Pattern of Participation in Reducing the Pesticide at Amphawa Samut Songkram Province

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Abstract

This research paper was to examine the local farmers’ participation in managing the chemical contamination reduction from pesticide use and pest control in fruit farming. The population of this research was 46 fruit farming households of Suan Laung Sub-district, Amphawa District, Samut Songkram Province. These households were reported to be pesticide users. Questionnaire and focus group methods were utilized for collecting the data. The findings unveiled a significant level of involvement in the management of chemical contamination reduction from pesticide use and pest control. Fruitful suggestions elicited from the key informants in the focus group method were also made.

1. Introduction

Sciences and technological development has advanced, accelerating a massive degree of industrialization. Environmental problems have risen as a result of generation of disposal waste to sources of water as well as spread of factory smoke causing air pollution, and toxic contamination, which harm human health and quality of living. Amphawa District of Samut Songkram Province in Thailand is famous for the floating market and old community that won the 2008 UNESCO Asia-Pacific Heritage Awards for Culture Heritage Conservation. The destination also

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is an important source of fruit farming that mainly produce quality crops of lichee, pomelo and coconut. During the past few years, organic farming has been promoted among local people who do fruit farming. However in some areas, uses of pesticides has still been practiced where pesticide contamination cannot be well managed and can be toxic to humans through daily consumption. In case of reducing pesticide contamination in the area, the participatory model for local farmers has been believed to be a systematic approach to the management of chemical contaminants and agricultural pest control.

2. People Participation

People participation is a process under the responsibility of administrative authority in awakening people interest, drawing in their engagement, empowering and mobilizing their initiative, which ultimately contributes to a wide range of opportunities for different groups of people (Techarin, 1984). People participation holds that interests of mutual subject matters of development can be driven to achieve established goals and policy under the involvement of membership. Community participation process was modeled with the provision of the following participatory steps:

- identification of community problems and causes, and community needs and requirements
- discussion of alternative solutions and initiatives for the community
- formulation of community problem-solving policies and strategies, projects and activities responsive to community requirements
- local involvement in the decision-making process for maximizing the use of scarce resources
- local involvement in community administration and management, and effective community development
- encouragement among local people to invest locally by putting money into community businesses in accordance with their capability
- local participation in carrying out community projects and activities by plans with a common will of achieving community goals
- local participation in monitoring, controlling and evaluating of community projects and activities, as well as in following up the community projects that have previously been done.

The term community participation was defined as a process in which people in a community have the rights and are empowered to act in response to their community concerns; here in. they are empowered to identify problems and investigate causes of problems, and to take part in every step of community problem solving. Development project initiatives must originate from local people’s ideas and consensus, rather than merely from the outsiders (Rapee, 1994). A study elsewhere defined people participation that people and groups of people in rural communities have a common agreement and collective responsibilities in conducing socially beneficiary activities aiming to make positive changes to the society they live in and to achieve desired goals (Girdwichai, 2006).

The main principle of people participation for development holds that people get involved throughout the process from a start to an end; for instance, problem identification, decision making during planning preparation, gathering of local resources and innovations for project implementation, management and evaluation, including receiving benefits derived from implemented projects. Given this, it could be inferred that projects initiated in a community should be in compliance with community folkway and culture.

Furthermore, the heart of participation places upon communal wills and approval of actions of individuals, groups or society towards any situations that can affect their daily lives, those of which lead to expression of consent and decision making to using their collective power of actions to make changes within their objectives (Jeamponk, 2010). The process promote to local people the sense of self-learning and a perception of self-competency, analytical thinking and the sense of accountability in order to manage their living status and to elevate their necessary and sufficient economic and social conditions on the basis of existing scarce resources (Kritphisit, 1995).

Based on the review of literature on the definitions of community participation, it could be concluded that community participation could be referred to as an involvement of individuals or groups of people in a community in different steps of carrying out community projects and activities from discussion, planning preparation and decision making, including agreeing to receive and appreciate virtues, taking responsibility for results and willingness for any adjustment they may face from the project implementation process.
3. Participation Process

There are many theories of community participation process. Cohen and Uphoff (Cohen and Norman, 1985) defined the community participation process as the process with the four main principles: decision making, implementation, benefits and evaluation. The decision making process covers 3 steps including initial start of decision making, making a decision and applying the decision with implementation. The implementation process encompasses participation in resource supports, administration and cooperation for assistances. The benefits process deals with tangible, social and individual benefits. The last process refers to the evaluation. This theory concurred with the explanation of World Health Organization and the United Nations Children’s Fund. The people participation process and participation guidelines cover the four main steps (WHO/UNICEF, 1978).

- planning process, where people are empowered to analyze problems, prioritize, set goals, design uses of resources and evaluation methods, and make a decision on their own
- implementation process where people participate in operations and administration of resources, and have responsibility for budget allocation and financial control
- utilization process in which people should have a competency in mobilizing activities to reach their greatest benefits
- destining benefits in which people must receive benefits on the equality basis.

Based on the literature review, the community participation process could be encapsulated as the process where people in community are involved in planning, implementing, utilizing and receiving benefits.

4. Methodology

The objective of this research involved an examination of local farmers’ participation in managing the chemical contamination reduction from pesticide use and pest control in fruit farming. The previous community survey reported that 46 fruit farming households in Suan Luang Sub-district, Amphawa District, Samut Songkram Province were still used pesticides (Choo-In, 2008). Thus, the population of this research was these 46 fruit farming households. A questionnaire was employed for collecting the data. The questionnaire reliability and content validity test was conducted prior to data collecting, which reported standard reliability and validity. A focus group was also utilized in order to elicit more in-depth data from the selected group of informants to supplement the findings.

5. Findings

5.1 Demographic Findings

The findings unveiled that the number of male and female respondents shared a similar percentage, in which female respondents counted a higher percentage of 56.5. This majority was between 61-70 years old, in which an average age was 62.87 years old. Most respondent or 78.3 percent gained basic education, primary school level; followed by 10.9 percent gaining the upper secondary school level. Most of the respondents or 54.3 percent who represented their households were the family leader; whereas, 37.0 percent and 8.7 percent were family members and other persons living in the same dwelling, respectively. Each household reported a household mainly between 1-5 members or 78.3 percent, in which the average number of members was 4.28. Whereas on average the respondents had dwelled in Suan Luang Sub-district for 60.63 years, the average years of running the fruit farming household was 36.91. In regards to the respondents’ participation in the fruit farming household activities, it was found that the majority of them or 73.9 percent shared regular participation, followed by occasional participation with 26.1 percent.
5.2 Farmers’ Behavior of Pesticide Use and Pest Control in Fruit Farming

The findings of an investigation of the respondents’ behaviour of pesticide use in their fruit farming could be summarized into 3 parts: the behavior before pesticide use, the behaviour during pesticide use, and the behavior after pesticide use. Regarding the respondents’ behavior before using pesticide, Table 1 displayed the top 10 most frequently practiced conducts. Table 2 illustrated the respondents’ behaviour during use of pesticides, where the top 9 most frequently practiced conducts were reported. In Table 3, the top 8 most frequently practiced conducts after the pesticide use were presented.

The findings reported that an average mean score of the respondents’ behavior of pesticide use in before, during and after- use was 4.52, implying a very high ranking in the criteria. A consideration of each item presented the behavior during the pesticide use with the highest mean score of 4.59, followed by the behavior before and after the pesticide use, with 4.52 and 4.46 respectively.

5.3 Farmers’ Participation in Managing the Chemical Contamination Reduction from Pesticide Use and Pest Control in Fruit Farming

The examination of the respondents’ participation in managing the chemical contamination reduction from pesticide use in their fruit farming produced considerable findings where their involvement could be summarized into 5 stages: problem identification, planning, implementation of activities, benefit assessment, and monitoring and evaluation.

Table 1. The Top Ten Most Frequently Practiced Conducts Before Use of Pesticides.

| No. | Conducts |
|-----|----------|
| 1.  | You store pesticides in a locked cabinet away from children, pets and sources of food and water. |
| 2.  | You remove children, other persons not involved and pets before applying the pesticides. |
| 3.  | You use spreader or sticker for mixing pesticide concentrates and wear protective clothing such as gloves when loading and pouring pesticides. |
| 4.  | You wear chemical resistant clothing such as gloves, long- sleeves shirts and long pants when mixing the pesticide concentrates. |
| 5.  | You check whether pesticide equipment, such as a sprayers are in the appropriate condition before use. |
| 6.  | You avoid pesticide spillover when mixing pesticide concentrates, and in case of pesticide spills, you immediately and thoroughly wash your skin with soap and water. |
| 7.  | You apply labeling in case of transferring pesticides into another pesticide container or new container, and make sure the containers have no leaks. |
| 8.  | You never eat, drink, or smoke when mixing the pesticide concentrates. |
| 9.  | You always read the label carefully before applying the pesticides about the appropriate amount and proportion of pesticides. |
| 10. | You mix the pesticides in correct proportions labeled on the product container. |

In regards to the stage of problem identification, it was found that 5 actions as follows reflected the highest level of involvement: identifying impacts of chemical contamination in the community from pesticide use and pest control, identifying causes of the impacts, examining the present condition of the problems, investigating the community fruit farmers’ behaviour of pesticide use and pest control, and learning about the community fruit farmers’ living conditions.
Table 2. The Top Nine Most Frequently Practiced Conducts During Use of Pesticides.

| No. | Conducts |
|-----|----------|
| 1.  | You never spray the pesticides in strong windy conditions or just before and immediately after rains, and never spray against the wind direction. |
| 2.  | In case you or your family members are affected from pesticide poisoning, you immediately go for medical help at a medical center such as a hospital. |
| 3.  | Before applying the pesticide, you make sure there are no other people present, and ask them to be away from the area to be treated. |
| 4.  | In case a pesticide spray nozzle is not working, or cannot disperse pesticide liquid into a spray, you never use your mouth to siphon liquid materials or to blow out a clogged spray nozzle. |
| 5.  | You wear chemical resistant clothing such as gloves, long-sleeves shirts and long pants when spraying the pesticides. |
| 6.  | You never use spray equipment that have leaks when spraying the pesticides in the treated area. |
| 7.  | You wear a proper respirator mask or spray mask when spraying the pesticides. |
| 8.  | You never spray against the wind direction. |
| 9.  | You never eat, drink, or smoke when spraying the pesticides. |

Table 3. The Top Eight Most Frequently Practiced Conducts After Use of Pesticides

| No. | Conducts |
|-----|----------|
| 1.  | You always wash the spray equipment after use; make sure that the pesticide rinsates and rinse water from this operation is not discharged into river, and never clean the equipment in river. |
| 2.  | After the last pesticide application, you always follow the instruction labeled on pesticide product container of the required time between the application and the harvest of the treated crops. |
| 3.  | If a pesticide gets on the skin, you rinse as quickly as and as long as possible. |
| 4.  | You are always away from the pesticide treated areas to avoid chemical inhalation exposure. |
| 5.  | You collect pesticide clothing separately from other items of family laundry and launder separately from other clothing. |
| 6.  | You take a shower immediately after applying the pesticides. |
| 7.  | You wash pesticide application equipment separately from other equipment. |
| 8.  | You always bury or burn emptied pesticide containers. |

During the planning stage for the management of chemical contamination reduction from pesticide use and pest control, the findings revealed the top 4 actions of involvement which were as follows: discussing and contributing opinions to the community problems in regards to the pesticide use impacts, establishing monitoring and evaluation directions for the pesticide contamination management, considering necessary equipment used in the pesticide contamination management, and establishing directions for pesticide use management.

The implementation of activities carried out for chemical contamination reduction management encompassed 7 actions of the fruit farmers’ involvement: agreeing to integrate and organic farming, following laws and regulations of pesticide contamination reduction management, joining in publicizing activities and public campaigns to encourage people in community to reduce and stop using pesticides, learning and transferring local knowledge and wisdoms in producing natural or non-toxic pest control substances, supplying necessary equipment used in the pesticide contamination management, coordinating with municipal authority and requesting the support of government and the private sector in carrying out pesticide contamination management, and supplying labor and financial support as necessary to pesticide contamination management.

The respondents’ collaboration in the stage of benefit assessment during the management of chemical contamination reduction from pesticide use included 4 actions: applying the knowledge gained from participating in the pesticide chemical contamination management activities to the respondents’ own fruit farming, passing on the knowledge gained from participating in pesticide chemical contamination management activities to the public, receiving quality and toxic-free crops and earning more income, and reducing production costs due to using locally-produced, natural or non-toxic pest control substances.

The monitoring and evaluation stage revealed that the respondents were mostly involved in the following 4 actions: monitoring to ensure correct and transparent operation of the municipal authority office, evaluating after solutions were applied, brainstorming further alternative management methods for reducing the pesticide contamination in the community, and following up the operation of the municipal authority office in regards to the
management of chemical contamination from pesticide use and pest control.

From the abovementioned findings, it could be concluded that on an average, the respondents’ participation in the management of chemical contamination reduction from pesticide use and pest control was 4.47, implying very high ranking in that criteria. A consideration of each item presented the benefit assessment stage with the highest mean score, 4.61, followed by the implementation of activities, and problem identification stage, with 4.53 and 4.36, respectively. In conclusion, it could be inferred the findings that the fruit farmers of Suan Luang Sub-district, Amphawa District, Samut Songkram Province had a very high level of participation in all 5 stages of chemical contamination reduction management from pesticide use and pest control.

6. Discussion

The findings of this research reported a significant level of participation of the fruit farmers in Suan Luang Sub-district, Amphawa District, Samut Songkram Province in contributing to most of the stages in managing chemical contamination reduction from pesticide use and pest control in fruit farming. This was reflected in the fact that the local fruit farmers had been highly aware of environmental and health hazards resulting from contamination caused by pesticide and chemical pest controls. The fruit farmers’ participation had increased to a greater degree in all participatory stages when they had greater understanding of the community’s strong policy and campaigns of organic farming. A positive result from this participatory implementation could be evident in more efforts of the local farmers put to their household fruit farming activities concerning chemical contamination reduction from pesticide use and pest control in place. The community publicity of this concern had been effectively done to ensure that all households received the messages and participated in the activities; whereas, the municipal authority office gave good support to mobilize the community’s activities.

The focus group conducted with local farmers, agricultural academics and local experts contributed to some degree of success in implementing the management of chemical contamination reduction from pesticide use and pest control in fruit farming. These were displayed in Table 4.

Table 4. Directions for a Success of Implementing the Management of Chemical Contamination Reduction from Pesticide Use and Pest Control in Fruit Farming

| No. | Directions |
|-----|------------|
| 1.  | Establishing local leading team by assembling various local fruits farmers with an appropriate number of team members in order to cooperate effectively. |
| 2.  | Learning existing conditions of pesticide use and pest control practiced in different areas, both national and local level. |
| 3.  | Cooperating in publicizing knowledge and updates of management of pesticide use reduction and pest management by using various media and channels appropriate to different groups of farmers. |
| 4.  | Cooperating in planning for the management of chemical contamination reduction from pesticide use and pest control in local fruit farming. The implementation should encourage local participation in all 5 stages: problem identification, planning, implementation of activities, benefit assessment, and monitoring and evaluation. |

**Conditions for Success**

| 4.1 Meeting local farmers |
| 4.2 Working with local farmers |
| 4.3 Starting from what local farmers know/ have |
| 4.4 Allowing local farmers to learn from doing |
| 4.5 Encouraging local farmers to participate throughout the process |
| 4.6 Calling for local farmers’ participation in planning process, and linking the plans with their experiences |
| 4.7 Allowing local farmers to learn and practice in familiar environment |
| 4.8 Giving compliment to and acceptance of local farmers as experienced persons |
| 4.9 Pointing out benefits to be gained from project participation |
| 4.10 Listening and accepting each other |
| 4.11 Paying impressive attention and sincerity to others |
| 4.12 Being aware of and understanding individual differences of local farmers and other working groups |
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