CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions on economic impacts

The objectives of this study are to examine the economic impacts of golden brown dried longan processing operations of community enterprises on community's income and employment as well as on the forward and backward linkages of GDL output, and study the environmental impacts of the improved production technology by comparing the efficiency between conventional technology and improved technology, so as to use the findings to formulate a proposed plan for further development of GDL processing community enterprises.

The findings indicate that the operations of GDL processing community enterprises generated the strongest positive economic impacts, compared to other economic sectors, on the general local economic growth and the raw material backward linkage. Specifically, the GDL sector attained the highest level of value addition at 56.07 million baht which comprised 23.25 million baht employment of off-farm wage labors, 14.62 million baht self-employment of household labors, and 18.20 million baht producer/entrepreneur saving or profit; the highest output value at 164.54 million baht of output value which consisted 116.71 million baht output export to external markets and 43.83 million baht sale to local traders and community enterprises' network; and the largest value of 2.80 for its backward linkage effect on raw material usage. Among various sectors under investigation, the most important in terms of backward linkage effect on input factors after the GDL

sector were teak lamp production, teak furniture production, longan production, and rice production. The strongest backward linkage impacts of GDL sector were meaningful directly for the fresh longan, off-farm daily wage labors, household labors, and fuel stations sectors and indirectly for the off-farm daily wage labors, household labors, agricultural chemical store, and grocery stores sectors.

Meanwhile, the strongest forward linkage effect was found in the rice mills sector with the value of 3.81 followed by agro-chemical supply stores (3.80), drinking water and water supply (3.79), grocery stores (3.66), and market fairs (3.57) sectors, respectively. The GDL sector appeared to have the lowest value of 1.94 meaning the very small extent of the use of GDL as raw material in other production sectors.

The sector that had the greatest income backward linkage impact was the teak lamp with the value of 0.62, followed by garage (0.61), GDL processing (0.61), rice production (0.58), teak furniture (0.58), and longan production (0.56), respectively. Meanwhile, the sector having the largest income forward linkage impact was rice production with the value of 1.28 followed by garage (1.14), teak lamp (1.04), teak furniture (1.03), and longan production (0.96), respectively. In terms of backward linkage effect on employment, the rice sector had the highest value of 0.19 followed by GDL sector (0.18). Similarly, the rice sector had the highest forward linkage impact on employment with the value of 0.56 while the figure for GDL sector was 0.28.

The study on economic impacts of various production sectors in Tambon Makhuea Chae revealed the findings in essence that the most important sector generating great local impacts was the GDL especially on its backward linkages in terms of raw material and factor input usage. Furthermore, the GDL sector was found to have the highest value addition and the highest absolute output value compared to any other local economic sectors. Rice mills sector appeared to create the largest forward linkage value while the teak lamp sector generated the largest income backward linkage because of its usage of many factor inputs. The most predominant agricultural sectors were identified to be those of rice cultivation and longan production for their significant employment and income generation. Therefore, any policy and financial supports for encouraging production expansion of the important economic sectors addressed above will have the positive bearings on the local economy in terms of more extensive use of factor inputs, more labor employment, as well as higher income for various farm, firm, household and institutional units.

7.2 The results of CGE model simulation

The CGE model was employed for the analysis of policy impacts especially from the minimum wage and budget allocation perspectives on the GDL sector in particular and the local economy in general under different scenarios (A-E) as following: Under the Scenario A, given the increase in minimum wage rate to 300 baht per day or the increase in labor income by 27 %, all economic sectors will be negatively affected particularly directly on the income of daily farm labors, daily off-farm labors, and monthly off-farm labors. Esspecially, the 27 % increase in labor cost will become the burden of producing firms and in case the firms have no savings for

investment or the government has no measure to alleviate this cost burden, then all sectors will cut down their production by 19.4 % on the average (A1). In case where all firms can manage to shoulder the cost burden and maintain the existing employment levels, the GDL sector will grow at the rate of 7.6 %, and all sectors on the average will grow at 3.3 % rate (A2).

In case the intermediate input cost of GDL processors increases which means that the firms have to face higher production cost, the growth rates of all other sectors will become lower and the GDL sector will decrease. Specifically, if the intermediate input cost of GDL processors increases by 20 %, the GDL sector will cut down by 6.9 % while other sectors will have the decrease in average growth rate by 5.2 % (B1). With the 40 % increase in this cost, the GDL sector will cut down by 10.8 % while the others will have the decrease in average growth rate by 8.1 % (B2). If this cost increases by 60 %, the GDL sector will cut down by 13.2 % while the others will face the reduction in growth rate on the average by 9.9 % (B3).

Under the condition that the government implements the National Village and Urban Community Scheme by increasing capital fund to various Tambons' economic system through local village funds or community enterprise groups, the local production activities will be affected and the CGE model calculations were made under 5 different scenarios. If the existing village fund is enlarged by 20 %, all economic sectors will grow averagely by 11.1 % (C1) and the GDL sector itself will grow by 20.3 %. If the existing village fund gets an extra 40 % money supply, all sectors will grow by 19.5 % on the average (C2) while the GDL sector will grow by 34.4 %. In case the existing village fund is enlarged by 60 %, all sectors on the average will grow by 26.2 % (C3) and the GDL sector will grow by 44.7 %. When the

size of existing village fund increases by 80 %, all sectors grow averagely by 31.7 % (C4) and the GDL sector will grow by 52.8 %. If the existing village fund is enlarged by 100 %, all economic sectors will grow on the average by 36.4 % (C5) and the GDL sector in particular will grow as much as by 59.2 %.

In the case the government allocates the fund directly to the GDL community enterprises, the policy impacts will be greater than its allocation through village funds or general community enterprises group. If the GDL sector receives direct government financial support to enlarge its capital fund by 20 %, all economic sectors will grow by 20.5 % on the average (D1) and itself will grow by 67.7 %. If the GDL sector gets 40 % more of its capital fund directly from the government, it will grow by 131.8 % while all sectors will grow by 37.1 % on the average (D2). In case of its capital fund increases by 60 %, the GDL sector will expand by 193.7 % and all sectors will averagely experience 51.1 % growth (D3). When its capital fund increases by 80 %, the GDL sector will attain 254.2 % growth while all sectors on the average will grow by 63.5 % (D4). If the GDL sector gets direct government's injection of money at 100% of its capital fund, it will grow by 313.6 % and all sectors averagely will attain 74.6 % growth (D5).

Since the allocation of government budget to such local government as Tambon Makhuea Chae Municipality Office will also affect the local economy, the present study calculated the outcomes of budget allocation under 5 scenarios. In the case the Municipality Office receives 20 % greater budget for its spending, all local economic sectors on the average will grow by 4.7 % while the GDL sector in particular will grow by 9.6 % (E1). If its budget size increases by 40 %, all sectors will expand averagely by 9.5 % while the GDL sector will grow by 19.4 % (E2). If the spending

budget for the Municipality Office is enlarged by 60 %, the overall local economy will grow by 14.5 % while the GDL sector will expand 29.4 % more (E3). In the case the Municipality Office gets 80% more of budget for its spending, all economic sectors in Tambon Makhuea Chae on the average will grow by 19.6 % and the GDL sector will attain 39.7 % growth (E4). Meanwhile, the 100 % increase in budget allocated to the Municipality Office will enable the expansion of overall local economy by 24.8 % and the growth of GDL sector in particular by 50.3 % (E5).

Under the condition that the government has a unit of money to be injected into a local economy either through the private sector like the GDL sector or the public sector represented by the Municipality Office both in our case, the findings from the present study provide the implication that the supply of more money to such government line agency as the Municipality Office will enable the growth of all local economic sector including the GDL, but the supply of the same amount of money directly to the GDL sector will enhance its growth to a much greater extent compared to the effect of public spending. Specifically, the efficacy of policy to promote community enterprises or national village and urban fund operations is greater than that of fiscal policy administrated through government agencies, and of course in the case of GDL economy the policy on direct support to producers/firms is more effective than that on indirect support through the functioning of Municipality Office, Cooperative and Savings groups, community enterprises and their network, or other occupational groups.

7.3 Impacts of improved technology

The present investigation found that the improved technology which incorporates the elements of insulating material to replace galvanized iron as oven walls, cavity door to prevent heat dissipation, and thermostat to regulate temperature in longan drying oven is more efficient than the conventional technology on the basis of 1.000 and 0.939 of Meta-frontier efficiency scores, respectively. This is supported by the findings that the technical efficiency of producers' group using improved oven was higher at statistically significant level than that of group using conventional oven. The results from meta-frontier analysis revealed the existence of quite small efficiency gap between the conventional technology and the improved technology. However, it was found that the input use efficiency of the improved technology group was relatively higher at statistically significant level in terms of fuel wood, labor, and electricity expense.

In other words, the average economic returns of improved users have higher than that of conventional oven users 2,460.60 baht per oven. The change to improved technology will involve an investment of 27,050 baht per oven for modification works and this investment has about 116 days' payback period. If all GDL processors under this study adopt the use of improved ovens, a combined cost saving of 71,370 baht per day per 305 ovens as well as a total reduction of carbon dioxide emissions by 100 tons per day will be realized. It thus becomes imperative that supports be provided to encourage the investment for improving/modifying the longan drying ovens through such means as low interest loan or government subsidy for the modification works because the improved technology not only enhances the technical efficiency of GDL

processors but also helps reduce their production cost from lower fuel wood consumption and lower the extent of carbon dioxide emissions to the atmosphere.

7.4 Policy recommendations

1) The government should find the measures to assist the SMEs or community enterprises groups which will be affected by the increase in minimum daily wage rate to 300 baht because most rural enterprises are weak and poor in terms of available capital fund from their own savings, access to low interest formal credit source, apart from their other problems and constraints. In case these community enterprises cannot shoulder the higher labor cost burden, they might cut down their production volume or eventually shut down their operations which will adversely affected the laid off workers.

2) The government should promote savings among people in labor group by establishing a social welfare program for their retirement or old age security in the long run probably by the labor's setting aside part of the increased wage for self-insurance of welfare and security after his retirement.

3) The measures to assist the SMEs or community enterprises groups which will be affected by the increase in minimum daily wage rate should be in terms of government subsidy or support for the producers/firms channeled through the community enterprises groups or the National Village and Urban Fund Scheme rather than through government line agencies for the reason of effectiveness.

4) To help develop and improve technology for greater efficiency to replace the scarce laborers and deal with the higher wage cost, the government must provide supports for researches on machinery for peeling and pitting longan fruits which is

more efficient than manual method and should ensure that the cost of machinery investment will not be too high for the financially poor small processors to afford.

5) Government agencies should provide supports in terms of training to improve labor productivity or knowledge on how to change or adapt production technology like the modification of longan drying oven's features to attain greater efficiency from the ability to minimize energy and labor costs.

7.5 Strategies for the development of GDL community enterprises in Tambon Makhuea Chae

To foster local labor employment, increased income, and use of raw material in longan production sector as the result of GDL processing community enterprises' operations, the local government should assist these community enterprises to enable them to improve their production technology by providing supports for researches on and development of peeling and pitting tools to deal with labor shortage problem, with the following details.

It should provide supports for GDL processors to improve their production technology through the modification of conventional drying ovens by replacing the galvanized iron with insulating material as oven walls to reduce fuel consumption, installing cavity door to prevent heat dissipation, and adding a thermostat to regulate temperature. Since the modification works will involve 27,050 baht cost per oven, the local government to its capacity can find interest-free loans for the processors to make their investment on improving the ovens or find loans for them to use as working capital. Supports should also be provided for researches on efficient but low cost peeling and pitting tools for GDL processors to use in dealing

with peeling and pitting labor shortage problem. Furthermore, the local government should promote GDL as products based on local knowledge by organizing annual GDL Day to make local longan growers and processors become more aware of the importance of processed farm outputs as well as to make GDL products of the community enterprises known to the public to a wider extent.

7.6 Recommendations for further studies

1) The present study covered the whole Tambon Makhuea Chae in Mueang District of Lamphun Province which is the major area of GDL production. However, this Tambon has rather large geographic coverage including 21 villages and 4,075 households and thus posing difficulty in data collection process. Future studies should be confined to a relatively small geographic area to enable a more comprehensive data and information compilation.

2) There were only four GDL processing groups using improved ovens for the present investigation on the impacts of improved technology but the number is growing every year. Future studies with the same methodology should be encouraged as more samples can be incorporated for the analysis.

3) Studies on economic impacts or external impacts should be conducted at the micro level, for example, study on the economic impacts of Northern Industrial Estate in Lamphun Province to obtain findings that can be suitable and useful for policy recommendations and for industrial development, or study on impacts from tourism activities in Pai District of Mae Hong Son Province.