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Sociological Analysis of the Farmers Adopting Plant Protection Technique in West Bengal, India

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A B S T R A C T

The present study was conducted with the objective to study the sociological characteristics of farmers adopting plant protection technique in West Bengal. This study was conducted on 120 farmersin 12villages from 3 blocks of Paschim Medinipur district viz. Suttchara, Gogram, Mundumari and Bajpur villages from Pingla block, Chakbadalpur, Banhola, Nandapura and khunkhunya villages from Sabang block and Tutranga, Tulya Chak, Barkhabad, Baicha villages from Narayangarh block. It was aimed to analyses the sociological characteristics of the widespread practice of farmers adopting plant protection technique in West Bengal. The study was undertaken during August 2017 to December 17 and the data pertain of the year 2017. In the present study, data was generated through a sample survey of farmers by personal interview method using pretesting well-structured interview schedule. Simple random sampling method was adopted for selecting the respondents. The finding of the study reported that thee farmers engaged in plant protection techniques have the following parameters with majority of age group showing 41-55 years (55.83%), general category (45%), education for respondent high school (41.67%), education for family as high school (51.67%), family size as 3-4 members (47.5%), landholding upto 1 acre (72.50%), housing type as brick house (42.50%), production on Kharif season as less than 30 quintal (65.83%) and Boro season as less than 30 quintal (51.67%), primary occupation (100%), secondary occupation as no occupation (36.67%), annual income Rs.50001-100000 (44.17%), agricultural implementation as below 10000 index (95.83%), cosmopoliteness as 26-50 index (57.50%), media exposure 51-75 index (36.67%) and social participation as 0-25 index (63.33%). The study concluded that understanding the sociological character of the farmers will help in making the concern agents and department to closely work with the farmers and develop improve technics to improve their practice.

Introduction

The significance of agriculture to our nation is best summed up by the statement: "If Agriculture goes wrong, nothing will go right." Agriculture will continue to play an important role in the economic development and poverty alleviation in the era of economic liberalization and globalization. The agricultural sector contributes 14% to the country's total GDP and it is the predominant occupation, accounting for about 52% of employment. The grain output after the Green Revolution resulted in a record 131 million tons in 1978-79. In India, 70% of people live in rural area and the majority of them are poor. This people mainly depend on agriculture.

However, Due to limited resources in land, water, improved input and technologies, and microfinance resulted in continuing of poverty**.** Today we have faced various type of problem in the agriculture field and that is the reason why farmers are not producing good quality of crops. In this time farmers used a different type of chemical to control insect,

pest population and also have used chemical fertilizer for higher crop production. Modernizing agriculture heavily rests on sophistication in farm technology. But this in itself cannot produce their result unless the latest technologies are carried to its prospective users, i.e. farmers. Insects appeared on the earth 250 million years ago, while primitive man entered the scene only one million years ago. This gives an idea about the immense degree of evolutionary maturity of insects 'vis-àvis' that of man.

The effect of damage and loss due to the attack of pests and diseases are enormous and may result in complete damage to the crops. 9,000 species of insects and mites, 50,000 species of plant pathogens, and 8,000 species of weeds damage crops worldwide approximately. Insect pests cause an estimated 14% of loss, plant pathogens cause a 13% loss and weed a 13% loss (Pimentel, 2009).

There is a strong research background to support the fact that pests and diseases caused complete elimination of crops and farmers out of distress had to migrate to other places to escape from the menace of pests and diseases. The classic examples of pests and diseases attack can be highlighted by giving some examples like the late blight of potato famine of Ireland in 1840s, coffee rust in Sri Lanka towards the end of 19thcentury, Bengal famine of rice crop due to brown spot disease in 1943, Citrus decline in orange plantations, etc. The average total loss of crops and stored food in India due to damage by pests, diseases, and weeds is approximately 18% of our total annual production, the cash value of which is about Rs.5000 cr. annually Mehta (1989).

Rice is damaged by more than 100 species of insect pests of which about dozen are of significance in India. Some of the important diseases of paddy crop in India include fungal, bacterial and viral diseases. Among them, blast, brown spot, bacterial blight, foot rot, stem rot, and false smut are important. The coordinated network trials conducted at different centers of India have indicated that controlling insect pests alone increases yield by around one ton per hectare. A survey by All India Rice Development Project revealed that weeds cause 15- 20% yield loss in transplanted rice and 30-35% in broadcasted rice and more than 50% in direct-seeded upland rice.

Insect pest plays a major role in the devastation of crop yield, although all are not insects. Mammals like rodents, snails, birds also damage crop to a larger extent. A rodent spoils 10 times more crop than it consumes. A rodent consumes about 3 kgs of grain in a year. All of them grow their population intensively within a very short period of time and lay eggs very frequently. Larvae hatched from those eggs feed on crop plant voraciously. Pathak (1970) showed that controlling insect pest can save crop more than 80%. More than 70 insect pests are there found to damage in the different crop field. In spite of the large extent of pesticide use, the yield loss is still unabated. A number of reasons are there behind this. Indiscriminate use of pesticides develops resistance in pests and pathogens. Besides this, new varieties of weeds, insect pest and diseases are being developed. For example, Brown plant hopper and sheath rot in rice, fruit borer of cotton and vegetables, whitefly, sugarcane stem borer, mustard aphid, *Phalaris minor* in wheat, etc. the problem of nematode and rodent has been increased to a dangerous level. Besides these, another big reason is the inappropriate and injudicious use of pesticides which results in the only pollution without controlling any disease or pest. Furthermore, a farmer without being aware of resistance development of diseases and pests keeps applying the same chemical year after year which results in the total spoil of money and environment.

The main objectives of this study to explore the different sociological character of the farmers adopting plant protection technique.

Materials and Methods

The study was conducted in 12 village's viz. Suttchara, Gogram, Mundumari, Bajpur, Chakbadalpur, Banhola, Nandapura and Khunkhunya, Tutranga, Tulya Chak, Barkhabad and Baicha with 120 sample respondents' farmers from 3 blocks Pingla, Sabang and Narayangarh of Paschim Medinipur districts in West Bengals. Simple random sampling technique was adopted in studying the respondent's farmers. It may be terms as multistage random sampling procedure. The district, blocks and villages were purposively selected for the study.

Sociological profile of the farmers was studied by measuring different component of their sociological status. For this purpose the sociological scale has age, caste, education, family education, family size, land holding, housing pattern, production, occupation, annual family income, agricultural implementation, cosmopoliteness, media exposure and social participation which were develop according to the need of the study. The data collected were tabulated and statistical tools like frequency and percentage were used for logical conclusion of the study.

Results and Discussion

The sociological status of the farmers adopting plant protection were identified in terms of age, caste, education, family education, family size, land holding, housing pattern, production, occupation, annual family income, agricultural implementation, cosmopoliteness, media exposure and social participation are discussed according to the 3 different block. The data of the combine sociological status are presented and discussed below with separate tables with frequency and percentage.

Analysis of the data from table 1 on age is represented in four class interval, i.e., up to 25 years, 26-40 years, 41-55 years, and 56-70 years respectively. From the table it can be observed that majority of household fall under the age group 41-55 years (55.83%) in first category followed by the age group 26-40 years (16.67%) in second category, age group up to 25 years (2.5%) in third category and age group of 56-70 (15%) in fourth category who are engaged in cultivation.

Analysis of the data from table 2 on caste indicates that the majority of the respondents belongs to General caste (45%) in first category, followed by Schedule Caste (29%) in second category, Schedule Tribes (14.17%) in third category and OBC (11.67%) in fourth category.

Analysis of the data from table 3 on education indicated that majority of the respondents (41.67%) were high school in first category, middle school respondents (32%) in second category, primary school (18%) in third category, graduation level (5%) in fourth category.

Analysis of the data from table 4 on family education indicated that majority of the respondent (51.67%) were high school in first category, primary school (27.50%) in second category, Middle school(18.33%) in third category, can read and write only (1.67%) in fourth category and graduate (0.83%) in fifth category.

Analysis of data from table 5 on family size indicated that majority of the respondents from Sabang Block with (60%) were 3-4 member in first category, 5-6 members (25%) in second category, 7-8 members (7.5%) in third category, more than 8 (5%) in fourth category and up to 2 member(2.5%) in fifth

category. In Pingal Block with (47.5%) were 5-6 members in first category, 3-4 members (37.5%) in second category, 7-8 members (10%) in third category and more than 8 members in fourth category. In Narayangarh Block with (50%) were 5-6 members in first category, 3-4 members (45 %) in second category and 7-8 members in third category.

Taking all these three blocks together, it can be found that majority of the respondents with 3-4 members (47.50%) in first category, 5-6 members (40.83%) in second category and 7-8 members (7.50%) in third category.

Analysis of data from table 6 on land holding indicated that majority of the respondents (72.5%) were up to 1.0 acre in first category, 1.1 to 2 acre (21.67%) in second category, more than 3 acre (3.33%) in third category and 2.1 to 3 acre (2.50%) in fourth category.

Analysis of data from table 7 on housing pattern indicated that majority of the respondents (42.5%) were brick house in first category, mixed category (29.17%) in second category, mud house (13.33%) in third category, hut (8.33%) in fourth category and manson (6.67%) in fifth category.

Analysis of data from table 8 on area and production in two season of Kharif and Boro on three blocks with same area were found out with majority of the respondents (72.5%) having up to 1 acre in first category, 1.1 to 2 acre land (21.67%) in second category, more than 3 acre (3.33%) in third category and 2.1 to 3 acre land (2.50%) in fourth category.

Table.1 Distribution of the respondents on the bases of age: (N=120)

Age	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Up to 25	2	5	1	2.5	0	0	3	2.5
26-40	19	47.5	10	25	3	7.5	32	26.67
41-55	12	30	21	52.5	34	85	67	55.83
56-70	7	17.5	8	20	3	7.5	18	15

Table.2 Distribution of respondent according to their caste: (N=120)

Caste	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
GEB	23	57.5	19	47.5	12	30	54	45
SC	12	30	10	25	13	32.5	35	29.16
ST	5	12.5	5	12.5	7	17.5	17	14.17
OBC	0	0	6	15	8	20	14	11.67

Table.3 Distribution of the respondents according to their educational level: (N=120)

Education	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Illiterate	2	5	0	0	0	0	2	1.67
Can read only	0	0	0	0	0	0	0	0.00
Cab read & write	1	2.5	0	0	0	0	1	0.83
Up to primary	7	17.5	7	17.5	8	20	22	18.33
Up to class VIII	14	35	12	30	13	32.5	39	32.50
Up to school (IX-XII)	15	37.5	17	42.5	18	45	50	41.67
Graduate & above	1	2.5	4	10	1	2.5	6	5.00

Table.4 Distribution of the respondent according to their Family Educational level: N=120

Education	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Illiterate	0	0	0	0	0	0	0	0
Can read only	0	0	0	0	0	0	0	0
Cab read & write	2	5	0	0	0	0	2	1.67
Up to primary	19	47.5	11	27.5	3	7.5	33	27.50
Up to class VIII	7	17.5	5	12.5	10	25	22	18.33
Up to school (IX-XII)	12	30	23	57.5	27	67.5	62	51.67
Graduate & above	0	0	1	2.5	0	0	1	0.83
Total	40	100	40	100	40	100	120	100

Table.5 Distribution of the respondent according to their size of their family: N=120

No. of family members	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Up to 2 members	1	2.5	0	0	0	0	1	0.83
3-4 members	24	60	15	37.5	18	45	57	47.50
5-6 members	10	25	19	47.5	20	50	49	40.83
7-8 members	3	7.5	4	10	2	5	9	7.50
>8 members	2	5	2	5	0	0	4	3.33
Total	40	100	40	100	40	100	120	100

Table.6 Distribution of the respondent according to their land holding: N=120

Land in (acre)	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Up to 1.0	34	85	28	70	25	62.5	87	72.5
1.1 to 2	3	7.5	11	27.5	12	12	26	21.67
2.1 to 3	0	0	0	0	3	3	3	2.50
More than 3	3	7.5	1	2.5	0	0	4	3.33
Total	40	100	40	100	40	100	120	100

Table.7 Distribution of the respondent according to their housing pattern: N=120

House type	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Hut	10	25	0	0	0	0	10	8.33
Mud House	10	25	1	2.5	5	12.5	16	13.33
Mixed House	8	20	15	37.5	12	30	35	29.17
Brick House	12	30	19	47.5	20	50	51	42.5
Manson	0	0	5	12.5	3	7.5	8	6.67

Table.8 Distribution of the respondent according to their production: N=120

Range		Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
		No.	%	No.	%	No.	%	No.	%
AREA									
KHARIF	Up to 1.0	34	85	28	70	25	62.5	87	72.5
	1.1-2	3	7.5	11	27.5	12	30	26	21.67
	2.1-3	0	0	0	0	3	7.5	3	2.50
	>3	3	7.5	1	2.5	0	0	4	3.33
	PRODUCTION								
	Up to <30	36	90	22	55	21	52.5	79	65.83
	31-60	1	2.5	17	42.5	16	40	34	28.33
	61-90	1	2.5	0	0	3	7.5	4	3.33
	91>120	2	5	1	2.5	0	0	3	2.50
BORO	AREA								
	Up to 1.0	34	85	28	70	25	62.5	87	72.5
	1.1-2	3	7.5	11	27.5	12	30	26	21.67
	2.1-3	0	0	0	0	3	7.5	3	2.50
	>3	3	7.5	1	2.5	0	0	4	3.33
	PRODUCTION								
	Up to <30	29	72.5	18	45	15	37.5	62	51.67
	31-60	8	2	20	50	21	52.5	49	40.83
	61-90	1	2.5	1	2.5	3	7.5	5	4.17
	91>120	2	5	1	2.5	0	0	3	2.50

Table.9 Distribution of the respondent according to their occupation: N=120

Occupation	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Primary (Cultivation)	40	100	40	100	40	100	120	100
SECONDARY								
No occupation	19	47.5	12	30	13	32.5	44	36.67
Cultivation	0	0	0	0	0	0	0	0
Service	2	5	5	12.5	5	12.5	12	10.00
Business	10	25	11	27.5	11	27.5	32	26.67
Labour	9	22.5	12	30	11	27.5	32	26.67

Table.10 Distribution of the respondent according to their annual income: N=120

Income range	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Up to 50000	23	57.5	11	27.5	14	35	48	40
50001-100000	13	32.5	21	52.5	19	47.5	53	44.17
100001-150000	2	5	4	10	5	12.5	11	9.17
150001-200000	0	0	2	5	2	5	4	3.33
200001-250000	1	2.5	0	0	0	0	1	0.83
250001-300000	1	2.5	2	5	0	0	3	2.50
Above 300000	0	0	0	0	0	0	0	0
Total	40	100	40	100	40	100	120	100

Table.11 Distribution of the respondent according to possession status of agricultural implement: N=120

Index	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
Up to 10000	39	97.5	38	95	38	95	115	95.83
11000 to 20000	0	0	0	0	0	0	0	0
21000 to 30000	0	0	0	0	0	0	0	0
31000 to 40000	0	0	0	0	0	0	0	0
Above 40000	1	2.5	2	5	2	5	5	4.17

Table.12 Distribution of the respondent according to their cosmopoliteness: N=120

Index	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
0-25	20	50	10	25	4	10	34	28.33
26-50	13	35.5	26	65	30	75	69	57.50
51-75	6	15	3	7.5	4	10	13	10.83
76-100	1	2.5	1	2.5	2	5	4	3.33
Total	40	100	40	100	40	100	120	100

Table.13 Distribution of the respondent according to their media exposure: N=120

Index	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
0-25	11	27.5	0	0	2	5	13	10.83
26-50	16	40	12	30	13	32.5	41	34.17
51-75	12	30	16	40	16	40	44	36.67
76-100	1	2.5	12	30	9	22.5	22	18.33
Total	40	100	40	100	40	100	120	100

Table.14 Distribution of the respondent according to their social participation: N=120

`SPI Range	Sabang (n=40)		Pingla (n=40)		N. garh (n=40)		Total (n=120)	
	No.	%	No.	%	No.	%	No.	%
0-25	29	72.5	22	55	25	62.5	76	63.33
26-50	9	22.5	14	35	13	32.5	36	30.00
51-75	2	5	3	7.5	2	5	7	5.83
76-100	0	0	1	2.5	0	0	1	0.83
Total	40	100	40	100	40	100	120	100

The production of the three block in two different season of Kharif and Boro were found that majority of the respondents from Kharif season with (65.83%) less than 30 quintals, 31 to 60 quintal (28.33%) in second category, 61-90 quintal (3.33%) in third category and 91-120 quintal (2.50%) in fourth category. From Boro season majority of the respondent were found with (51.67%) less than 30 quintal, 31-60 quintal (40.83%) in second category, 61-90 quintal (4.17%) in third category and 91-120 quintal (2.50) in fourth category. Analysis of data from table 9 in occupation on primary and secondary indicated that all the respondents (100%) from the three blocks were having cultivation as their primary occupation.

From secondary occupation from the total blocks, indicate that majority of the respondents (36.67%) with no occupation in first category, business and labour (26.67%) each in second and third category and service (10%) in fourth category.

Analysis of data from table 10 in annual family income indicated that majority of respondent with Rs. 50001-100000 (44.17%) in first category, up to Rs. 50000 (40%) in second category, Rs. 100001- 150000 (9.17%) in third category, Rs. 150001-200000 (3.33%) in fourth category, Rs. 250001-300000 (2.5%) in fifth category and Rs. 200001-250000 (0.83%) in sixth category.

Analysis of data from table 11 in agricultural implements indicated that majority of respondent with up to 10000 (95.83%) in first category and above 40000 (4.17%) in second category.

Analysis of data on cosmopoliteness is been presented in four class intervals, from table 12 it indicated that majority of respondents with 26-50 index (57.50%) in first category, 0-25 index (28.33%) in second category, 51-75 index (10.83%) in third category and 76-100 index (3.33%) in fourth category.

Analysis of data from table 13 in media exposure indicated that majority of respondent with 51-75 index (36.67%) in first category, 26-50 index (34.17) in second category, 76-100 index (18.33%) in third category and 0-25 index (10.83%) in fourth category.

Analysis of data from table 14 in social participation indicated that majority of respondents with 0-25 index (63.33%) in first category, 26-50 index (30%) in second category, 51-75 index (5.83%) in third category and 76-100 index (0.83%) in fourth category.

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