

Farmers Perception on Pesticide use with Respect to their Socio-economic Variable

Ganesh Das

Subject Matter Specialist (Agricultural Extension), Cooch Behar Krishi Vigyan Kendra,
Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar
E-mail: ganesh.ext@gmail.com

Abstract—Pesticide was essential for cultivation of different crop. Farmers were use different pesticide on crop field. Their perception on pesticide use may be different. Different government and private organisation took initiative to aware the farmer about the use of pesticide. But still a problem was found by Cooch Behar Krishi Vigyan Kendra that farmer perception of pesticide use were not homogeneous and the different sources of information may be use by the farmers for pesticide application. So a study was conducted at Gopalpur village in Cooch Behar district, West Bengal to know the farmer perception on pesticide use and sources of information utilize for pesticide application. The data were collected during June, 2016. The research design was followed in the study was survey research method. The sample size of the study was 100. The dependent variable of this study was perception and independent variables were age, gender, number of family member, caste, land holding, education, annual income and sources of information. The descriptive statistics like frequency, percentage and other statistical tools were used for the investigation. This study had shown the relation of the perception of pesticide use with the different independent variable.

Keywords: Pesticide, Perception, Information, Aware

1. INTRODUCTION

Pest control without any chemical pesticide cannot meet the increasing crop production in India. One of the reasons is due to the increasing the infestation of pests and diseases on crop cultivation. So requiring pest management effectively to increase the amount of producing crop can satisfy a large demand in the Indian market. Use of chemical pesticides is one of the popular and effective ways to control the pest and diseases. Farmers may use one or more pesticide. Farmers' preference of the pesticide may not be equal. There is several type of harmful pest and diseases on crop field. Some sociological and economical factor may influence on the perception of use pesticide. Farmers of Cooch Behar district were more interest to used pesticide on agriculture field. Agriculture production of Cooch Behar district was increased due to use of pesticide and other modern technology. However, besides the benefits that it brings, pesticides potentially affect the health of users and the surrounding environment. If not used properly, pesticides cause human poisoning and is accumulated as residues in food and the environment, which result in the variety of human diseases,

environmental pollution and loss of biodiversity. Different Government organization were aware the farmer on safe use of pesticide by arranging different awareness and training programme. But farmer Perception about pesticide used may be different. Coochbehar Krishi Vigyan Kendra organized so many awareness and training programmes on integrated pest management, safe use of pesticide in on campus and off campus. Farmers' perception of pesticide was not homogeneous in Coochbehar district. So a study was conducted to know the farmers' perception on pesticide use with respect to their socio-economic and other variable. Consumers' attitude is associated with the knowledge and personal experience they possess [1]. Farmers' perceptions of the characteristics of modern rice varieties significantly affected adoption decisions. Farmer characteristics among others include sex, age, education, and household size while institutional factors include farm size, membership to association, access to information, access to credit, and access to infrastructure such as roads or storage [2]. Educated farmers were believed to have higher ability to perceive, interpret and respond to new information about improved technologies than their counterparts with little or no education [3, 4]. It was found from most of the studies that a positive relationship exist between access to credit and use of improved technologies and access to extension services and use of improved technologies [5-7]. Anonymous concluded from their study that most of the vegetable farmers perceived that frequency of insects and disease infestation had increased over the past 10 years and most of the pesticides belonged to high and moderate risk chemicals [8]. Anonymous found that farmer perceptions of toxicity level of chemicals they handle had not been found in conformity with the actual situation and they handle toxic chemicals thinking them to be safe [9] and greater number of the literate farmers had strong perception on the negative impacts of pesticides on soil, water, air and beneficial organisms [10]. Perception as the process by which an individual maintains contact with the environment [11]. Land ownership and agricultural credit had positively impacted on pesticide use [12] and younger farmers were the most pesticides-effected group and well-targeted training

programs [13]. The vegetable farmers in Tanzania were lack of appropriate knowledge on safe use of pesticides [14]. Anonymous showed that Non- Integrated Pest Management farmers used twice as many pesticides as IPM farmers and integrating rice-fish farming with IPM practices was a sustainable alternative to intensive rice mono-cropping in terms of an economic and an ecological point of view [15]. The study was conducted during June,2016. The purpose of this study was to identify the farmer Perception on pesticide use with respect to their socio-economic variable.

2. MATERIAL AND METHOD

The study was conducted at Gopalpur village, Cooch Behar district, West Bengal during June, 2016. Survey research design was used in this study. The data was collected by pretested well structure interview schedule. The respondents for this study were included from the farmers and farm women of Gopalpur village. Purposive sampling method was used for selection of village. Random sampling method was used for selection of the respondent. The sample size for the study was 100. The dependent variables of this study were perception and independent variables were age, gender, number of family member, caste, land holding, education, annual income and sources of information. There were fifteen number of perception statement were selected but after pre-test finally nine number of perception statement were selected. The variables were selected based on recommendation of the scientist of Uttar Banga Krishi Viswavidyalaya, Cooch Behar, West Bengal. The descriptive statistics like frequency, percentage and Pearson's product moment correlation were used for the investigation.

3. RESULTS AND DISCUSSION

It was shown from the study that a majority of the respondent were male (65%) farmer followed by female (35%) farmer. It was shown that the majority percentage of the respondent age group belonged to 35yrs to <50yrs (40%) followed by 25yrs to <35yrs (25%). This type of age group may take more initiative to safe use of pesticide (Ntow et al. 2006). It was found that majority of respondent land holding size were 2 to 5 acre (40%) followed by less than 2 acre (30%). It was shown that majority of respondent were SC (50%) category followed by ST (20%) and GEN (20%) category. It was observed that the majority percentage of the respondents Annual income level were Rs.1,00,001 to Rs.2,00,000 (35%) followed by Rs.60,001-Rs.1,00,000 (25%). It was observed that the majority percentage of the respondents educational level were primary school (30%) pass followed by middle school (20 %) pass and can read and write only (20%). It was found from the study that majority of the respondents family size were less than 5 (65%) followed by more than 5 (35%). It was shown after investigation that majority of the respondent perception agree with the statement of "Prescribed dosage of pesticide is applied on the field" (80%) followed by "Mixing of pesticides is more effective" (45%). It was found from the survey that

majority of respondent perception were not agree with the statement of "Chemical pesticide is environmentally friendly" (88%) followed by "Only used of pesticide can control the entire pest of the field" (72%). It was also found from the study that majority of respondent perception unknown with the statement of "Pesticide apply at the time of above ETL" (95%) followed by "Pesticide is applied on the basis of agro climatic condition (70%)". It was revealed from the survey that there exist a positive and significant association between the variable of land holding (x_5) and perception statement of y_3 , y_4 , y_6 and negative and significant association of the perception statements of y_1 , y_2 , y_5 , y_7 , y_8 and y_9 . The findings are line with the statement found by Rahman (2003). The variables caste (x_4) had no significant association with any of the perception statements. The variable gender (x_1) had positive and significant association with the statements of y_1 , y_2 , y_4 , y_6 and y_7 . The variable age (x_2) had positive and significant association with the statements of y_4 , y_7 and y_8 and negative and significant association with the statement of y_9 . The findings are line with the statement found by Adesina and Zinnah 1993. The variable education (x_3) had negative and significant association with the statements of y_1 , y_3 , y_5 , y_7 and y_8 and positive and significant association with the statements of y_6 and y_9 . The findings are line with the statement found by Lanyintuo and Mekuria 2005; Tabi *et al.* 2010. The variables Annual income (x_6) had positive and significant association with the statements of y_4 , y_6 and y_9 and negative and significant association with the statement of y_1 . The findings are line with the statement found by Feder *et al.* 1985. The variables family size (x_7) had positive and significant association with the statements of y_4 and y_6 and negative and significant association with the statements of y_1 , y_2 , y_5 , y_7 and y_9 . The findings are line with the statement found by N. Mahantesh et al. 2009. It was observed from the study that majority percentage of respondent used pesticide retailer (95%) as sources of information of pesticide dosages followed by Agriculture office (70%).

4. CONCLUSION

It can be concluded from the investigation that the majority of the respondent perception were high in the statements of "Prescribed dosage of pesticide is applied on the field", "Chemical pesticide is environmentally friendly" and "Only used of pesticide can control the entire pest of the field. It was concluded from the survey that respondent perception were low in case of "Pesticide apply at the time of above ETL" and "Pesticide is applied on the basis of agro climatic condition". It was concluded from the study that there exist a positive and significant association between the variable of land holding (x_5) and perception statements of y_3 , y_4 , y_6 and negative and significant association of the perception statements of y_1 , y_2 , y_5 , y_7 , y_8 and y_9 . The variables caste (x_4) had no significant association with any of the perception statements. The variable gender (x_1) had positive and significant association with the statements of y_1 , y_2 , y_4 , y_6 and y_7 . The variable age (x_2) had

positive and significant association with the statements of y4, y7 and y8 and negative and significant association with the statement of y9. The variable education(x₃) had negative and significant association with the statements of y1 y3, y5, y7 and y8 and positive and significant association with the statements of y6 and y9. The variables Annual income (x₆) had positive and significant association with the statements of y4, y6 and y9 and negative and significant association with the statement of y1. The variables family size (x₇) had positive and significant association with the statements of y4 and y6 and negative and significant association with the statements of y1, y2, y5, y7 and y9. It was also clear from the study that pesticide retailer was play major role for pesticide dosage information provider to the respondents.

REFERENCES

- [1] Davidson, A. R., Yantis, S., Norwood, M. and Montano, D. E. (1985). Amount of Information about the Attitude Object and Attitude Behavior Consistency. *Journal of Personality and Social Psychology*, **49**(5), pp. 1184-1198.
- Deininger, K., & Okidi, J. (2001). Rural Households: Incomes, Productivity, and Nonfarm Enterprises. In Reinikka, R., & Collier, P. (Eds.), *Uganda's Recovery: The Role of Farms, Firms, and Government*, 123 - 175. Kampala, Uganda: Fountain Publishers.
- [2] Adesina, A.A. and Zinnah, M.M., 1993a. Technology characteristics, farmer perceptions and adoption decisions: a tobit model application in Sierra Leone. *Agric. Econ* **9**: 297-311.
- [3] Lanyintuo, A., & Mekuria, M. (2005). Modeling Agricultural Technology Adoption Using the Software STATA. CIMMYT-ALP Training Manual No. 1/2005 (Part Two). Harare, Zimbabwe: International Maize and Wheat Improvement Centre.
- [4] Tabi, A. J., Vabi M. B., & Malaa, D. K. (2010). Adoption of Maize and Cassava Technologies in the Forest-Savannah Zone of Cameroon: Implications for Poverty Reduction. *World Applied Sciences Journal* **11**(2): 196-209.
- [5] Feder, G., Just, R. E., & Zilberman, D. (1985). Adoption of Agricultural Innovations in Developing Countries: A Survey. *Economic Development and Cultural Change*, **33**(2): 255-298.
- [6] Feder, G., & Slade, R. (1984). The Acquisition of Information and Adoption of New Technology. *American Journal of Agricultural Economics*, **66**: 312-320.
- [7] Akramov, T. K. (2009). Decentralization, Agricultural Services and Determinants of Input Use in Nigeria. Discussion Paper 0094, IFPRI.
- [8] N. Mahantesh and Singh, Alka (2009) A Study on Farmers' Knowledge, Perception and Intensity of Pesticide Use in Vegetable Cultivation in Western Uttar Pradesh. *PusaAgriScience*, **32**. pp. 63-69.
- [9] P. Indira Devi (2009), Health Risk Perceptions, Awareness and Handling Behaviour of Pesticides by Farm Workers, *Agricultural Economics Research Review*, **22**. 2009 pp 263-268
- [10] P.K Shetty, M. Murugan, M.B. Hiremath1, and K.G. Sreejal (2010), Farmers' education and perception on pesticide use and crop economies in Indian agriculture, *Journal of Experimental Sciences*, **1** (1).
- [11] Gibson J.J. 1997. Perception as a Function of Stimulation, in *Psychology: A Study of Science*, (ed.) Sigmund Koch. McGraw-Hill, New York. <http://dx.doi.org/10.1037/0022-3514.49.5.1184>
- [12] Rahman, S. (2003). Farm-level pesticide use in Bangladesh: determinants and awareness. *Agriculture Ecosystems & Environment*, **95**(1), 241-252. doi: Pii S0167-8809(02)00089-0
- [13] Ntow, W. J., Gijzen, H. J., Kelderman, P. & Drechsel, P. (2006). Farmer perceptions and pesticide use practices in vegetable production in Ghana. *Pest Management Science*, **62**(4), 356-365. doi: Doi 10.1002/Ps.1178
- [14] Ngowi, A., Mbise, T. J., Ijani, A. S. M., London, L. & Ajayi, O. C. (2007). Smallholder vegetable farmers in Northern Tanzania: Pesticides use practices, perceptions, cost and health effects. *Crop Protection*, **26**(11), 1617-1624. doi: DOI 10.1016/j.cropro.2007.01.008
- [15] Berg, H. (2001). Pesticide use in rice and rice-fish farms in the Mekong Delta, Vietnam. *Crop Protection*, **20**(10), 897-905. doi: Doi 10.1016/S0261-2194(01)00039-4

Table 1: Classification of the respondent on the basis of different independent variable

n=100

Sl. No.	Variable	Number of respondent
A.	Gender (x₁)	
1.	Male	65
2.	Female	35
B.	Age (x₂)	
1.	18yrs to <25 yrs	20
2.	25 yrs to <35 yrs	25
3.	35 yrs to <50 yrs	40
4.	>50 yrs	15
C.	Education (x₃)	
1.	Illiterate	10
2.	Can read only	-
3.	Can read and write only	20
4.	Primary school	30

5.	Middle school	20
6.	High school	15
7.	Pre-university	-
8.	Graduate and above	5
D.	Caste (x₄)	
1.	GEN(General)	20
2.	SC(scheduled caste)	50
3.	ST(scheduled tribe)	20
4.	OBC(Other Backward classes)	10
	Land holding (acre) (x₅)	
1	Less than 2	30
2	2-5	40
3	5-10	20
4	More 10	10
	Annual income level (INR) (x₆)	
1	Less than Rs. 30,000	10
2	Rs. 30,001-Rs. 60,000	15
3	Rs.60,001-Rs.1,00,000	25
4	Rs. 1,00,001-Rs. 2,00,000	35
5	Rs. 2,00,001-Rs. 3,00,000	10
6	Rs. 3,00,001 and above	5
	Number of family member (x₇)	
1	Less than 5	65
2	More than 5	35

Table 2: Perception of the farmer on pesticide use

n=100

Perception	Yes		No		Don't Know	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
using of pesticide is economically viable (y ₁)	40	40	20	20	40	40
Mixing of pesticides is more effective (y ₂)	45	45	20	20	35	35
Prescribed dosage of pesticide is applied on the field (y ₃)	80	80	17	17	3	3
Only used of pesticide can control the entire pest of the field (y ₅)	26	26	72	72	2	2
Pesticide apply at the time of above ETL (Economic Thresh hold level) (y ₅)	5	5	0	0	95	95
Chemical pesticide is environmentally friendly (y ₆)	12	12	88	88	0	0
Bio pesticide is more effective than chemical pesticide (y ₇)	34	34	13	13	53	53
Pesticide is applied on the basis of agro climatic condition (y ₈)	20	20	10	10	70	70
frequency of insects and disease infestation has increased over the past 10 years (y ₉)	34	34	6	6	60	60

Table 3: pesticide dosage information used by the respondent

n=100

Sources of information	Frequency	Percentage
Agriculture office	70	70
Own experience	25	25
Other farmer	22	22
Pesticide Retailer	95	95
Pesticide company representative	12	12

Table 4: Association between personal and socio-economic traits with Perception of respondent

n=100

SL No	Variable	'r' value																	
		Y ₁	LOS*	Y ₂	LOS	Y ₃	LOS	Y ₄	LOS	Y ₅	LOS	Y ₆	LOS	Y ₇	LOS	Y ₈	LOS	Y ₉	LOS
1.	x ₁	0.491	.01	0.601	.01	0.12	NS**	0.417	.01	0.072	NS	0.206	.05	0.504	.01	0.174	NS	-	NS
																		0.031	
2.	X ₂	0.069	NS	0.011	NS	0.01	NS	0.261	.01	0.070	NS	-	NS	0.307	.01	0.247	.05	-	.01
												0.031						0.546	
3.	X ₃	-	.01	0.015	NS	-0.54	.01	0.113	NS	-	.01	0.526	.01	-0.715	.01	-	.01	0.332	.01
		0.781								0.449						0.471			
4.	X ₄	-	NS	-	NS	-0.10	NS	-	NS	0.050	NS	0.151	NS	0.0347	NS	-	NS	-	NS
		0.021		0.022				0.059								0.024		0.068	
5.	X ₅	-	.01	-	.01	0.211	.05	0.683	.01	-	.01	0.470	.01	-0.601	.01	-	.01	-	.01
		0.458		0.590						0.462						0.702		0.535	
6.	X ₆	-	.05	0.014	NS	-	NS	0.449	.01	0.068	NS	0.205	.05	-0.089	NS	-	NS	0.417	.01
		0.196				0.044										0.112			
7.	X ₇	-	.01	-	.01	-	NS	0.417	.01	-	.01	0.296	.01	-0.450	.01	0.105	NS	-	.01
		0.688		0.621		0.054				0.312								0.410	

- *LOS: Level Of Significance
- ** NS : NON Significance