

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Country's principal vegetables and flowers growing area of Pyin Oo Lwin township was conducted as study area in 2010. Most farmers in the sampled group were male 87.9 per cent and the average age of farmer was 40.5 years. Regarding farmers' education, only 4.1 per cent were graduated from the University. Most of the farmers could be characterized as small scale farmers. About 56.4 per cent of the farmers held the agricultural areas from 0.4 to one hectare. The total farmers had grown vegetables and flowers as the main career. Most of these farmers gained the annual income in the range of Kyats 100,000- 4,000,000 (80.6 per cent) of the sampled respondents. About 42 per cent of the farmers had experience in growing crops for 10- 20 years and in using chemicals as well. In respect of information receipt, most of them (86 per cent) received it form chemical agents.

According to the study on farmers' behavior towards the use of pesticides in growing vegetables and flowers, details of their behaviors were as follows:

More than half of the farmers (60 per cent) read the instructions that included in the pesticides containers. About 60.4 per cent of the farmers used all amount of pesticides that instructed in the package. About 19 per cent used extra amounts because they believed over dosage would be more effective to control the pests and diseases. 63 per cent of the farmers in the sampled sprayed pesticides

whether pests attack or not. The farmers did not wait until a certain pest had been identified, but sprayed as preventive measures, before there was any visible damage to crops by pests. Overall, 3 per cent of the respondents used their bare hands to stir for diluting pesticide. However over 74 per cent used bamboo sticks and 21 per cent mixed pesticides directly to the sprayer which had been shaken before spraying began. About 82 per cent of the respondents sprayed their crop by themselves and only 18 per cent used the hired labor for spraying pesticides.

About 33 per cent of the farmers never followed the recommended rate in the pesticides containers while 67 per cent of the respondents used recommended rate of pesticides. 49 per cent of the farmers stored chemicals near their house (outside the house), while 32 per cent stored pesticides inside their house that practice would increase the risk of accidental poisoning by family members. Half of the respondents (51 per cent) destroyed the empty pesticides containers by burying or burning.

Farmers were aware of the standard safety precautions to prevent exposure during spraying. About 92 per cent of the farmers avoided having food during spraying and 90.9 per cent of the farmers having a bath after spraying. Around 50 per cent of the farmers avoided talking and wore mouth cover. 51 per cent of the farmers sprayed according to the wind direction but the rest did not. Only 42 per cent of the respondents wore protective clothing during spraying pesticides. A few farmers (5 per cent) had a good awareness on drinking milk after using pesticides to relief from chemical residue inside their bodies.

According to the first Tobit regression model, the components such as wealth and extension contact, community support, commercialization and education including contextual variables were significantly correlated with awareness index of

the farmers on harmful effects of pesticides. In second model experience, commercialization and education and awareness components were also significantly related with behavioral index of the farmers on using pesticides practices. Awareness of the farmers also influenced their behavior on using pesticide. Therefore, awareness of the farmers plays an essential role in expressing the farming practices.

The cold season vegetables such as kale, cabbage, cauliflower, etc are very susceptible to pest and diseases attacks due to warm and humid climate conditions. In addition monoculture and the used of hybrids varieties demand more fertilizers and pesticides consequently. The intensive used of pesticide was contributing a lot for environmental pollution and hazard to human health. However, not much research had been conducted for harmful effects of pesticides in vegetable and flower growing areas.

Our findings highlight the excessive use of pesticides on vegetables and the reliance on pesticides was the only pest management strategy. Many smallholders reported that they increased their use of pesticides over the past years. In addition 34.5 per cent of the samples reported experiencing health problems because of pesticides used.

Findings from this study indicated that the small holder vegetable and flower growers were weak in appropriate knowledge on safe handling and using of pesticides. This was attributed to by almost absence of extension services and training. This information can be used to develop a training programme on pest management especially on pesticides use in agriculture.

7.2 Policy Recommendations

To be summarized, the following points appear to be considered and implement for the safe and less use of pesticides and to improve the awareness on harmful effects of pesticides.

- 1) Related officials and agencies should provide some knowledge to farmers by setting up the training with respect to correct uses of chemicals for safety of both farmers and surroundings. There should be some documents distributed to farmers or simple communicative posters expressing the content relating to the right use of chemicals. Because it was found that most of the farmers had still wrong behave towards the use of pesticides such as using the amount of chemicals exceeding the recommended amount, still using bare hands to mix chemicals, dressing improperly by not covering all body parts, standing in the wrong position while spraying and storing the chemical containers in their house. These farmers did not pay attention whether those actions will take bad effect to themselves. In addition, it was found that most of the farmers still had wrong practice and they did not have the awareness of danger affecting the society and environment.
- 2) Knowledge or information about pesticides in all aspects should be released to the youth by putting it in related school curriculum to create the youth's awareness since the first step and the youth shall be the important part to encourage their families that have used chemicals to have knowledge and awareness of harmful effects caused by using pesticides

and to have correct and careful use not to affect themselves and the environment.

- 3) The extension service should provide technical assistance to producers and agro-chemical suppliers because GAP and Integrated Pest Management (IPM) are able to reduce chemical hazards.
- 4) Training programme should be carried out to improve extension worker's knowledge because of the limited knowledge of some extension workers on safe produce.
- 5) Some training should be promoted to small-scale farmers for the identification of pests, natural enemies, basic ecology and integrated pest management strategies to ensure sustainable, safe vegetable and flower production.
- 6) Pesticides issues will only improve if the population is better educated/trained on the fundamental principle of pesticides use and safety measures. Therefore, a combination of pesticides regulatory policies, programs to raise farmers' awareness of the harmful effects of pesticides, and a commitment to promote IPM practices by government as well as NGOs may safeguard poor farmers in their pursuit of increased agricultural production and a resulting increase in income and standard of living.
- 7) No matter how the scientists try to work on a lot of researches for environment and natural resource management, the awareness and behaviors of the farmers are the most important as they are direct resource user and their actions directly affects the environment. So it is very

important to upgrade and the government should take a serious consideration for this issue as a political context.

- 8) Pesticides management and calls for the better co-operation with farmers to develop the organic farming activities should be practiced for clean and sustainable agriculture.

7.3 Recommendations for further studies

- 1) For further study, qualitative study relating to the person employed for pesticides spraying should be conducted because these persons always take risks of danger caused by pesticides and they have to touch pesticides directly. Therefore, the issues relating to these sprayers' health is an interesting one for further study.

- 2) The analysis for the maximum residue limits (MRL) in vegetables should be conducted in the vegetables growing areas to reduce the cost of health caused by pesticides residues.

- 3) Impact by the use of pesticides affecting the environment such as soil, water and air in the areas where pesticides have been used should be studied to gain the information confirming disadvantages of using pesticides.