

## CHAPTER VI

### DISCUSSIONS

According to the sampled (165) surveyed households in the study area, most of the cropping activities were concerted the whole year and almost all of the households rely on spring, well and streams. The surveyed households grew multiple and rotational cropping with vegetables and flowers (76 per cent) and only vegetables growing (33 per cent).

Pesticides played an essential role in food production among small farmers in the study area. However, it is important for the health and safety of regional food production that farmers made aware of the high toxicity associated with the incorrect handling of pesticides products for themselves, the consumers and the environment. In Myanmar, farmers were allowed to purchase pesticide products, without restriction and without prior knowledge of proper use.

In this study area, the people were still working even when they are 76 years old and therefore the old people were not mostly put in the dependent list. It can be assumed that the farmers from extended families were much more aware because they could have much more information exposure to outside.

Some farmers did not read the instructions so the problems identified in this study were that the product label information perceived by farmers as too technical and difficult to understand, the font used was too small and the amount of information displayed was perceived as too large.

This study showed that farmers typically sprayed against several pests, and as precautionary measures. This was probably due to the lack of extension services that could offer appropriate advice. Such heavy use of pesticides may result in frequent contact with pesticides, which can lead to significant health problem. A common belief among farmers was the more often one applies pesticides, the better results one gets. Products were often sprayed just before or just after harvest because of the belief that this strategy would conserve vegetables until delivery to the market. This failure to observe the minimum intervals between pesticide application and sale must pose risks to public health.

The farmers used more pesticides because they based the applications on calendar spray pesticides programme without necessarily giving much priority to health and environmental considerations. Rather than deciding to apply pesticides when the presence of a pest or damaged symptoms has been observed or on a weekly or calendar spray schedule, farmers need better guidance to reduce the risks of pesticide residues, pest resistance, pest resurgence and adverse effects on natural enemies.

Also, farmers' awareness on the harmful effects of pesticides was not very strong. As revealed in this study, they find that beneficial effects out weight any harmful ones. Therefore, a priority policy option should be to utilize the existing agricultural extension network including those operated by NGOs, to incorporate awareness training on the harmful effects of pesticide use and to train farmers in proper handling and management practices. This will reduce the adverse effects of increased pesticides use as a result of increased adoption of modern agricultural technology and/ or diversified cropping systems. Currently, the trust of the existing

agricultural extension networks is to promote modern technology adoption and to use of modern inputs (such as chemical fertilizer, irrigation, and pesticides) with no emphasis on harmful impacts.

In this study, even when a farmer was aware of the risks associated with pesticides use and wants to wear protective gear, he does not have access to it: protective clothing is often very expensive and not appropriate to the climatic conditions. The economic rationality of believing that economic risk was more important than health risk. It was one of the main reasons for the poor awareness of preventive measures among farmers in developing countries. An educated individual may know the health and environmental impacts due to pesticide use, but would not be aware of wearing protective clothing due to either poor economic conditions or hot climates.

Furthermore, there were very weak institutions for regulating pesticides use and sales, weak dissemination networks and weak political determination. Owing to such factors, farmers do not take account of sustainability of pesticides use and ignore costs of pesticides pollution. Pesticides were easily available in local market because of lack of implementation of pesticides rules and regulations, unwillingness to risk economic losses due to poor economic conditions and low share of pesticides on total produce due to cheap price of pesticides further exacerbate the situation.

Pesticides usage in the study area seems to be highly influenced by pesticides vendors who were carrying out their business right in the farming communities and very interested in achieving large sales of their pesticides. The strong influence of pesticides vendors and quick results obtained in the short term after pesticides applications were presumably encouraging farmers to rely more on pesticides use than

on other pest control methods. This high dependence on pesticides by vegetable and flower growing farmers were also indicated that they were not aware of other pest management strategies that were effective, inexpensive and yet friendly to the environment.

The Tobit regression pointed out that there were four components which influence on the harmful effects of pesticides awareness index of the farmers. The component (1) includes wealth related factors and extension contacts such as farm income, family income, total land and extension visit. The people with high income can have facilities like TV, radio and newspapers and they have much more exposure to information. They can spend more money and time than the poor farmers to visit urban area where they meet many people in the market and share the news and experience. Moreover they can spend money for their children's education. Some farmers having sons or daughters who graduated from high schools or universities can be thought very differently from others ordinary farmers as they can learn or used to hear the up-to-date information and news. Nowadays, due to demand of the information age, people need to have the communicating facilities. For example, news or ordinary on agriculture and environmental affairs are being broadcasted through TV channels. So if the farmers have high income, they can probably improve the awareness level.

Information accessibility plays a vital role in expressing the AI levels of farmers. They can gain up-to-date information and news through diversity of media. Myanmar has TV channels broadcast in free of charge and some of them use to broadcast the documentaries on agriculture. But most of them are not much concerned with harmful effects and sustainable agriculture. There should be a special channel for

the farmers for their knowledge and awareness. Another difficulty was the most of the villages in the study area had no electricity supply and only some villages have community own small scale hydro-generators.

However, one disadvantage in having TV access was the farmers can be easily convinced by agrochemical companies with various kinds of attractions that can force the farmers to use their chemicals. Advertisement is a very effective way in motivating the farmers to use chemicals. Less and safe use of pesticides and upgrade the development of organic farming activities should be practices to the vegetable and flower growers. The extension service in Myanmar is just mainly focus on the rice cultivation and most of the rice farmers have extension contacts rather than those from the vegetables and flowers cultivation.

The component (2) community support significantly correlated with AI of the farmers at 0.05 level. This means that when the farmers have training experience for safe use of pesticides, they have high awareness on harmful effects of pesticides. The higher the numbers of times for training, the more the farmers have high awareness on harmful effects of pesticides. Also they can have more information about pesticides and they can be managed well in using pesticides.

This study found that training and provision of regular technical support through visits were extremely important to tackle risks of poisoning. However, the farmers aware that changes in practices and behaviors which have been used for many years and that cannot be accomplished overnight. Training should be encouraged as part of a major monitoring system, with all its multidisciplinary components in place to regular adequate use.

Nowadays extension service of Myanmar Agriculture Service (MAS) is in a very weak situation and becomes ineffective. There are insufficient extension agents per area and the lack of budgets for extension education processes. Moreover trainings for adult learning and extension education have not been conducted for a number of years in the study area. But some old farmers who have exposure to extension agents from MAS and those who had attended the short course on EM trainings (effective microorganisms) were found to be quite aware.

The component (4) commercialization including sharing information about pesticides and production of crops was significantly correlated at 0.05 level with AI. This means sharing about the good and weak points in using pesticides for crop protection between growers or technicians is very important. So if there is more sharing about pesticides, the farmers will have more awareness on harmful effects of pesticides. Production of crops including commercial and semi-commercial farmers had not different awareness on harmful effects of using pesticides.

The component (5) education is strongly significant with AI at 0.01 level of significant. That means education is very important in awareness of the farmers. The higher the education, the farmers they have more awareness on harmful effects of pesticides.

Knowing about the IPM program was very low number (22 per cent of the respondents) in the study area. Nevertheless, experience in various researches suggests that IPM practices can significantly reduce pesticide use without reducing yields. For example, Yudelman *et al.* (1998) described that CARE international helped maize farmers in Nicaragua to reduce pesticide by 70 per cent in a single year without changing yields.



Therefore, a combination of pesticide regulatory policies, programs to raise farmers' awareness on the harmful effects of pesticides, and a commitment to promote IPM practices by the government as well as NGOs may safeguard poor farmers in their pursuit of increased agricultural production and resulting increase in income and standard of living.

Growers in main surplus-producing areas need to follow GAP. By doing this, growers' supplies should not exceed maximum residue limits of pesticide. In addition extension workers should advise growers regarding chemical contamination of fresh produce. GAP extension education program needs to be carried out by extension workers and plant protection staff. With regard to pesticide spraying, the following key points are important to aware among growers which are,

- to observe the economic threshold level,
- to avoid frequent pesticide application
- to follow recommended rate
- to abstain from using banned pesticides
- to be aware of incorrect mixing of pesticides

Unless strengthening and promoting of harmful effects of pesticides in present, Myanmar may not be able to achieve sustainability and food security. Land and water resources must be preserved without being further polluted. Biological diversity must be conserved before it is too late. Information gathered in this study will be valuable in alarming the awareness of the farmers on harmful effects of pesticides and the hazardous to human and environment could be alleviated.

It was found that the level of education of most of the farmers was low; consequently, the base of learning or interest in surroundings was low. Hence, farmers

lacked the development of thinking and decision. Most farmers learnt the use of chemicals from advertisements given by chemical sales agents visiting the village during the planting season. The advertisements always emphasized on the chemical efficiency, not disadvantages of overdoing the amount of chemicals. In addition, regarding handling chemicals and chemical containers that would not give bad impact to the society and the environment if farmers lacked careful consideration before buying any chemicals because they clung to advertisements which led to wrong thinking and morale principle concerning the use of chemicals.

Although, at present, toxic residue in vegetables sold in the city's big market are tested, there is not such test in other local markets where vegetables are directly bought from the planting farms. Therefore, local consumers faced some risks of residue in vegetables. Additionally, some farmers ignored the useful insects helping in blending pollen and balancing the ecological system. These farmers' sprayed chemicals and destroying empty chemical containers were so close to farmers but they have never known that bad impacts that might harm them in the long run because they thought that these matters were so far and they did not realize correct ways of handling those matters.

Therefore, farmers shall have the behavior towards the safe use of pesticides when they have awareness on harmful effects of pesticides. To have the awareness, farmers must have correct knowledge and understanding about the use of chemicals. They must know the use chemicals in wrong ways can affect the society and how much uses will cause the bad impact to themselves and society. Pursuant to the study on factors affecting the awareness of using pesticides, it was found that education was important, this took effect to use of chemicals. Thus, in the researcher's



views, means to make farmers have knowledge, understanding, and awareness on harmful effects caused by the use of pesticides were to advise and give farmers the knowledge about the correct and safe use of chemicals. That will help the farmers to have actual knowledge and understanding about the danger of using pesticides, especially the effect of chemicals to themselves, society, and environment in the long term. Therefore, related officials and agencies should carry out surveys in relation to the use of chemicals by establishing the familiarity and informality with farmers in order to approach and learn existing problems caused by the use of chemicals. Thus the farmers will have more awareness of harmful effects caused by using pesticides and also their mind will be open and change their attitude to understand and cooperate with officials to solve problems together.