CHAPTER VII

CONCLUSION AND RECOMMENATIONS

7.1 Conclusion

The objectives of this study are to determine variation in yields, prices, cost, income, and gross margin of different rice varieties in the past 6 years in the study area. Coefficients of variation are used to represent levels of risks. Coefficient variations are used for risk evaluation of yield, price, cost, income, and gross margin for each rice variety. Furthermore simple regression is used for trend analysis. Trend of market price was under taken for the period of 15 years and for government support price, 8 years trend was under taken. For yield, 6 years trend was analysed.

MOTAD (Minimization of Total Absolute Deviation) and linear programming were employed in this study as the major analytical tools to derive the optimal farm plans for rice for farmers using market and government support prices. Two land types: rainfed and irrigated area are considered. Capital constraints take the forms of owned fund and credit available. Formulation of MOTAD model was accomplished by using 6 years of historical product prices, yield, and cost data to the base linear programming. Rice crops considered in this study are selected from the feasible rice crops that were planted in the study area. Rice varieties, namely KDML105, RD15, and RD6 were taken into account.

The result of risk analysis shows that under government support price RD15 and KDML105 have lower risks than under market price. RD6 has the lowest risks under government support price and market price as well as yield risk. KDML105 has the highest risk under government support price and market price. RD15 has the highest yield risk.

In rainfed areas, cost risks are lower than in irrigated area. RD15 cost risk is the highest in both rainfed area and irrigated area. RD6 has the lowest cost risk.

However under market price, gross margin risk for RD6 is the highest risk in both rainfed area and irrigated area. Under government support price, RD15 has the highest gross margin risk in both rainfed area and irrigated area. KDML105 has the lowest gross margin risk under market price in both rainfed area and irrigated area.

Using simple regression for trend analysis, KDML105 has the highest rate of increase in market price and also government support price. RD6 has the lowest rate of increase in market price and also government support price. Trend analysis in rice yield does not demonstrate any increase.

The solutions of this MOTAD model are the minimum risk farm plans corresponding to maximum gross margin. This study indicated that under market price and government support price, KDML105 is more suitable for high risk averse farmers because gross margin risk of KDML105 was the lowest. Risk neutral farmers should grow more diversified farming devoted area to both RD15 and KDML105. Under market price, farmers with low risk aversion (risk taking) should produce RD15 and RD6 but under government support price, farmers should produce KDML105 and RD6. In rainfed area, farmers with high risk aversion should produce mainly KDML105 and RD6. Contrary to common beliefs, this study shows that KDML105 is suitable to risk averse farmers while RD15 is perhaps more suitable to risk taking farmers. In term of expected gross margin, model under government support price is more than under market price while risks are quite similar. Considering mix model under market price and under government support price, expected gross margin is lower however risks also are decreased.

The empirical result indicated that the diversification crop reduces risk but also gross margin. The farm plan which has the high gross margin and risk will be suitable for risk neutral farmer. Farm plans with more diversified crops are more suitable for risk aversion farmers.

Sensitivity analysis was tested to see the stability of the model by changing rice prices. It was found that when prices increased, farmers have higher gross margin and also higher risks when compared to base model. As prices changed, the

combinations of rice varieties will be changed. Under market price and government support price program, more land is allocated to KDML105 and less to RD15.

7.2 Limitation of the study

There are some limitations that affect to the results in this study. Some of them are listed below:

1. Statistics on yield, price, income, and cost for rice crops were not divided to rainfed and irrigated data. The revenue deviations are necessary for the models to capture risks associated with alternative crops. Some of these secondary data are not available. Rainfed models and irrigated models used in this study are constructed by estimating price, yield, income and costs at base year. The results might be different if revenue deviations in rainfed and irrigated area are available.

2. In fact, there are many rice varieties that some farmers would like to produce but data of another rice variety in some years are missing. The results will be change and give more option for farmers if there are many rice varieties in the model.

7.3 Recommendations for further study

1. Further use of geographic information systems (GIS) can be incooperated with linear programming model so as to provide land management unit and spatial land allocation analysis of the study area. This type of analysis will be more suitable and useful for farmers in the study area.

2. In this study, three major rice varieties were considered for Phayao province. There are other minor rice varieties that could be considered in the model and can give the new combinations of rice crops. Further research can add other minor crops in the model. Farmers' income opportunity may be increased by adding new combinations of rice crops.