

Attitude and Awareness – A survey conducted at Kinakary, Kuttanad, India regarding the application of insecticides

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Abstract- A detailed survey was conducted at Kinakary Grama Panchayat covering various aspects of insecticide application, attitudes and awareness of people in the area. There were six hundred houses involved in agriculture and among them 306 families were cultivators and 295 families were agricultural labourers. A total of 200 people participated in the study in which 115 were males and 84 were females. Visited houses and collected details as per the requirements of the questionnaire. The information from the questionnaire was sorted scientifically and proper statistical tool. Higher doses of insecticide can cause more harm to environment and to the non-target organisms than expected and it is difficult to measure the impacts since there is no uniformity in the application doses even in a particular field. 88% people involved in the study tried to repair their instrument. Repairing a filled sprayer in the field increases the probabilities of field contamination and the chances of pesticide entry to the person doing the same. Use of protective clothing and equipment were totally neglected by 26.5% people participated in the present survey. Another 13% took it lightly and used partially. This shows that 39.5% people were unmindful of their own health issues. Among them 21% were not bothered even to change their dresses after spraying pesticides and enter other walks of life immediately.

Index Terms- Pesticides, Insecticides, Paddy fields, agriculture, non-target organisms

I. INTRODUCTION

Chemicals applied to the environment aiming at target organisms, very easily reach and affect non target organisms including humans (WHO, 2010). Insecticides applied in one region are likely to be transported over long distances by air circulation and through water. Hageman *et al.*, (2006) has reported the presence of current and historical insecticides or their breakdown products in surface water and biota in regions far from the source of their original application to the landscape. Insecticide applicators are primarily at risk since they directly come in contact of pesticides and absorb them through intact skin and clothing (Hazarika, 2011). Three million workers in the developing world experience serious poisoning from pesticides every year and about 18,000 die (Miller, 2004). This may be

even greater due to under reporting, lack of data and misdiagnosis (Wilson and Tisdell, 2000). Developing countries experience majority of pesticide poisoning and death, although these countries use only 25% of global pesticide production. Developing countries have a higher percentage of the population involved in agriculture, the safe health criteria can be insufficient or non-existent, they have poor insecticide handling practices, they commonly use insecure equipment, their knowledge of health menaces and safe use is limited and harmful pesticides are easily reachable to them.

Insecticide pollution of surface water can arise from localised (point) and diffuse (nonpoint) sources (Carter, 2000; Gerecke *et al.*, 2002). Point source of pollution are the result of handling procedures, such as spills during filling of the sprayers, cleaning and repairing of the equipment, employment of defective instruments and the management of spray wastes. Many workers have pointed out that the main risk of point source pollution is poor operator handling within the farmyard area where spraying equipment are filled (Kreguger, 1998; Fait *et al.*, 2007). Diffuse or nonpoint source of pollution is the movement of pesticides from the field they are applied to the surface water or ground water (Carter, 2000).

Kinakary is a village located about 15 km away from Alappuzha town. The Grama panchayat comprises of 9 wards with 5034 houses. Most of the people living in this region depend mainly on agriculture especially rice farming to make living. Vast stretches of paddy fields and the gorgeous sight of the Vembanad Lake catch the attention of anyone visiting the area. A preliminary investigation has proved a lack of sufficient awareness among the applicators regarding the protocols of insecticide application and handling of these chemicals. A detailed survey was conducted at Kinakary Grama Panchayat covering various aspects of insecticide application, attitudes and awareness of people in the area.

II. METHODOLOGY

The detailed census document of Kinakary Grama Panchayat was collected from the state census department and planned a survey procedure accordingly. There are 5032 houses in the panchayat according to the census document of the State. Ward 9 of the Kinakary Grama panchayat was selected for the study. The households were listed to find out the cultivators and the agricultural labourers of the ward. There were six hundred houses involved in agriculture and among them 306 families

were cultivators and 295 families were agricultural labourers. From this lot 200 houses were selected by random sampling. An awareness seminar was conducted for the students, teachers and farmers of the region regarding pesticide hazards and environment pollution. A questionnaire covering the possible issues regarding insecticide application, precautions, awareness and the attitude of people towards the use of insecticides was prepared in Malayalam. Visited houses and collected details as per the requirements of the questionnaire. Information was collected from the elders available during the visit. The information from the questionnaire were sorted scientifically and proper statistical tool (95% confidence interval) employed to analyse the results and arrived at conclusions.

III RESULTS

The preliminary details of the survey conducted were depicted in Tables 1. The percentage and 95% confidence interval with lower and upper limits were illustrated in the (Tables 2) [Fig 1] shows the graphical representation of the data received.

A total of 200 people participated in the study in which 115 were males and 84 were females (Table 1 and Fig 1). People were asked regarding the procedure they resort to at the onset of a pest attack. 85% resort to chemical methods for controlling harm full insects, only 3.5% tried organic options and 12.5% tried both organic and chemical methods. (Table 1 and Fig1). Only 56.5 % people strictly followed the procedure of application as instructed but 16.5% totally neglected all instructions of application and 27% partially obeyed (Table 2 and Fig 2). Regarding dress code 60.5% wore a protective dress while spraying poison, 26.5 neglected adopting any dress code and 13% paid a partial attention (Table 3 and Fig 3). A good majority changed their dress after the application (79%) of the insecticide but 21% ignored changing their dress (Table 4 and Fig 4). Repairing the sprayer while spraying was done by 88% (Table 7 and Fig 8). 51% practiced unhealthy habit like chewing, smoking or consumption of alcohol etc. of which smoking stood first (Table 8 and Fig 9 and 10). Majority of People (69%) had the opinion that the awareness campaigns against the indiscriminate use of insecticides in the paddy fields were insufficient (Table 10 and Fig13).

IV DISCUSSION

Collecting details directly from the people, involved and living in the actual environment is a valuable tool in identifying the real issues and finding out the depth of impacts of such issues relating to human life. Out of the 200 people interviewed 84% were resorting fully to the chemical methods of pest control. The 95% confidence interval showed a lower CI of 78.9 and an upper CI of 89.08. This reveals an unshakable dependence of people on chemical insecticides. Regardless of all awareness programs people were interested in chemical insecticides due to their immediate effect upon pest population. Introducing pesticides into the environment, ignoring all scientific instruction of application was practiced by 16.5% (lower CI

11.35 and upper CI 21.64) of people in the region and 27% (lower CI 20.84 and upper CI 33.15) partially follow the instructions of application of insecticides. Together they form 43.5%. This shows that nearly 50% of the people involved in the survey were using these chemical as if they saw fit. This is a matter which needs urgent attention since the introduction of insecticides beyond the recommended dose may surpass all means of degradation by nature and may enter different trophic levels. The dilution of an insecticide prior to its application is a very important procedure because its efficacy is very much related to the accuracy of the dose introduced. Moreover higher doses of insecticide can cause more harm to environment and to the non-target organisms than expected and it is difficult to measure the impacts since there is no uniformity in the application doses even in a particular field. The safety of the applicator is another immediate issue to be addressed because the applicator is one who is directly exposed and vulnerable to insecticides. Hence the use of safety clothing and equipment like coverall, water proof spray suits, gloves, boots, goggles and face shields, hats, aprons and respirators are inevitable for an applicator. But the use of protective clothing and equipment were totally neglected by 26.5% people participated in the present survey. Another 13% took it lightly and used partially. This shows that 39.5% people were unmindful of their own health issues. Among them 21% were not bothered even to change their dresses after spraying pesticides and enter other walks of life immediately. Studies reveal that wet cotton clothes due to sweat, absorbed more pesticides (Hazarika, 2011). This shows that many of the people in the society are not aware of the health hazards caused by insecticides (Maroni *et al.*, 2000). Among the people participated in the study 51% (lower CI 44.71 and upper CI 57.93) has the habit of consuming alcohol or smoking or chewing. Chewing or smoking while spraying may increase the chances of insecticide entry. Similar observations were made by Antonella *et al.*, (2001) and Chitra *et al.*, (2006). According to Hazarika and Hazarika (2013) smoking during insecticide application was strongly associated with throat cancer, lung cancer, liver cancer and oral cancer. During the present study the tendency of repairing the sprayer by themselves was found to be a common practise among those use such instruments. 88% people involved in the study tried to repair their instrument. Repairing a filled sprayer in the field increases the probabilities of field contamination and the chances of pesticide entry to the person doing the same. Though awareness campaigns were conducted by NGOs and governmental agencies the message was not penetrating deep into the mind of the common public. The present survey covered all sections of the people in the region in which 56.5% are below poverty line and mostly agricultural labourers who are directly involved in all kinds of agricultural activities. The remaining 43.5 % falls under APL category. But most of them were average middle class people actively engaged in agriculture. One hundred and fifteen adult males and eighty five adult female wholeheartedly co-operated with the survey.

Table 1 Survey on the anthropogenic influence, attitudes and risks regarding pesticide application at Road Mukku region of Ward 9, Kinakary, Kuttanad

-Number of individuals participated on the survey

Period of Study	
Total number of Participants	200
Number of Males	115
Number of Females	85

Table 2 Percentage and confidence interval of different information received from the survey

- Measures employed for controlling pest in Kinakary

Procedures used for controlling pests	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
Chemical	84	78.91909929	89.08090071
Organic	3.5	0.952942482	6.047057518
Both	12.5	7.916469701	17.0835303

Table: 3 Whether following the instructions of utilization of insecticides

Whether follow the procedures of application exactly as instructed on the cover of insecticide or by the agricultural department	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
Yes	56.5	49.62915857	63.37084143
No	16.5	11.35570005	21.64429995
Partially	27	20.84703584	33.15296416

Table 4 Dress code during pesticide application

Do you ware any kind of special dress code to protect you from the insecticide	Percentage	95% Confidence Interval	
		Lower CI	Upper CI

Yes	60.5	53.72487506	67.27512494
No	26.5	20.38343381	32.61656619
Partially	13	8.339072195	17.6609278

Table 5 Change of dress after spraying

Do you change your dress soon after spraying the insecticide	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
Yes	79	73.35499584	84.64500416
No	21	15.35499584	26.64500416

Table 6 Repairing the pump during or after spraying

Do you repair your sprayer by yourself during or after spraying	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
Yes	88	83.50	92.50
No	12	7.49	16.50

Table 7 Unhealthy habits if any

Do you have any of the following habits?	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
Yes	51	44.71	57.93
No	49	42.07	55.93
Habits			
Smoking	48.03	38.33408862	57.72591138
Chewing	20.58	12.73408476	28.42591524
Thampak (A type of drug kept under the tongue)	1.96	0	4.650206839
Alcohol consumption	21.56	13.57914985	29.54085015

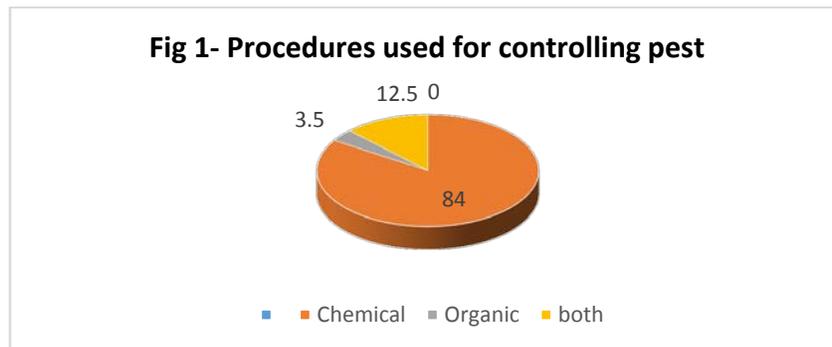
Table 8 Awareness campaign

Awareness campaign sufficient?	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
Yes	31	24.59017067	37.40982933
No	69	62.59017067	75.40982933

Table 9 APL/ BPL

APL / BPL?	Percentage	95% Confidence Interval	
		Lower CI	Upper CI
APL	56.5	49.62915857	63.37084143
BPL	43.5	36.62915857	50.37084143

Figure 1 The percentage of various issues at Kinakary ward 9, Road Mukku region



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