https://doi.org/10.56572/gjoee.2022.33.2.0030 *Gujarat Journal of Extension Education Vol. 33 : Issue 2 : June 2022*

SENSITIZATION AMONGST FARMERS TOWARDS HAZARDOUS EFFECTS OF AGROCHEMICALS

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ABSTRACT

Pesticide poisoning is a huge global health issue that is particularly widespread in developing countries. It can cause a variety of human health problems depending on their toxicity, frequency and duration of exposure. Hazardous effects of agrochemicals will be reduced if the farmers become more sensitive of the proper use pattern of agrochemicals (pesticides) and follow prescribed self-protection mechanisms. The study assessed the sensitization amongst farmers towards hazardous effects of agrochemicals. A questionnaire-based simple random sampling survey was conducted on 120 farmers of Anand and Kheda districts of Gujarat state. The statistical measures, such as SPSS and Microsoft excel were used. Slightly more than three-fourth (76.67 per cent) of the farmers had an average level of sensitization. Training received (0.437) and Social participation (0.364) of farmers had a positive and highly significant correlation with their sensitization towards hazardous effects of agrochemicals. This study will assisted entomologist, pathologist and environmentalist for the implementing the training programmes related to safe handling and use of recommended doses of application of plant protection chemicals.

Keywords**:** *sensitization, agrochemicals, hazardous effects and farmers*

INTRODUCTION

"This is basic problem, to feed 6.6 billion people. Without chemical fertilizer, forget it. The game is over."

(Dr Norman Borlaug).

In India, the increased use of fertilizers and pesticides in agriculture was started since 1970s as a part of the Green Revolution. Insecticides and fungicides are most commonly used for pest control in agriculture. Pesticides and fertilizers are powerful weapon for increasing agricultural productivity, but protection system during the use of agrochemicals are not satisfactory. So, these chemicals have been negatively affecting on the health of the farmers. According to the World Health Organization classification, pesticide toxicity is primarily determined by two factors *i.e*., dose and time. The amount of chemical involved and how often the material is exposed lead to two different kinds of toxicity *i.e*., acute and chronic (World Health Organization, 2020). Generally, farmers do not use the safety masks, gloves and other protective gadgets during the spraying of agrochemicals. Major health problems expressed by the farmers are blood pressure, cough, fever, cold, joint pain, gastric, headache, diabetic, stomach pain and eye problem. Farmers also experienced headache, unhealthy feeling after frequent use of pesticides. Farmers feel that the applying pesticides give them sickness. (Basnet and Chidi, 2019). Due to toxical nature of agrochemicals, it is crucial that protective measure be taken to ensure the safety of farmers or farm workers (Waxman, 1998).. Therefore, there is need to assess the farmers' sensitization towards the hazardous effects of various agrochemicals, which can helps in improving the livelihoods of the farmers.

OBJECTIVES

(1) To study the sensitization amongst farmers towards hazardous effects of agrochemicals

(2) To find out the relationship between the sensitization amongst farmers towards hazardous effects of agrochemicals and their profiles

METHODOLOGY

The present study was carried out in Anand and Kheda districts which is located in middle Gujarat. Two talukas were selected randomly. So, total four talukas namely Anand, Borsad, Nadiad and Matar were selected for the present investigation. From each talukas randomly five villages and from each selected village six farmers were selected randomly for the study. In all, total 120 farmers were selected by the random sampling procedure. Ex-Post-Facto research design was used in the present study (Kerlinger, 1976). To know the overall sensitization, *viz*, farmers' knowledge about different agrochemicals used, perception of the farmers on hazardous effects of agrochemicals, agrochemicals (pesticides) use

pattern and farmers' exposure on hazardous effects of agrochemicals were identified. For this, 25 experts were requested to give their opinion to assign weightage in a way that, the total score for above four indicators becomes 100. Thereafter, mean scores were worked out. The data collected through interview survey were coded, tabulated and analyzed using SPSS and Microsoft excel.

RESULTS AND DISCUSSION

The sensitization of the farmers is operationalized as the combination of a body of knowledge, perception, agrochemicals (pesticides) use pattern and exposure that an individual possesses to perform a given task effectively and efficiently. The findings together with appropriate discussion, are presented in main headings below.

Sensitization amongst farmers towards hazardous effects of agrochemicals

Table 1: Distribution of the farmers according to their overall sensitization (n = 120)

Sr. No.	Categories	Frequency	Per cent
1	Poor (00.00 to 20.00 score)	00	00.00
2	Below average (20.01 to 40.00 score)	01	00.83
3	Average (40.01 to 60.00 score)	92	76.67
4	Good (60.01 to 80.00 score)	27	22.50
5	Excellent (80.01 to 100.00 score)	00	00.00

It was evident form the Table 1 that slightly more than three-fourth (76.67 per cent) of the farmers had an average level of sensitization, followed by 22.50 per cent and 0.83 per cent of them had good and below average level of sensitization towards hazardous effects of agrochemicals. Further, none of the farmers had poor and excellent level of sensitization towards hazardous effects of agrochemicals. The findings of the study is in concurrence with Jasna *et al*. (2019).

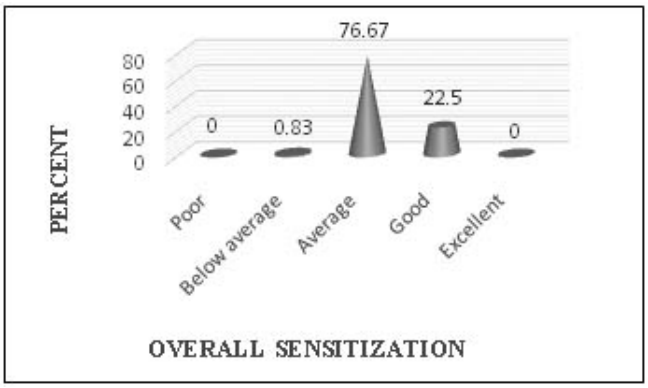

Fig. 1: Distribution of the farmers according to their sensitization towards hazardous effects of agrochemicals

As per result, it can be inferred that the vast majority (99.17 per cent) of the farmers had an average to good level sensitization towards hazardous effects of agrochemicals. Moderate education, scientific orientation and change to proneness may all contribute to this trend of results.

Relationship between the sensitization amongst farmers towards hazardous effects of agrochemicals and their profiles

To determine the relationship between the farmers' sensitization and their personal, socio-economic, communicational and psychological characteristics. The association between sensitization and their profiles was calculated by using Karl Pearson's (r), a statistical method. The outcome is displayed visually in Table 2.

(1) Age and sensitization

The age of the farmers and their sensitization towards hazardous effects of agrochemicals exhibited a negative and non-significant relationship (r = - 0.033), as shown in Table 2. To summarise the findings of the study, it can be claimed that farmers' sensitization was seen as average to good, regardless of their age.

(2) Education and sensitization

It is clear from the Table 2 that there was a positive and significant correlation (r = 0.234*) between education of the farmers and their sensitization towards hazardous effects of agrochemicals. It indicates that education is an essential component that determines farmers' sensitization towards hazardous effects of agrochemicals. It also shows that farmers with higher level of education are more conscious and sensitive towards ill effects caused through agrochemicals.

Table 2: Relationship between sensitization amongst farmers towards hazardous effects of agrochemicals and their profiles (n = 120)

Sr. No.	Independent variables	' r ' Value
A	**Personal variables**	
X_1	Age	-0.033
X_2	Education	0.234*
X_3	Gender	-0.008
X_4	Farming experience	-0.111
B	**Socio-economic variables**	
X_5	Land holding	0.216*
X_6	Annual income	0.363**
X_7	Occupation	0.362**
X_8	Herd size	0.113
C	**Communicational variables**	
X_9	Social participation	0.364**
X_{10}	Agricultural farm media exposure	0.028
X_{11}	Training received	0.437**
X_{12}	Information seeking behavior	0.201*
D	**Psychological variables**	
X_{13}	Scientific orientation	0.352**
X_{14}	Proneness to change	0.339**

** Significant at 0.01 level of probability
* Significant at 0.05 level of probability

(3) Gender and sensitization

It is apparent from the data dispense in Table 2 that gender had a negative and non-significant correlation (r = - 0.008) with their sensitization towards hazardous effects of agrochemicals. It indicates that gender did not play any significant role in their sensitization towards hazardous effects of agrochemicals.

(4) Farming experience and sensitization

The data illustrated in Table 2 reflect that farming experience had a negative and non-significant correlation (r = - 0.111) with their sensitization towards hazardous effects of agrochemicals. From the above findings, it can be concluded that the level of sensitization of the farmers is more or less similar across the different level of farming experience. It means that farming experience of the farmers did not play significant influence in developing their level of sensitization.

(5) Land holding and sensitization

The data depicted in Table 2 revealed that there was a positive and significant correlation (r = 0.216*) between land holding of the farmers and their sensitization towards hazardous effects of agrochemicals.

It is natural that someone who is reliant on a tiny piece of land to have limited resources to generate more income, such a person always try to gain a variety of skills that will enable him to be more confident and capable of participating in various income-generating activities. A similar situation was found here, and it was discovered that farmers with marginal size of land holding expressed an increase level of sensitization and degree of concern about safe pesticides use practices.

(6) Annual income and sensitization

A perusal of data presented in Table 2 portiere that there was positive and highly significant (r = 0.363**) correlation between annual income of the farmers and their sensitization towards hazardous effects of agrochemicals.

The probable reasons might be the farmers with a more annual revenue have more financial resources to spend in better scientific agrochemicals application practices. There will also be more access to information sources and social contacts, which will lead to the acquisition of recommended plant protection measures.

(7) Occupation and sensitization

It is apparent from the Table 2 that there was a positive and highly significant correlation (r = 0.362**) between occupation of the farmers and their sensitization towards hazardous effects of agrochemicals. As a result of the findings, it can be concluded that in order to supplement their income from source other than agriculture, farmers became more cautious and sensitive in their understanding of adverse effects of agrochemicals, which may have directly or indirectly aided them in gaining more knowledge about of different type of agrochemicals used on their farm.

(8) Herd size and sensitization

The data presented in Table 2 signifies that the sensitization of the farmers towards hazardous effects of agrochemicals was positively but non-significant correlation (r = 0.113) with their herd size. The results indicates that the herd size possessed by the farmers did not play significant role in increasing their level of sensitization towards hazardous effects of agrochemicals.

(9) Social participation and sensitization

It is clear from the data illustrated in Table 2 that social participation of the farmers and their sensitization towards hazardous effects of agrochemicals had a positive and highly significant correlation (r = 0.364**). It is obvious that farmers with a high level of social engagement and participation to develop stronger relationships with other

individuals in order to learn new skills and techniques that will reduce the ill effects of agrochemicals.

(10) Agricultural farm media exposure and sensitization

The data presented in Table 2 clearly shows that farmers' exposure to agricultural farm media and their sensitization of the farmers towards hazardous effects of agrochemicals had a positive but non-significant correlation (r = 0.028). The findings revealed that the farmers' exposure to agricultural farm media did not play any significant role in their sensitization towards hazardous effects of agrochemicals.

(11) Training received and sensitization

The data presented in Table 2 demonstrate that training received of the farmers had positive and highly significant correlation (r = 0.437**) with their sensitization towards hazardous effects of agrochemicals. The findings revealed that training plays a crucial role in influencing farmers' opinions and acquire skills from training related to different practices of safe-use of agrochemicals.

(12) Information seeking behaviour and sensitization

The data depicted in Table 2 revealed that information seeking behaviour of the farmers had a positive and significant correlation (r = 0.201*) with their sensitization towards hazardous effects of agrochemicals. The probable reason for the positive and significant relationship between sensitization and information seeking behaviour is that may have a favourable propensity to acquire more skill and aims to address farm problems as a result of seeking information from various information sources.

(13) Scientific orientation and sensitization

A perusal of data presented in Table 2 clearly indicated that there was positive and highly significant (r = 0.352**) correlation between scientific orientation of the farmers and their sensitization towards hazardous effects of agrochemicals. Farmers with a high scientific orientation develop trustworthiness in the application of scientific methods in agriculture, which builds their confidence level and leads to the formation of positivism about scientifically proven environmentally friendly technology, which develop to better sensitization among those farmers having high scientific orientation.

(14) Proneness to change and sensitization

The data depicted in Table 2 portiere that there was positive and highly significant (r = 0.339**) correlation between proneness to change of the farmers and their sensitization towards hazardous effects of agrochemicals. It can be inferred from the result that farmers with a high sensitization towards hazardous effects of agrochemicals are psychologically involved in collecting information to get the guidance about new scientific management practices and adopt better utilization pattern of agrochemicals, which are ultimately reduce risk exposure of pesticides.

CONCLUSION

The result concluded that slightly more than three-fourth (76.67 per cent) of the farmers had an average level of sensitization towards hazardous effects of agrochemicals. It also concluded that out of fourteen independent variables, six variables *viz*. occupation, annual income, social participation, training received, scientific orientation and proneness to change had positively and highly significantly correlated with sensitization towards hazardous effects of agrochemicals. While, education, land holding and information seeking behaviour were positively and significantly correlated with sensitization towards hazardous effects of agrochemicals. Rest variables *viz*. age, gender, farming experience, herd size and agricultural farm media exposure failed to show any significant relationship with developing their sensitization towards hazardous effects of agrochemicals.

CONFLICT OF INTEREST

The authors of the paper declare no conflict of interest

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Received : May 2022 : Accepted : June 2022