

Health Effect from Pesticides among Klong Jed Farmers in Bueng Cham O Sub-district, Nong Suea District, Pathum Thani Province

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Abstract

This research is a cross-sectional descriptive study to investigate excessive chemical use and its impact on the health of farmers in Khlong Klong area, totaling 12 villages in Bueng Cham O Sub-district, Nong Suea District, Pathum Thani. Most of the samples of the population studied were farmers or related to agriculture in the study area, a total of 344 people. Data were collected using a questionnaire and then analyzed using descriptive statistics such as percentage, mean, standard deviation, etc.

The study found that most of the samples were male accounting for 55.2%, with an average age of 54 years, with the youngest being 26 years old and the highest of 89 years old. They own both their own land and land leased from others for farming. Almost all of the samples used agricultural pesticides and 95.3 percent of the sample used pesticides for plants. For health problems, most of them had congenital diseases like blood pressure and other diseases, representing 42.1% and 23.4%, respectively. Other diseases mentioned including cancer, skin disease, heart disease, muscle, joints, etc. are consequences of the use of agrochemicals for eliminating pests for a long time and accumulated in the body although most of the sample accounted for 91.3 percent were never affected by the use of pesticides. And some farmers who had been affected by the use of pesticides accounted for 8.7 percent encountered acute toxicity from the use of pesticides. But most of them have only mild symptoms such as nausea, vomiting, headache, dizziness, burning eyes, etc.

However, officials and relevant agencies still have to organize activities to protect themselves from the use of pesticides and some groups of farmers still do not receive the correct knowledge to raise awareness, practice, self-prevention in the regular use of pesticides on a regular basis

Keywords: farmer, pesticide used, health effect

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Introduction

In this study, a total of 12 villages in Bueng Cham O Subdistrict, Nong Suea District, Pathum Thani Province were studied. The study area was Thung Rangsit which originally when approaching Rangsit was called "Thung Luang". The area was originally containing a high steep scrub forest with overgrown grasses. In the past, Thailand was an agricultural country. The majority of the population is engaged in agriculture and most of the country's income comes from farming for export. Because Thailand has land suitable for agriculture, where crops can be grown all year round, but farming causes pest problems causing damages to farmers. Throughout the past, there has been the application of protective agents and pesticides in Thailand especially in high-income plants. Today, the agricultural industry in Thailand has rapidly expanded economically, resulting in continuous commercial agriculture, and agricultural cultivation requires chemicals for high yield and to meet the needs of the market. According to information from the Bureau of Plant and Agricultural Materials Control, the Department of Agriculture, and the Ministry of Agriculture and Cooperatives, it indicates that Thailand has tended to import agrochemicals continuously since 2005, especially in 2010 with a total production and import of 79.96 million tons, divided into domestic production of 93% and 7% for the import. And the most imported substances are organophosphate substances (Organophosphate) followed by the carbonate group (Carbamate) and organochlorine group (Organochlorine), respectively (Bureau of Plant and Agricultural Materials Control, 2013, online; Bureau of Environmental Health, Department of Health, 2012). The above data indicate that the use of pesticides by Thai farmers is increasing in volume since farmers can easily access and purchase, resulting in the use of chemicals beyond the specified requirement ratio. As a result, the pests adapt to such chemicals and farmers need to invent and modify the pesticide formula themselves, resulting in the eradication of pests requires using chemicals increasingly amounts according to the study of DuangjaiWichai (2011) which can be seen from the statistics of the import of pesticides. However, the use of pesticides

may affect the health of farmers who use pesticides incorrectly and unsafely resulting in illness from the use of chemicals.

Objectives

To study the health impacts from the use of pesticides of farmers in Klong Jed area, Bueng Cham O Sub-district, Nong Suea district, Pathum Thani Province.

Scope of Study

This research examined the health effects of pesticide use among farmers by collecting data using a questionnaire, observation, and discussion in the area of Klong Jed containing 12 villages in Bueng Cham O Sub-district, Nong Suea District, Pathum Thani Province (See Fig. 1) Most of the sample group were people in the area who worked as farmers or having careers related to agriculture, such as contracting farmers, Contract spraying services, etc., because these people are more vulnerable to exposure to pesticides than other occupations.

Research Methodology

1. The design of this research was descriptive research with a cross-sectional study

2. Population and sample used in this study include 344 sugarcane farmers who literally live in Bueng Cham O Sub-district Nong Suea District Pathum Thani Province.

Inclusion criteria: Farmers who use pesticides in agriculture in Bueng Cham O, Nong Suea Sub-district, and who agree to participate in the research.

Exclusion criteria: Those who have been diagnosed by a physician for having intellectual disabilities such as hearing or unable to communicate with words such as deafness, mute or mental disabilities who cannot provide information to the data collector.

This research deployed a collection of questionnaires and interviewing samples in the area using the Convenience Sampling method which refers to a random sampling to mainly obtain the required number of samples. Any unit of population will be used for the study to provide information.

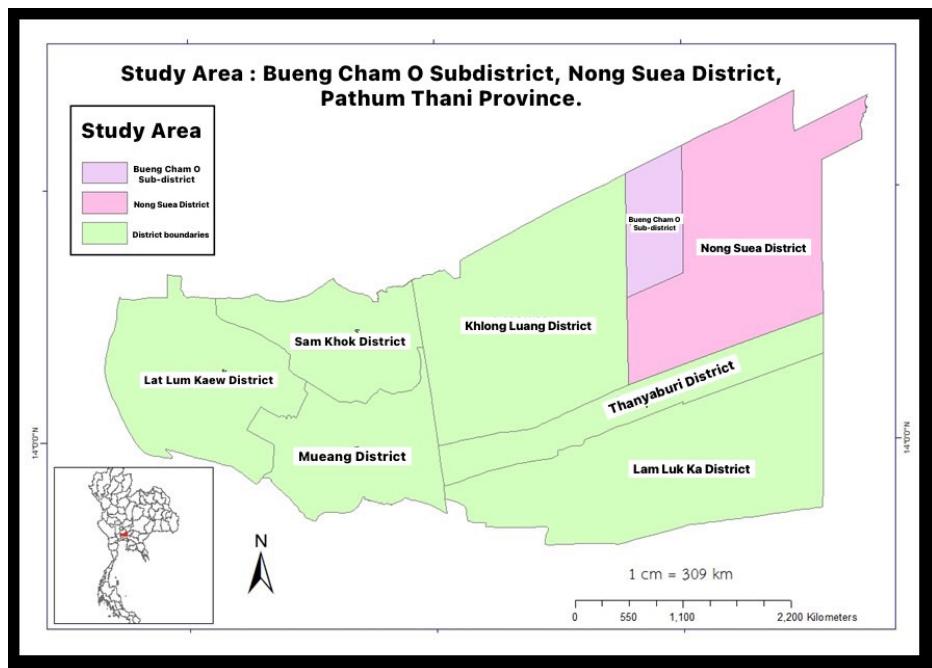


Figure 1: Boundary map of the study area, Bueng Cham O Subdistrict, Nong Sua District, Pathum Thani Province.

3. Sample Size Calculation

The formula for calculating the sample size in the survey was used to estimate the proportion of the population. If the exact number of the population is known, the questionnaire used is calculated to determine the sample size using Taro Yamane (Yamane, 1973) method with a confidence level of 95 percent using the Yamane formula to calculate the sample size. That is very important in research. Because if the required sample size is appropriate, the data obtained from the sample is sufficient, resulting in valuable and reliable research results. The sample size can be calculated from the following formula:

$$\text{Formula} \quad n = \frac{N}{1 + Ne^2}$$

where n is the number of samples.

N is the total population.

e is the sample error (tolerance equal to 0.05)

where $N = 2457$

$e = 0.05$

When substituting the values, the sample size will be as follows:

$$n = \frac{2457}{1 + 2457(0.05)^2}$$

$$n = 344$$

Substitute the values in the formula to get the sample size as follows: $n = 344$ cases

The result of the calculation is the sample size of 344 people, which is close to the number of the study population. In order to be able to collect data for greater credibility, data were collected according to the total population of 344 case.

4. Tools used in the research

The research deploys the interview form created by the study which covers the objectives and questions of this research based on literature reviews and related research according to the advice of the advisor and experts to use in collecting data this time. It consists of 4 parts as follows.

Part 1 : General information consists of gender, age, congenital disease

Part 2: Information on the use of pesticides including duties related to the use of pesticides, the purpose of using pesticides, chemicals used, sources of pesticides, reasons for choosing pesticides, and training on the use of pesticides.

Part 3: Behavior of using pesticides, including the amount of time spent with pesticide application daily, and reading of labels before using pesticides. How to mix pesticides. Equipment used for spraying in sugarcane fields. Wearing personal protective equipment

while spraying. The behavior of cleaning after pesticide spraying

Part 4: The health effects of the use of pesticides among farmers include immediate symptoms. and symptoms after the use of pesticides by farmers

Results and Discussion

From the results of the study, it was found that most of the areas were agricultural areas. Most of the samples were male, 55.2% (as shown in Table 1), with an average age of 54 years, aged 20-81 years and over. The most is of 41-50 years old and most of the sample population in the area is engaged in the agricultural sector accounting for 89.9 percent of the area (as shown in Table 1)

And most of the sample population in the area are engaged in the agricultural sector representing 89.9 percent of the area and 10.1 percent working in the

non-agricultural sector (as shown in Table 2). From the above data, it was found that almost all of the samples had used pesticides, accounting for 95.3 percent, and only 8.7 percent were affected by the use of pesticides. Use pesticides and most of them will get acute poisoning (Actue toxicity), which will have the following symptoms: headache, dizziness, burning skin, burning eyes, nausea and vomiting, etc. And by the sample group that has never been affected by the use of pesticides, representing 91.3 percent. The questionnaire showed that most of the samples had proper self-protection methods. And mix according to the ratio on the product label in mixing the chemicals. And protect yourself before spraying pesticides, for example, wearing coveralls, wearing gloves, wearing glasses and mixing according to the ratio on the product label when mixing chemicals and protect themselves before spraying pesticides (as shown in Table 3)

Table 1. Gender and Age classification of the sample

Variable	Number	Percentage
Gender (n=344)		
Male	190	55.2
Female	154	44.8
Age (n=344)		
Not over 20 years old	0	0
21-30 years old	10	2.9
31-40 years old	39	11.3
41-50 years old	100	29.1
51-60 years old	96	27.9
61-70 years old	70	20.3
71-80 years old	21	6.1
81 years old or older	8	2.4

Table 2 Occupation classification of the sample

Variable	Number	Percentage
Occupation (n=344)		
agriculture sector	309	89.9
outside agriculture	35	10.1

Table 3. Effects from the use of pesticides in agriculture

Variable	Number	Percentage
Chemical pesticides(n=344)		
Use chemical pesticides	309	95.3
Do not use chemical pesticides	35	4.7

Table 4. The number and percentage of the population of the Bueng Cham O sub-district sample group classified by the effects of the use of pesticides. and abnormal symptoms after the use of pesticides.

Variable	Number	Percentage
Effects of the use of chemical pesticides (n=344)		
Have been affected by the use of chemical pesticides	30	8.7
Never been affected by the use of chemical pesticides	314	91.3
An unusual symptom occurred after the use of pesticides.(more than 1 answer)		
dizziness/headache	25	83.3
Red/burning/itchy eyes	12	40
burning nose	7	23.3
Skin rash/blister	7	23.3
itchy skin/dry cracked skin	5	16.6
sweating/palpitations	3	10
have a burning pain	2	6.6
shortness of breath	1	3.3
shock/loss of consciousness	1	3.3

From a total of 344 samples living in Bueng Cham O Sub-district. Nong Suea District from asking farmers who use pesticides about the effects that they have received from the use of pesticides, it was found that farmers who use chemical pesticides and had been affected by the use of pesticides, there were only 30 people, representing 8.7 percent and 91.3% of the farmers in the area were asked about the health effects of pesticides and found that abnormal symptoms occurred after the use of pesticides. Knowing that the most common symptoms are Dizziness/headache 83.3% Redness/burning eyes/itchy eyes It was 40%. Nasal burning and skin rash/blister were 23.3%, skin/broken skin. accounted for 16.6 percent. Sweating/palpitations accounted for 10%, and burning pains accounted for 6.6%. The

least common was shortness of breath. and shock and unconsciousness accounted for 3.3% (see Table 4). Farmers' Self-Defense in Klong Jed Area, Bueng Cham O Subdistrict

Out of a total of 344 sampled populations, 309 farmers were employed by farmers who used pesticides. On self-defense while spraying pesticides from the behavior of wearing personal protective equipment while spraying pesticides, it was found that 88.3% of farmers in the area wore gloves, 58.9% wore eye masks, and 58.9% wore nose and mouth masks while 79.3 wore boots, 79.3 percent did not wear protective clothing especially for chemicals 89.6 percent (as shown in Table 5).

Table 5. Farmers self-defense from the use of pesticides In the Khlong Chet area, Bueng Cham O Subdistrict.

Variable	Number	Percentage
Wearing personal protective equipment while spraying pesticides (n=309)		
- Glove		
not used	36	11.7
use	273	88.3
- Eye protection mask or goggles		
not used	127	41.1
use	182	58.9
- Nose and mouth protection mask		
not used	64	20.7
use	245	79.3
- Boots		
not used	10	3.2
use	299	96.8
- Hazardous protective clothing specifically for use with chemicals		
not used	277	89.6
use	32	10.4

Conclusion

From the study of 12 population groups in Klong Chet area in Bueng Cham O Sub-district, Nong Suea District Pathum Thani Province, it can be summarized as follows: the sample population in the area Most of them do agriculture and use of pesticides as a result of wanting to get rid of the annoying insects and weeds. They also want to produce good quality produce and can be sold for a high price and to reduce the time of farming. But if farmers in the area use chemicals in large quantities, it will result in causing the contamination of the chemicals to remain in the soil, water sources, causing the environment to be affected for a long time. This is consistent with the results of the study by Suchitra Chukerd, Thiptiwa Sampanphan and Wichuda Ketmai (2012) found that the use of chemical fertilizers in farming causes the land to contain heavy metals such as lead, zinc and copper, which affect the health of farmers.

The information of sample population in the study area from a questionnaire about the use of pes-

ticides, in most cases, pesticides are used in agriculture. Most farmers do it themselves ranging from the process of choosing to buy pesticide products, mixing and spraying. Regarding farmers who have experienced acute toxicity from chemical pesticides (Acute toxicity), they encounter symptoms of dizziness, nausea, vomiting, burning eyes, burning skin, etc. Especially when using chemicals throughout the spraying, wrong combination of pesticides. This is in line with the study of Wittaya Tun-Aree and Samart Jaitia (2011). It was found that 78.6% of the samples mostly had problems with the musculoskeletal system, ligaments, bones, especially the sprayed samples, 63.8% of household members still have neurological problems, with those who have been exposed to chemicals for more than 20 years tend to have symptoms higher than other groups caused by the use of ineffective protective equipment. These pesticides will gradually accumulate in the body resulting in Thai farmers having congenital diseases later such as high blood pressure, heart disease, lung disease, skin disease, cancer, paralysis, etc.

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Suggestions

Educating how to use pesticides and self-protection and the health effects of using pesticides correctly during use have not made farmers understand deeply. Government agencies related to agriculture have to go to the area to educate farmers on the correct approach and method on the use of pesticides and the correct ratio of use. There must also be a way to protect yourself from spraying chemicals that take a long time. Including education about health problems when exposed to pesticides.

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