

A Study on Adoption Behavior of Tribes about Agricultural Technologies and Practices in West Bengal

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ABSTRACT: Agriculture is the backbone of the Indian economy and the new and advancement of the technologies can enhance this sector more perishable and growth oriented. The technologies and practices innovated and transferred to the field for adoption. The level of adoption is not similar for different tribal like other farmers. Advancement and adaptable technologies lead to agricultural advancement. The level of agricultural technology adoption among different ethnic groups in two agro-climatic zones namely Red-laterite and Terai in West Bengal has been studied. Randomly selected 400 respondents, 100 from each four ethnic group Santhal, Sabar, Oraon and Toto were interviewed with a pretested structured interview schedule. Santhal is the most adopter of agricultural technologies followed by Toto among other ethnic groups under study. Availability of resources like land holding, material possession and accessibility or exposed to communication agents has significantly impacted the adoption process among the tribal farmers of West Bengal.

INTRODUCTION

In developing country like India, the technology transfer is very essential and the backbone of any economic upliftment. One side continuous development and introduction of new technologies or practices are important and the other side the acceptance and regularizing of practicing these technologies make the purpose fruitful. Adoption is the full use of the innovated technology, knowledge or new practices. The increasing rate of technological advancement in the agricultural sector has increased

the rate of efficiency and productivity (Ugochukwu, 2018).

The Scheduled Tribe in India shares 8.6 % of India's total population (Census, 2011) and 70.5% of the ST population is directly involved in the agricultural sector (NSS 66th Round, 2009-10). The adoption of agricultural technologies and related practices is associated with farmer's well-being and has the role of 'directly' contributing to poverty alleviation (Mendola, 2007). As per Census 2011, total tribal population in West Bengal is 52,96,963 which is about 5.8% of the total population of the state. About 48,55,115 (91.65 %) persons of the tribal population lived in rural areas and most of them are Santhal

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(48.65%) followed by Oraon (12.35%). In West Bengal only 07.05% tribals are directly involved in cultivation either in main or marginal source of income and 42.26 % involved as agricultural labour. This tribal population has composed of 40 ethnic groups out of them 3 are PVTGs (Particularly Vulnerable Tribal Groups) i.e. Birhor, Lodha and Toto.

Tribal ethnic groups are socio-economically different and that differences reflect in their lifestyle, livelihood, habitat and behavioral pattern (Pal *et al.*, 2015). The present study has tried to find out the adoption behavior of different tribal sub-caste (ethnic groups) and the relation of adoption of agricultural technologies and practices with the socio-economic status.

MATERIALS & METHODS

The study was conducted in two thickly tribal populated agro-climatic zones in the West Bengal state of India. Purulia district from the Red-laterite zone and Alipurduar district from the Terai zone were selected purposively for the study. From each district, one populated ethnic group and one ethnic group of special characteristics were considered as study population. Santhal and Sabar from Purulia district, and Oraon and Toto from Alipurduar districts were considered for the study. Santhal and Oraon are the most populated ethnic groups whereas ethnic group Sabar was selected due to their special characteristic that is confined habitation and less exposure to the general population. Toto was as one particularly vulnerable tribal group. In Purulia Kashipur and Manbazar-I block and in Alipurduar district Kalchini blocks were selected randomly for the study. In addition to that only Toto ethnic group habitation Totopara under Madarihat-Birpara block was selected purposively to study the Toto ethnic group. The villages with more than 50% ethnic group population were considered for the study and the data were collected randomly from the list of tribal household by the researchers. Respondents aged 18 years and above were interviewed with the help of pre-tested interview schedule to collect data. Non-ethnic individual, below 18 years, non-resident and unwilling individuals were excluded from the collection of data.

Different socio-economic variables along with variables indicating technology adoption were considered for analysis. The adoption index was developed. The adoption score, according to this index, is derived for each farmer by adding the number of years he has used each of the applicable practices. The figure so obtained is then divided by the number of practices applicable to his farm. The adoption index was used for correlation analysis with the different socio-economic variables.

RESULTS

Primary field data in Table 1 describes that only Santhal (13 %) adopted SRI (system of rice intensification) method of cultivation among the other ethnic groups under study. 17% Santhal and only 1% Toto adopted integrated pest management (IPM) methods. Only 6% Santhal and 1% Toto adopted integrated nutrient management (INM) methods. Sabar and Oraon respondents were not at all practicing SRI method of cultivation as well as IPM and INM. Application of vermicompost was adopted by 18 % Santhal, 3 % Sabar and 7 % Toto. The highest adopters of organic farming were Toto (39 %) followed by Santhal (35%), Oraon (27%) and Sabar (11%). HYV seeds were adopted by 34 % Santhal, 23% Oraon, 11% Toto and 6 % Sabar adopted HYV seeds as a part of their agricultural practice. The adoption level of chemical fertilizer was highest in Santhal (40 %) followed by Oraon (23%), Toto (9%) and Sabar (7%). Power tiller was adopted by 22 % Santhal and only 1 % Toto respondent. The shallow pump was also adopted by 21 percent Santhal followed by Toto (4 %) and Sabar (1%). No Oraon respondents adopted power tiller and shallow pump. Application of insecticides were adopted by 40 % Santhal followed by Oraon (23 %), Toto (11%) and Sabar (6%). Rearing of improved animal breeds was adopted by 18 % Santhal followed by Oraon (15%), Sabar (8%) and Toto (4%). Only 6 % Santhal and 1 % Sabar adopted artificial animal breeding. 23 % Toto, 19 % Oraon, 15 percent Santhal and 6% Sabar respondents vaccinated their animals. Only 8 % Santhal, 6% Toto, 3 % Oraon and 1 % Sabar adopted post-harvest management practices.

TABLE 1

Percentage of modern technology and practices adopted by different Tribal sub-caste under study

Adoption category	Santhal	Sabar	Oraon	Toto
SRI (System of Rice Intensification) Method	13	%	%	%
IPM (Integrated Pest Management)	17	%	%	1
INM (Integrated Nutrient Management)	6	%	%	1
Vermicompost	18	3	%	7
Organic Farming	35	11	27	39
HYV seed	34	6	23	11
Chemical fertilizer	40	7	23	9
Power tiller	22	%	0	1
Shallow pump	21	1	0	4
Insecticides	40	6	23	11
Improve breeds of animals	18	8	15	4
Artificial Breeding	6	1	0	%
Livestock vaccination	15	6	19	23
Post harvest Management	8	1	3	6

Source: Fieldwork

The correlation among the socio-economic variables with the adoption of agricultural technologies of different ethnic groups under study was also analysed to define the interrelationship among the variables. Age was highly positively significantly correlated with adoption in Santhal respondents. Gender was positively significantly correlated with adoption for Oraon respondents. Among all respondents, category and family income were highly positively and significantly correlated with the adoption of agricultural technologies. Source of income was highly negatively and significantly correlated with adoption in the case of Sabar and Toto respondents whereas among Santhal respondents it was positively significantly correlated. All the ethnic groups under study except Oraon respondents, the occupation were highly positively significantly correlated with adoption. Family size was highly negatively significantly correlated and negatively significantly correlated with adoption among Oraon

and Toto respectively. House type was highly positively significantly correlated with adoption in case of Santhal, Oraon and Toto, and only for Sabar was positively significantly correlated with adoption. In all respondents, the landholding was highly positively significantly correlated with adoption. Among Santhal and Toto, material possession was highly positively significantly correlated whereas it was positively significantly correlated and negatively significantly correlated with adoption among Sabar and Oraon respectively. Urban contact and mass media were positively significantly correlated and were highly positively significantly correlated with adoption for Sabar and Toto respectively but for Oraon urban contact was highly negatively significantly correlated and mass media was highly positively significantly correlated with adoption. Among Oraon and Toto per cosmopolite was positively significantly and highly positively significantly correlated with adoption respectively.

TABLE 2

Correlation of Socio-economic variables with Agricultural technology adoption among Ethnic groups under study

Variable	Santhal	Sabar	Oraon	Toto
Age	.308**	-.183	-.042	.125
Religion	.125	.164	-.067	-.061
Gender	-.191	-.134	.236*	-.134
Marital	-.027	-.092	.014	-.047
Category	.594**	.396**	.796**	.426**
Family-income	.740**	.514**	.401**	.402**
Occupation	.343**	.387**	.074	.372**
Education	-.098	.191	-.038	.145
Family type	.003	-.042	-.166	-.094
Family size	-.013	-.076	-.407**	-.252*
House type	.326**	.242*	.342**	.349**

Land holding	.641**	.728**	.788**	.724**
Material possession	.634**	.221*	-.202*	.700**
Urban con	-.184	.206*	-.342**	.340**
Mass media	-.047	.202*	.258**	.563**
Personnel cosmopolite	.064	.168	.208*	.561**
Personnel localite	-.166	.062	.195	-.037

**indicate 1 % level of significant

* indicate 5 % level of significant

Source: Fieldwork

DISCUSSION

Most of the agricultural technologies were adopted by Santhal and Toto only but Santhal were good adopters of different modern agricultural technologies among all other ethnic groups under study. Awais and Khan (2014) observed that land holding one of the major constraints of adaption of technology among the ethnic groups. But technology related to animal husbandry was very low in adoption among them. Sabar was the least adoptive of most of the agricultural technologies may be due to their traditional farming nature or limitation of access to the technologies.

Old aged Santhal respondents were significantly more adopters of agricultural technologies and they used the same for a long time. Agricultural practices introduced to Santhal before other ethnic groups and they adopted the same prior to others so the old aged Santhal respondents were significantly high adoption scores. Parida (2015) found that different agricultural technology is well spread among Santhal. Voh (1982) reported that the higher the socio-economic status, the higher the tendency to adopt the innovation proneness. Innovation proneness was better in Santal, whose family members can only read and write. Family income, landholding, material possession had a significant relation with more technology adoption in all ethnic groups, it clearly stated that there is a relation of resources available with the adoption of agricultural technologies. Santals who were habituated with the use of mass media sources, personal cosmopolite sources, and personal localite sources had a positive response towards innovation proneness. Dutta *et al.* (2014) found positive and significant impact of communication on adoption of technology among tribal women. Poor knowledge of technologies due to indifferent communication leads to the non-adoption of agricultural technologies (Sharma and Khan, 1997). The active presence of extension agents had also

significantly impacted the technology adoption process (Rudolph and Dunstan, 1991).

CONCLUSION

All the respondents of the study belong to ethnic groups but their adoption level of different agricultural technologies is not at all similar in nature. Santhals are quite high in population and their habitation spread nearly all over the districts of West Bengal. Whereas Toto is a primitive vulnerable tribal group lived in one specified area namely Totopara in West Bengal. Considering other two ethnic groups i.e. Oraon and Sabar, these groups are (Santhal and Toto) more adopters of agricultural technologies. Availability of resources, landholding has significantly related with the adoption of agricultural technologies. Communication is another factor that significantly impacts the adoption process. Ethnic groups that had available resources, exposed to different communication agents have a high level of agricultural technology adoption. It seems that not only availability of technology determines the adoption process but the need of the farmers, available resources to access the technology or practices and exposure to different communicators like extension agents, etc. also play a crucial role in the adoption of innovation processes among the Tribal farmers of West Bengal.

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