas.

Firms in the study area had opportunity to access to new technologies through participation in training courses held by the agricultural extension division. Training courses were not organized regularly, the main source of agricultural information were still from newspapers, agricultural journals, television and radio. The results showed that most of farmers in Mandalay (87.29%) and Magway (66.23%) have not received extension service about groundnut production. This showed that agricultural extension services are quite limited in the study area.

After the basic analysis of obtained data, the variables included in the groundnut production function are groundnut production area (ha), amount of chemical fertilizer (kg/ha), labor used (man-day/ha) and two dummy variables for soil quality, good and fair. The variables in the technical inefficiency equation included number of years in school of household heads as representative for the education level, age of household heads, labor force in Man-equivalent unit, and dummy variables for access to credit and access to extension services.

The stochastic frontier production function is based on Cobb-Douglas model. The Maximum Likelihood Estimation (MLE) was used to estimate the stochastic production frontier in Mandalay and Magway, separately. The results showed that in Mandalay, only soil quality is positively related to the yield level with the significant level at 5 percent. The other variables were not significant. There are also technical efficiency effects in the groundnut production function in Mandalay but at the 25 percent of significant level. Hypothesis testing showed that all variables used in the model cannot properly explain the technical inefficiency of groundnut production in Mandalay.

The results of Magway are totally different. The estimation of Cobb-Douglas production function in Magway showed that there are three variables are significantly related to the yield. The size of groundnut production areas is positively significant at 1 percent levels which imply that farmers with larger groundnut farms will have a higher average yield. Even though most of the groundnut farmers in Magway normally practice traditional technology, it seems scale economies in that area. Both dummy variables of good and fair soil quality based on subjective judgment of the farmers are statically significant at 1 percent levels. The indicator of soil quality was positively related to groundnut yield, implying that farmers who have a good or fair soil quality can get higher groundnut productivity than who have bad quality of soil.

In technical inefficiency model, the education variable represented by years in school of household heads was negatively related to technical inefficiency with significant level of 5 percent. This finding indicates that household heads with higher level of education have more efficient in using of scarce resources than ones with lower level of education. The variable of age of household heads is positive and significant at 10 percent level, indicating that younger household heads in Magway

become more efficient than elder farmers. The variable of labor force availability also is positively significant at 5 percent levels, meaning that more use of family labor seems to be inefficient in production of groundnut. The access to credit is negative and significant at 1 percent level, indicating that farmers who had access to credit proved to be more efficient in utilization of resources than who do not have. Access to extension service does not show that it is a significant variable in explaining technical efficiency.

The mean technical efficiency was 89 percent in Mandalay and 73 percent in Magway. This means that by using existing technology in the areas, the technical efficiency of groundnut production can be increased 11 percent for the production in Mandalay and 27 percent in Magway.

6.2 Suggestions

According to the results of frontier production function, the soil quality is quite an important factor to increase the groundnut productivity. Government should have a program to improve the soil quality in the study areas and also have a program to encourage farmers to improve their soil quality such as a special credit program for soil improvement and reduction of rental if farmers invest for soil improvement.

Efficiency in groundnut production systems of the study areas can be raise significantly by providing farmers with greater access to credit. This is necessary to improve access to credit in the study areas. Government need to increase and extend the rural credit programs and ensure that there is adequate credit for groundnut production.

As education is also important for increase of technical efficiency, special education program should be provided to improve farmers' capability in decision-making and management in their production.

Although access to extension service is not significant factor to increase the technical efficiency of groundnut production, government should also consider that why the farmers trained by the agricultural extension department could not improve their production efficiency. It is possible that the extension service and training courses were inefficient. Strengthening extension services should be considered.