CHAPTER 6. SUMMARY, CONCLUSION AND RECOMMENDATION

6.1 Summary

This study centered on examining the credit management and utilization pattern and estimation of marginal effect of credit on farm productivity in rice and soybean cropping systems. Two Stage Switching Regression model was used to make a joint estimation of farm productivity and the likelihood that the farm-households are unconstrained or constrained with credit. Using multi-stage sampling procedure, a survey was conducted across four districts of Chiang Mai Province (Hangdong, San Patong, Chomtong, Doi Tao) where rice and soybean are predominantly cultivated.

The respondents for rice cropping system were either rice-soybean, rice-garlic and rice-onions located in Hangdong, San Patong, and part of Chomtong. For soybean cropping system, were rice-soybean, rice-chili, and soybean mono cropping in Doi Tao, Chomtong and part of Hangdong. Average landholding and cultivated land for rice was 4.65 rai and 6.59 rai per household respectively, while in soybean, it was about 5.17 rai and 8.92 rai per household. Farm income across the four districts vary because of differences in agro-economic condition e.g. land types, fertility etc.

Formal sources of farm-household credit were from BAAC, cooperatives, farmer's association and other commercial banks in the area while the informal sources were village merchant, traders, friends/ neighbors and relatives. Overall, formal and informal sources of credit did not significantly compete with each other. About 75 percent of the farm-household credit needs in the province is served by the formal

source. BAAC captures more than 80 percent of the formal credit market share. Average formal borrowings across crops was about Bht. 9,107.32 per farm for soybean and Bht. 6,585.00 per farm for rice.

Distribution of farm borrowings shows that about 75 percent of soybean farmers would borrow from the banks as opposed to 34 percent for rice farmers. Low interest rate was considered primary motivation influencing formal borrowings. Access to bank's credit campaign and contact with agricultural officer (kaset tambol) were considered as secondary factors.

Primary credit need for farm related activity was cultivation of either rice or soybean crop while secondary credit needs were for poultry, dairy farming and improvement of irrigation facilities and equipment. Those that indicated secondary need for poultry and dairy farming were mostly from Doi Tao or Chomtong, which are basically upland land. Reported non-farm credit needs on the other hand, ranges from consumption (food, medicine, etc.), farm products trading, to house repair and improvement. Amount desired by farmers ranges from Bht. 3,000.00 to Bht. 45,000.00 for farm activities and Bht. 5,000.000 to Bht. 70,000.00 for non-farm activities.

About 80 percent of the formal borrowers have no outstanding debts. Across cropping systems, 68 percent of the farmers pay their loans after harvest. On a per crop basis, rice had the lowest repayment rate and the highest was in soybean. Relative stability of the output price, as in soybean, explains the reason for the differences in loan repayment behavior. Restructuring of loans were commonly negotiated by the farmers with the bank, to get over with indebtedness in case of crop failure.

Extent of formal credit constraint is high among soybean

farmers, about 56 percent. Across districts, Chomtong and Doi Tao have the highest percentage of credit constrained farmers for soybean. Rice credit constrained farmers are mostly from Hangdong and San Patong. Liquidity position of credit constrained household are 33 percent and 38 percent lower than credit unconstrained household for rice and soybean respectively.

Availing of formal credit is also perceived by farmers across cropping systems as an important support in improving production potential of the farm. About 45 percent and 25 percent of the average loan across cropping systems are spent for labor and material inputs respectively. The remaining amount of loan is either use for indirect farm expenses or totally diverted to non-farm household expenditures.

Moreover, assessment of the marginal effect of credit on farm productivity in rice and soybean was done using Two Stage-Switching Regression model. The first stage was using Probit Maximum Likelihood model and the second stage was Generalized Least Squares estimation of the output functions with Cobb-Douglas specification.

The Probit analysis show that for rice, cultivated land and total liquidity, are the most important factors influencing the probability of being credit unconstrained .

These two significant variables for rice are also significant in the soybean Probit estimation. Five other variables are statistically significant in the soybean model. These are : farm income, amount of savings in financial institution, rice-soybean dummy and two interaction variables. The over all Probit result suggest that soybean farmer in rice-soybean systems, which happen to be in Hangdong and San Patong districts, are more likely to be credit unconstrained.

The second stage estimations show that for rice cropping system, land, liquidity and D1 (Hangdong dummy) contribute most to the total farm output of credit unconstrained rice farmers as well as labor and seed. For credit constrained farmers, land, liquidity, labor and stable non farm work (D6) are statistically significant. However, stable non-farm work has decreasing effect on farm output since fungibility of extra income is greater if the households are credit constrained. The significance of rice-soybean system suggests a location specific implication that rice comparably yield lower when following soybean than when it follows onion or garlic. This is apparently due to high residual fertility in the soil as a result of heavy application of fertilizer to the crop prior to rice, which is a common practice.

The separation variable (truncation effect) in the rice model is insignificant statistically across the two output equations meaning they are not bias toward separation from each other. So we conclude that the two functions can be combined as one and that credit utilization of the two regimes for rice are not different.

The soybean output estimation shows that land and labor are significant output determinants for both groups of soybean farmers. If the farmers are not liquidity constrained, the their extra income has a greater tendency to be spent in hiring more labor and buying more inputs than when farmers are constrained.

Aside from land and labor , total liquidity, seed and two dummy variables were also statistically significant in regime 2. Another location specific result here, is the significance of rice-soybean dummy with a negative sign implying a decreasing influence on farm output. Possibly because soybean performs better under a well

drained upland condition than in conventionally irrigated lowland as in Hangdong and San Patong. Seed is also statistically significant only in the credit constrained model. One important reason is that, if the farmer is liquidity (credit) constrained, the quantity of the output he could store as seed is more variable depending on the cash needs at the time of harvest. Unlike if the farmer is not constrained with liquidity where the amount of seed stored at harvest could be less variable.

The significance of total liquidity in the credit constrained regime but with comparably low estimated coefficient, also implies that an excess quantity of this variable is used by the farm-households. The reason behind is that, the fungibility of money is enhanced if farmers are constrained with liquidity. So diversion of money is high and effect on farm output is therefore low.

The truncation effect are statistically significant in both regimes implying a statistical bias toward separation.

The estimated MVP of some important inputs revealed that there is generally an excess allocation of labor and total liquidity to the production process of rice and soybean in the study area. Seed however, is over applied only in basically soybean growing areas as explained by some socio-economic constraints such as size and quality of arable land and cash needs to buy inputs, and others.

6.2 Conclusion and Recommendation

One fundamental constraining issue, that research on farm level impact of agricultural credit has to account, is the wide

range of production, consumption and investment activities undertaken by a farm-household. These range of activities are either related or totally unrelated with farm operation. Given the fungibility of farm-household cash management, credit money that is considered as part of the total liquidity possession of the household, could be subjected to various forms of spending activities. Hence, it is difficult to assess the true impact of loan, supposedly given for farm production, without considering these interrelated credit utilization and management behavior of the farm-household into our analysis.

Analysis of socio-economic profile with farm-household in the two crops (rice and soybean) revealed some important characteristics and indicators, relevant for a systematic understanding of the credit situation in the area. Farmers across crops have an average age of 40 years old. This relatively older age profile maybe due to the influence of the growing employment demand in Chiang Mai which easily attracts the younger labor force to work in off-farm jobs in the city.

On the average more farmers are renting at least 2 rai of land aside from what they actually own in both crops. This behavior reflects the importance of land in increasing farm household return per unit of time. Land was mostly used as loan collateral hence, landholding also assures credit money availability of the farm-household.

Assessment on the fungibility of credit money across cropping systems have shown that about 75 percent of the loan value is directly spent for farm operation e. g. labor and material cost. Extent of credit constraint also shows that at least 35 percent are credit constraint. The highest percentage of credit constraint farmers is in soybean. Yet another empirical evidence from this study, show that a

higher percentage of credit constrained farmers are from the relatively poor districts of Chomtong and Doi Tao.

From these patterns of credit utilization behavior of the farm-households in the study area, it should be pointed out that in extending credit assistance especially to those liquidity (credit) constrained farmers, we should take note that if there are liquidity demands for consumption and investment, there will be a strong demand to divert fungible loans to these purposes. The greater the fungibility of formal loans and the lower their interest rate relative to alternative sources, the more valuable will be and the more likely will be the diversion of funds. This implies that lowering of interest rate, to stimulate formal borrowings, is not always compatible with the objective of increasing farm output, if such is the situation.

In the face of overutilization of inputs, particularly labor, using of new technology can really make significant impact to improve the situation, for the following reasons ; Prices of rice and soybean are about normal. Which means that it did not go considerably lower than the average over 3 to 5 years in order to stimulate a short run reduction in input use. In the case of rice also, even if the output price will decrease, reduction in input use could still be less significant. Presumably because of the relatively fixed quantity of labor available at the farm-household which does not purely respond to price but to other cultural and traditional factors as well. The consumption-oriented cultivation also for rice is another consideration. Even if the price of output decrease, the farmers would still use the same quantity of labor in order to secure their need for food.

Moreover, it is evident from the result that reallocation of

overutilized inputs or introduction of new technology is more urgent than increasing the average amount of credit currently being granted to the farmers in these two crops. However, credit assistance can be expanded by increasing the loan coverage in terms of the number of borrowers and/or providing loan assistance to other services beside farming.

From the above conclusion, it is hoped that these findings could provide some valuable inputs for a systematic understanding of the rural credit situation in Chiang Mai Province. However, it should be emphasized that to finally utilize the results and implication of this study, the following comments and research limitations should be considered ;

i) The study considered only two of the major crops in Chiang Mai province covered by short-term agricultural credit program of the government. A more holistic implication, relative to the scope of the credit program, can be generated if the study is expanded to other major crops such as; vegetables, annual fruits and others , because their borrowing patterns and liquidity requirement could be quite different.

ii) Due to some data research logistic limitations, the scope of the analysis is not able to clarify the impact of technology in the system. Further studies should consider how differences in technology could affect credit utilization pattern.

iii) The labor variable in the output equation which consist of cash and non-cash labor was imputed equally using the average wage rate in the area. Maybe a better estimation result can be generated if we take into account differences in quality and duration of work perform by the members of the farm-household.