

## “Effect of Agrochemical use in vegetable production: A situational study in a village of Comilla district.”

### Abstract

The excessive use of chemical fertilizers and pesticides has been a threat to agricultural production, soil and health. The research work is conducted mainly to focus on the adverse impacts of pesticide use on human health and to describe the current status of pesticide use in Jaspur village of Comilla district. From 65 households data were collected from 40 households. Data was collected by using a direct interview method with a pretested questionnaire. The questionnaire includes both structured and non-structured questions. It has been observed that maximum 52.5% farmers said that they are affected through mouth and breathing, 22.5% farmers said they were affected through eye, skin, mouth and breathing, 5% through eye, skin and mouth and 5% through mouth. About 37.50% respondents waited one week to collect vegetables after pesticide use. 77.5% respondents did not get any training about pesticide use as a result they are highly dependent on dealers. Lack of awareness was a great problem in this village. So in order to increase awareness training is very much essential. It was a social research but scientific research is essential in this village.

**Key words:** Pesticide, Vegetable, Knowledge, Health problem.

### Background/Statement of the problem:

Bangladesh is situated in tropical and sub-tropical climates. This climate is suitable for growing a large number of vegetables (1). Vegetables are a group of important crops which provide nutrients that is vital for health and maintenance of our body(2). The present rate of vegetable consumption (126gm per day per capita) is low than the minimum daily requirement of 400gm per capita as recommended by FAO and WHO(1). Most of the vegetables that are grown in Bangladesh are attacked by various pests (2). In order to control vegetable pests, pesticides are applied to the environment (3). Pesticide was introduced in Bangladesh in 1957 as an agricultural input. Pesticides become very popular to the farmers for mainly two reasons; firstly quick and visible effect on pest and secondly, no cost involvement(10). In Bangladesh it has been found that yield of vegetable is much lower in non-treated plots compared to treated plots (4). But unfortunately this yield success is accompanied with various health problems. Applied pesticides spread in the environment affect the health of un-protected agricultural and industrial workers. There are three major routes of entry for pesticides include contamination of the skin, lungs and the gut. Various health problems such as memory loss, loss of coordination, reduced speed of response to stimuli are outcomes from pesticides. Others problem included asthma, allergies, cancer, hormone disruption, fetal development and reproduction problem (Gillbert, 2012). Though pesticides are very harmful for health, these pesticides are now being used indiscriminately by the farmers of Bangladesh (7). Mollah (2000) observed an increase in use of

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**Comment [H3]:** Out of 65 households data were collected from 45.

**Comment [H4]:** A direct interview method with a pretested questionnaire was used to collect the data.

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**Comment [H11]:** training farmers was essential

**Comment [H12]:** Although this was a social study but it was observed that scientific study was required in this village.

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pesticides by farmers in controlling pests throughout Bangladesh (8). Vegetables are sprayed heavily up to the time of harvest, and then sent directly to market with no waiting period; moreover, many are consumed whole. These create a potential for pesticide residues causing negative health effects on consumers (9). Dey et.al. (2013) found that excessive sweating; burning eyes and fatigue were reported by 26.3%, 24.4% and 18.8% of the farmers, respectively. The farmers of Bangladesh are not properly trained about pesticide use. By considering all these reasons the study mainly aims to explain the adverse impacts of excessive and contaminated pesticide use on human health in Jashpur village of Comilla district. Moreover, there are several numbers of specific objectives. These are:

1. To describe the current status of pesticide use in Jashpur village of Comilla district.
2. To identify the knowledge level of farmers about health hazard due to pesticide use.

### Methodology

The study was conducted in Jashpur village of Kalibazar union under Comilla district where most of the farmers grow vegetables. A preliminary field investigation was conducted. Then the major vegetables such as sweet gourd, tomato, potato, bean, brinjal were on the field. Jashpur village is a small village of sadar upazilla of Comilla district. Jashpur village has 65 households. From 65 households data was collected from 40 households. Data was collected from the male member of the household. Data was collected by using a direct interview method with a pretested questionnaire. After pretesting the questionnaire was modified by collecting background knowledge from the preliminary investigation. Then final questionnaire was prepared to collect information on pesticide use of vegetables. The questionnaire includes both structured and non-structured questions. The questionnaire includes questions like age, education, income, occupation, duration of involvement in agriculture, types of agricultural production etc. The data was collected by stratified random sampling. Most of the respondents from whom data was collected did not received any training. Their knowledge level was not also up to the mark about health problem and how to use pesticide properly.

**Fig. 1. Map showing study location in Comilla**



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**Comment [H21]:** present study

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**Comment [H31]:** Map only shows the Comilla district not the exact study location.

**Comment [H32]:** Figure legend should be at the bottom of the figure

### 3. Results and discussions

#### 3.1. General Characteristics of Respondents

Maximum 45% and 32.5% respondents were middle and old aged. Majority 75% respondents had education up to class five only 12.5% had education level above ten. Maximum 90% of the farmers were involved in agriculture (vegetable), 3% of the farmers were involved in business 7% farmers were involved in service. So most of the farmers were involved in agricultural activities. Most of the respondents that is 43% had monthly income less than 10000 and only 3% respondents had monthly income above 40000%. Maximum 50% respondents had involvement in agriculture above 20 years. So farmer's activity in agricultural sector is high. 32.5% respondents produce winter vegetables, 12.5% respondents produce both winter and summer vegetables and only 5.5% farmers produce year round vegetables. So farmer's winter season vegetable production is high. Respondents produced vegetables both for household consumption and commercial purpose. Maximum number of respondents 47.5% respondents used local seed, 37.5% farmers use both local and hi yielding seed and 15% farmers use only Hi-yielding seed. It is noticed that 80% farmers sell vegetable in local market and 20% farmers sell vegetable in both local market and traders. Majority 80% respondents sold vegetables in local market and 20% respondents sold vegetables both in local markets and traders. All of the vegetable farmers consumed vegetables that they produce.

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#### 3.2. Cultivated vegetables by the respondents

Data contained in Table 1. indicates that farmers produce almost all types of winter vegetables. Besides these vegetables they also cultivate cabbage, taro, amaranthus etc.

#### 3.3. Whether or not respondent gets training:

Respondents were asked whether or not they received any training. 77.5% respondents said that they did not get any training. Only 22.5% vegetable farmers get training. From 22.5% farmers 2.5% gets training about production technology, 2.5% appropriate pesticide uses, 5% IPM and production technology, 2.5% IPM and appropriate pesticide uses and 10% gets training on production technology and appropriate pesticide uses.

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#### 3.4. Types of medicine used in vegetables:

Figure 2 shows that maximum numbers of respondents 95% use pesticide for vegetable cultivation, only 2.5% use organic measure and 2.5% use both organic and pesticide. So farmers mainly use pesticide in vegetables.

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#### 3.5. Name of pesticide used in vegetables:

From the Figure 3 it can be told that maximum vegetable farmers did not know about name of pesticide. They told that they collect pesticide from dealers and they use pesticide as told by the dealers. So maximum farmers had no proper knowledge about proper pesticide use.

**Comment [H49]:** observed

**3.6: Type of pesticide used in vegetables:**

**Comment [H50]:** Form

Figure 4 shows that 55% farmers use powder type pesticides and 45% farmers use powder and liquid type pesticides.

**Comment [H51]:** Form of

**3.7: Form of pesticide use**

**Comment [H52]:** Method of pesticide used in fields

Figure 5 shows that 95% farmers use pesticide in vegetables by spraying, 2.5% farmers use pesticide directly, 2.5% use pesticide both by mixing with water and powder type also.

**Table1 : Types of vegetable cultivation:**

Cultivated vegetables by the respondents	No of respondents	% of the respondents
Potato	1	2.50%
Tomato and Brinjal	1	2.50%
Tomato,Brinjal,Potato and bean	5	12.50%
Tomato,brinjal,potato,bean and sweetgourd	8	20%
Tomato,Brinjal,potato,bean,sweetgourd,other	4	10%
Tomato,brinjal,potato,bean and others	3	7.50%
Tomato,Brinjal,Potato and sweetgourd	1	2.50%
Tomato,Brinjal,bean	1	2.50%
Tomato,brinjal,bean and sweetgourd	2	5%
Tomato,brinjal and others	1	2.50%
Tomato and potato	2	5%
Tomato,potato and bean	2	5%
Tomato,potato,bean and sweetgourd	1	2.50%
Tomato,potato,bean and others	1	2.50%
Tomato,potato and sweetgourd	1	2.50%
Tomato,potato and others	1	2.50%
Tomato and others	1	2.50%
Potato,bean and others	1	2.50%
potato and sweetgourd	1	2.50%
potato,others	1	2.50%
Bean and sweetgourd	1	2.50%

**Fig 2:Types of medicine used in vegetables**

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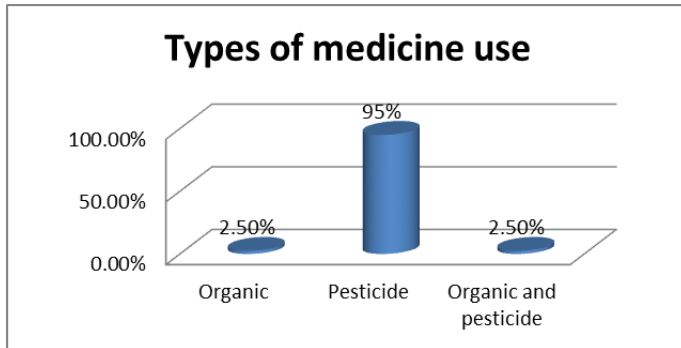


Fig 3: Name of pesticide used in vegetables

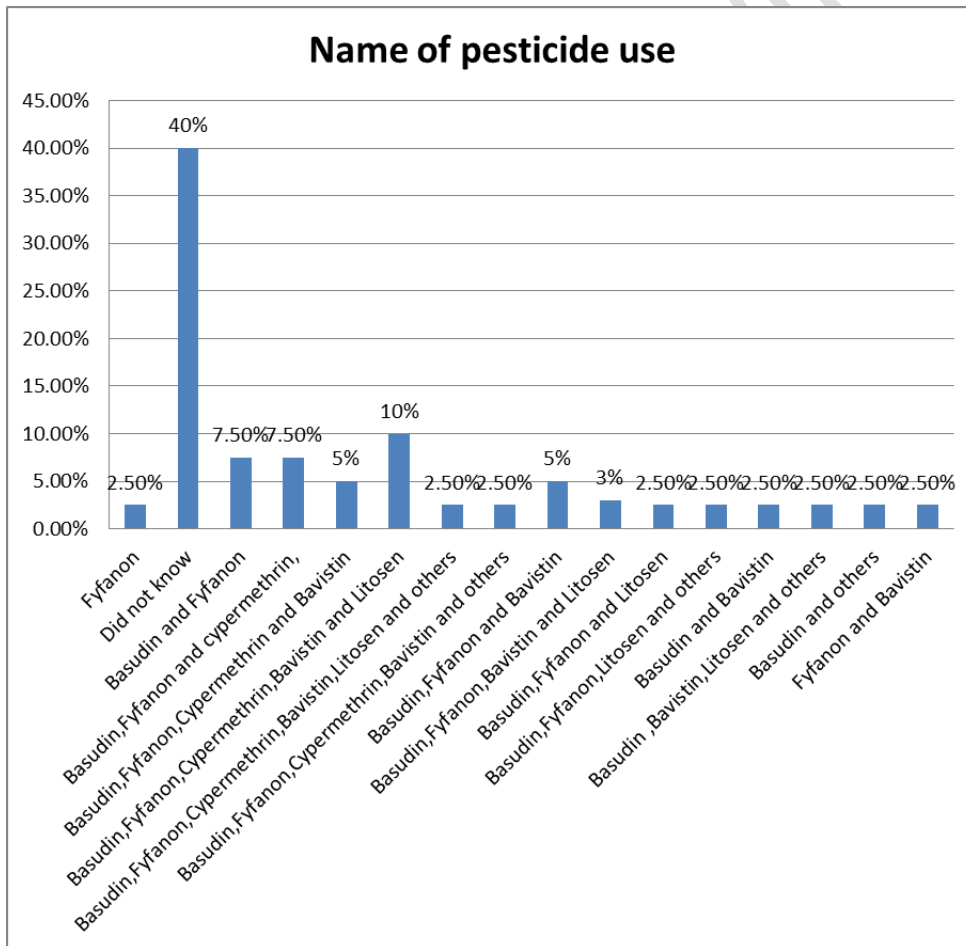


Fig 4: Type of pesticide used in vegetables:

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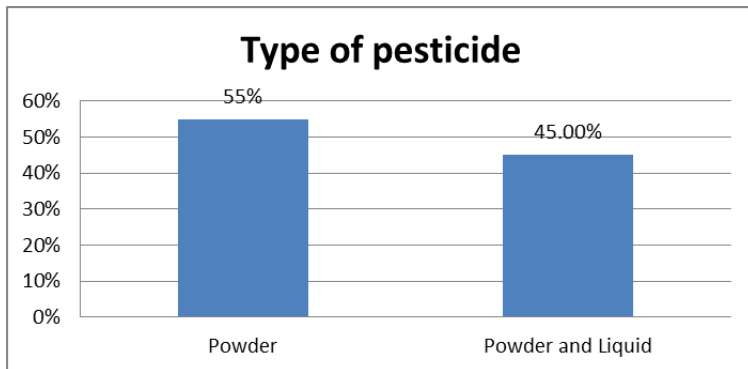
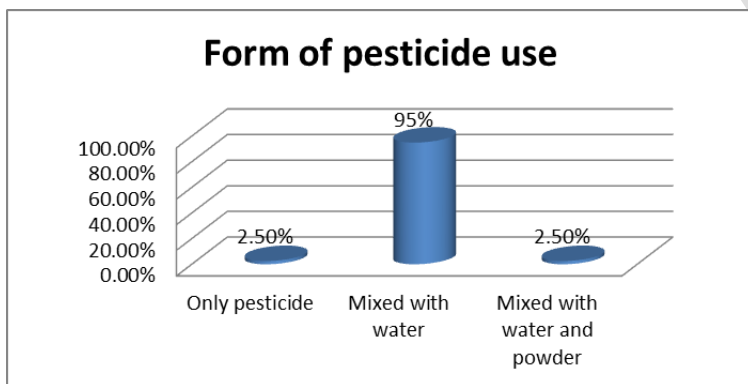


Fig 5: Form of pesticide use

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### 3.8. Maintenance of pesticide used instruction

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Fig 6 shows that 60% farmers had medium maintenance level of pesticide use instruction. 20% had high maintenance and 2.5% had both high and medium level maintenance.

### 3.9. Time of Pesticide use

From Fig 7 it can be shown that 60% farmers use pesticide weekly, 27.5% farmers use pesticide weekly 2/3 times, 2.5% daily, 2.5% both weekly and weekly 2/3 times and 7.5% farmers use pesticide by other means.

Comment [H57]: Can be observed or you can say the fig 7 explains the number of time the farmers used pesticide in the fields.

### 3.10. Whether or not they knew about the effect of pesticide:

Vegetables farmers were asked whether or not they knew that pesticide is harmful for health. 80% vegetable farmers said they knew about health problem. 20% said they did not know that pesticide is harmful for health.

### 3.11: Farmers experience about pesticide affection

52.5% farmers said that they are affected through mouth and breathing, 22.5% farmers said they were affected through eye, skin, mouth and breathing, 5% through eye, skin and mouth and 5% through mouth.

**Comment [H58]:** Do they mean that the respiratory tract is affected?

**3.12. Time of days waited by the farmers to collect vegetables after pesticide use:**

37.5% vegetable farmers said that they wait one week after pesticide application, 27.5% farmers said they wait two week after pesticide application, 22.5% said they wait 2/3 day after pesticide application, 10% said that they wait one day after pesticide application and 2.5% farmers give pesticide within 1-3 days.

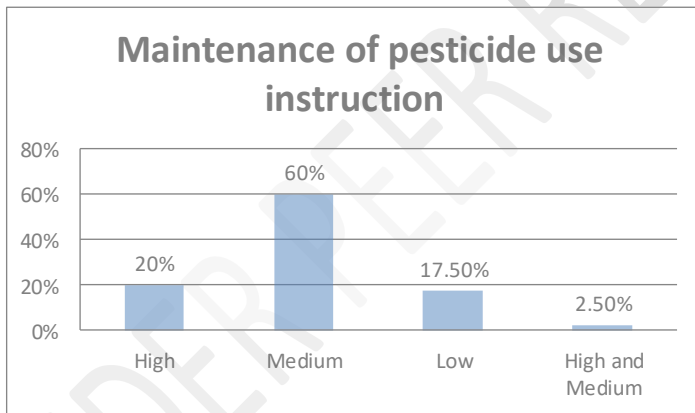
**3.13. The effect of pesticide on human health.**

52.5% said that they know about health of pesticide, 37.5% said that they partially knew about health problem, 10% said that they did not know about health problem.

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**Fig 6: Maintenance of pesticide used instruction**

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**Fig 7: Time of Pesticide use**

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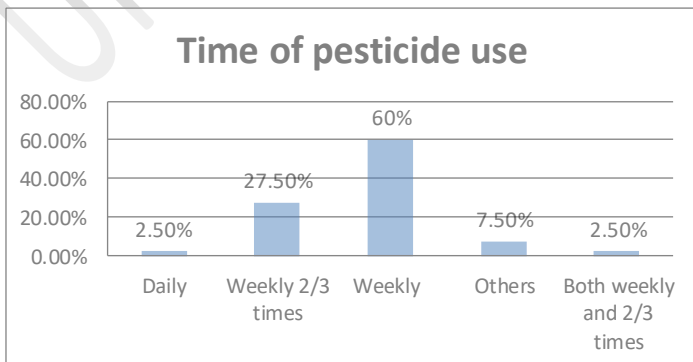


Fig 8: Farmers experience about pesticide affection

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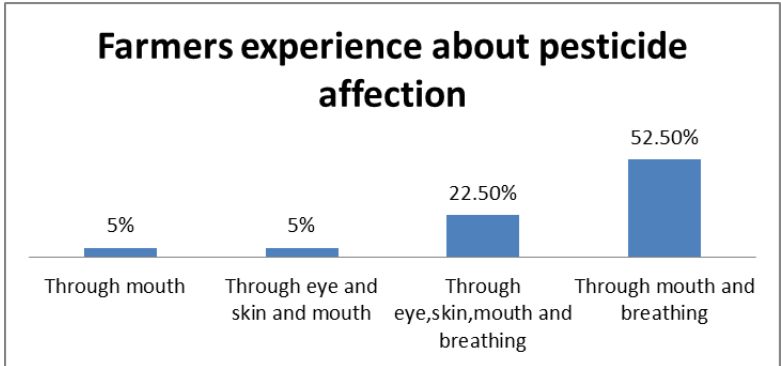


Fig 9: Time of days waited by the farmers to collect vegetables after pesticide use:

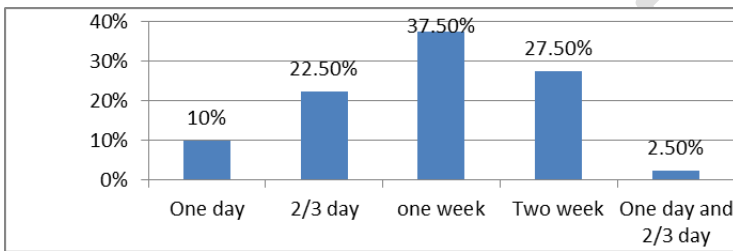
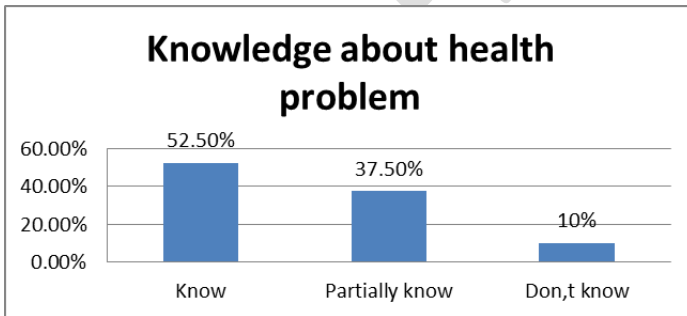


Fig 10. The effect of pesticide on human health.



### 3.13. Difficulties in vegetable cultivation:

Farmers were asked about their difficulties of vegetable cultivation. Their mentioned difficulties were capital, seed, harmfulness, rotting disease, lack of training, rainfall, low production of brinjal, collection of loan from dealers, if lands are landed then income becomes less, low production, and excess pesticide causes loss of flower.

Comment [H63]: Please rewrite the para



### 3.14. Suggestions of respondents:

Mask and appropriate clothing should use, it should be given before preparation of the land, and when seedlings are uprooted then spray should be given,when production is not good, by observing pest pesticide should be given,When seedlings are uprooted endofil should be given,pesticide should be sprayed very carefully, traditional system should be followed or pesticide should be given at least one time in a month,need more training, need organic benefit,Quality seed, pesticide for vegetable production, technology introduction,govt facility is essential, income depends on capital.Govt does not help in capital formation,some effective measurement should use.

**Comment [H64]:** Rewrite the paragraph

### **COMPETING INTERESTS DISCLAIMER:**

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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**Comment [H65]:** Not the way to write in reference

12. Pesticide use in Bangladesh tripled in 10 years retrived from  
<http://news.agropages.com/News/NewsDetail---3862.htm>(Sep. 22, 2010).

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