

CHAPTER IX

CONCLUSION AND RECOMMENDATION

9.1 Conclusion

Three places that represent typical rice farming systems for three major rice growing agro-ecological zones were selected to carry out this study. The results generated from each of the study sites are therefore more or less applicable to that particular agro-ecological zone. Policy Analysis Matrix (PAM) framework was used as the tool of analysis for this study with the hope that using such a model would help in communicating the results easily to the policy makers.

Rice cultivation in Bhutan is a labour intensive enterprise while labour shortage has been reported in a number of studies. The labour requirement differs from one region to another and Lobesa reported to the highest number of labour days required at 200 per hectare. Men and women equally participate in paddy cultivation with the gendered division based on the physical strength required to carry out an activity. The wage rates prevalent in the villages closer to the urban centers are above the wage rate that would be normally paid to the National Work Force (NWF). The high labour requirement coupled with the high wage rate has made rice cultivation in Bhutan an expensive affair.

The mode of land preparation is still traditional using bullocks in most places though the use of power tillers has been adopted well in Paro. Only a few farmers in Lobesa reported to using power tillers while no farmer in Samtse owns a power tiller even though the terrain is suitable to mechanization using small machines.

Though inorganic fertilizers are used, farmers still prefer to use FYM to supplement the nutritional requirement of the soil. Farmers reported difficulties in

tilling the land with continuous application of inorganic fertilizers especially urea. Therefore, farmers use huge quantity of FYM to make tilling easier.

Looking into the yield, Lobesa representing the dry sub-tropical region had the highest average yield of 5.16 t/hectare, closely followed by Paro with 5.02 t/ha. Samtse on the other hand had the lowest yield with 2.23 t/ha. Low yield in Samtse can be attributed to the unavailability of higher yielding modern varieties, lack of proper irrigation and crop damage by wild animals.

Both traditional and modern varieties were grown in all the three locations. Though the yield of the modern varieties was higher than the traditional varieties, farmers still grew traditional varieties. In Samtse, the reason for growing traditional varieties could be due to the unavailability of modern varieties, higher price for the traditional varieties, and better eating quality. In the dry sub-tropical and the warm temperate zones, the reasons for the cultivation of traditional varieties can be attributed to the higher price for local varieties, socio and religious activities, value addition, and above all the traditional varieties are highly adaptable and suitable in the traditional farming systems.

Returns to land were positive in all the three locations though the returns to labour was lower than the prevailing wage rate in Samtse. Cost of production for milled rice was highest in Samtse and lowest in Lobesa. However, not much difference in production cost was observed between Lobesa and Paro. Low yield was the main factor for the high production cost in Samtse.

Rice was socially profitable in all the three locations. It was lowest in Samtse (Nu.669.4/ha) and highest in Lobesa (Nu.21241.8/ha). The social output price was lower than the private price in Samtse while it was higher in Lobesa and Paro. The lower private price shows that farmers are being taxed for their output while higher private price denotes a case of subsidy from the government. However, it can be said that the private price was lower in Samtse because of easy access to the Indian

markets and farmers there have to compete with the Indian farmers. On the other hand, farmers in Lobesa and Paro are enjoying substantial subsidy from the society.

Though the government does not have any policy of providing subsidy for fertilizers and weedicides, it provides free transportation to have a uniform price throughout the country. The government also pays a 10 percent commission to the CAs on the value of the inputs sold. This is a subsidy and the NPI has clearly reflected the case in all the three locations. Farmer further away from the main port and who use more inorganic fertilizers enjoy more subsidy than the ones closer to the port and the ones who use less of those inputs. However, the policy of the government in keeping the price for inputs uniform throughout the country has favoured rice farmers in all the three locations. This is evident from the positive net transfers.

All the three locations are competitive in rice production, though a slight increase in the price of fertilizers or a decrease in the f.o.b. would lead to a situation of low competitiveness in Samtse. The DRC of Samtse is close to unity and even a slight increase in the opportunity cost of labour would make rice production in Samtse uncompetitive and further engagement in this enterprise would only be a waste of resources. Samtse would save domestic resources through import of rice rather than producing at home in case of a decline in the f.o.b. price. However, Paro and Lobesa would still be able to retain its competitiveness if there were to be some slight decrease in yield. Based on the production cost, Bhutan would not have comparative advantage, as the world price per unit of output is lower than the per unit production cost in Bhutan

However, when compared to social price of Indian rice, the picture is entirely different. These three locations would have negative social benefit and comparative disadvantage. In order to be able to at least competitive with the Indian rice the rice production in Samtse representing the wet sub-tropical zone would have to increase by almost 50 percent while in the dry sub-tropical and the warm temperate zones, the yield would have to increase by approximately 23 percent.

Though the Policy Analysis Matrix (PAM) framework has been used for this study it has its own strengths and weakness. The strength of the PAM is the disaggregation of supply in terms of technology and agro-climatic zone. Such disaggregation permits a detailed understanding of constraints on systems and provides a basis for the analysis of investment and technological change influencing the dynamic comparative advantage of agricultural systems. The principal weakness of the PAM approach is that empirical applications may not correctly specify all the marginal adjustments to alterations in output and input prices (Monke and Pearson, 1989).

9.2 Recommendations

9.2.1 Policy recommendations

1. Paddy cultivation is highly labour intensive and the use of small farm machines can reduce the drudgery faced by the Bhutanese farmers. The distribution of farm machines if carried out in accordance to the area's potential in using the machines efficiently would have better impact on rice production. Priority should be given to those areas where the terrain is more suitable for machine use if Bhutan is to attain increased paddy production.

2. The production cost of paddy in Bhutan is high and ways of reducing the production cost should be sought. While searching for the means to cultivate rice at a lesser cost, an increase in productivity is necessary to reduce unit cost of production. Hence, research should focus to improve the efficiency of resources use in rice production and thereby improve the competitiveness.

3. The wet sub-tropical zone accounts to almost 40 percent of the country's total wetland. The use of resources in rice production would not be efficient unless the situation of rice productivity in this zone is improved. If yield situation remains the same as it is at present then farmers should have the choice to make the best use of

their available land and this would call for some modifications in the Land Act, 1979 especially with regards to the clause on land conversion. Therefore, priority in terms of construction of new irrigation canals and the renovation of the existing ones coupled with the promotion of higher yielding varieties through the adoption of improved technological packages and cropping system would boost rice production in the area. It would immensely support the government's goal of 60 percent self-sufficiency in rice.

4. Agro-ecological zone specific policies and strategies to increase rice productivity should be developed. Such strategies should be based on previous successes and best practices, taking into consideration new opportunities relevant to prevailing challenges as well as lessons learned from previous successful endeavours. Strategies must also recognize and accommodate the individual characteristics of various rice based production and livelihood systems, as expressed through their agro-biological, technological and socio-economic features.

5. The analysis of DRC has shown that all the three locations representing the different rice growing agro-ecological zones have comparative advantage in rice production when the import parity price is used. Even though the world price is low, the total cost involved in importing rice would be high and therefore would be cheaper to produce rice in the country itself. Expansion and intensification of rice production can be boosted but the internal marketing mechanism beyond the present sale of rice directly by farmers in Sunday market would need to be established. Agencies to facilitate internal marketing of rice need to be identified for the distribution of domestically grown rice from surplus areas to deficit areas.

6. If Bhutan is to achieve 60 percent self-sufficiency in rice, then the future growth in rice import especially from India should not increase dramatically. There is a need to work towards increasing productivity per unit area and bringing down the production cost so that the country can depend less on imports.

7. Women are equally or more involved in paddy production than men. Farmers' training on better production practices and management should be focused on women for better results.

8. Different organizations have different data sets. The area under paddy cultivation as reported by Land Use Planning Project (LUPP), the Department of Planning, and the RNR Census are all different. Proper data sets are required in order to carry out sound planning. There is therefore a need to have proper and reliable data sets.

9.2.2 Recommendation for further studies

One of the shortcomings of this study is that the cost of irrigation has not been included. The study also focused only on rice between three different agro-ecological zones therefore showing the competitiveness, profitability and effect of policy transfers among the three different regions only. This however, does not permit comparison with other commodities. Therefore, it is highly recommended that further studies incorporating a number of commodities for different regions of the country be carried out to guide policy decisions.