

Adoption Level of Farmers Practicing Organic Farming in Birbhum District of West Bengal

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ABSTRACT

Organic farming follows the principle of circular causation and has emerged as a response to health, environmental, and sustainability issues. The study was conducted in 2018 to determine the level of adoption of organic farmers in the Birbhum district of West Bengal. The results of the study found that the majority of respondents were below the medium level of adoption. Among the ten independent variables, eight variables had a positive and highly significant relationship to dependent variables. Regression analysis showed that all of the 10 independent variables combined had a significant change in achievement motivation to the extent of R^2 39.8 percent, and of the 10 variables, only three variables had a positive effect at one percent level of confidence. Path analysis shows that the independent variable affected (direct and indirect effect) on the level of acceptance of organic farmers. Sustainable organic farming has an important role to play in increasing the profits of organic farming in the study area.

Keywords: Adoption Level; Organic Farming; Vegetable Growers; Sustainable Agriculture; Path Analysis;

Organic farming follows the circular causation theory and has arisen in response to concerns about health, climate, and sustainability. It assesses the status, opportunities, and potential for sequestration in India. It identifies constraints that hinder the adoption of, in particular, for smallholder farmers who make up more than 70 per cent of the agricultural community in India. With a large area of land and climate diversity, India has a considerable potential to contribute to C-sequestration. Organic soil carbon (SOC) in cultivated soils is less than 5 mg g⁻¹ compared to 15-20 mg g⁻¹ in uncultivated soils. This available potential of 10-15 mg g⁻¹ soil – C sink could balance net fossil fuel emissions. While India ranks second in the certified number of organic farms (44,926), it ranks 13th in an area in which only 0.3 per cent of the total agricultural land is covered. Compared to many other countries, the scenario appears bad. Farmer's apprehension about India is rooted in the lack of sufficient organic nutrients, bio-fertilizers, and

local market for organic products, and limited access to guidelines, certification, and input costs. Capital-driven control by contracting firms further discourages smallholder farmers. Government and non-governmental organizations need a coordinated initiative to enable farmers to tackle climate change and health as a solution.

This field is the hardest and time-consuming, and so this kind of work only takes place in a few areas. A recent survey of productivity, land health, and economy of selected organic farms carried out is an interesting piece of work (Ramesh *et al.* 2010). A single organic system for low-precipitation areas has been developed at the Central Arid Zone Research Institute in Jodhpur to establish a high-value, low-water organic development protocol (Sharma, 2011). Adoption and extent of organic vegetable cultivation using the Logistic Regression model (Thapa, *et al.* 2011). Organic agriculture is ensure environmental sustainability. Such activities are generally very harmless to human health,

as they maintain soil fertility and preserve ecosystems. It relies on natural biodiversity and enhanced ecological processes or cycles locally adapted, rather than genetically engineered resources and the use of synthetic inputs (Auerbach, 2013). Factors affecting the farmers' use of the association to follow organic farming (Prashanth, et. al. 2014). Improving soil fertility by increased use of fertilizers and plant protection chemicals, as well as using modern agricultural machinery for tilling, irrigation, sowing, and crop harvesting, may achieve the most remarkable economic advantages at the farm level and thus provide the food production required for the rapidly increasing human population (Panda, 2017). The excessive use of synthetic chemicals, which significantly contaminate the ecosystem, as well as the mechanical soil disturbance and irrigation has contributed to the generation of resistant insects, fungi, weeds, etc., the accumulation of chemicals in crops and soil, water, and air pollution and, subsequently, to some degree contribute to the greenhouse effect and global warming (Yue et. al. 2017). To set limits to this production process, the European Commission has introduced a quota regulation scheme with a guaranteed price for restricted milk and sugar beet production per farm (Birt, 2016). Keeping this in mind, the present study was undertaken to assess the adoption level of farmers practicing organic farming and to find out the relationship between adoption levels of organic farmers with the profile of organic farmers.

METHODOLOGY

The present study was confined to the ex-post-facto research design, as the independent variable in the field of study is already operational. Based on the purposeful sampling process, the research was conducted in West Bengal state during 2018. The purposeful sampling procedure was followed for the selection of districts, blocks, and villages. Four villages, namely Bahadurpur, Raipur, Binuria, Ballabhpur, and Lohagarh, were selected from the Sriniketan block. The selected block was randomly selected from the village, and 22 farm respondents from five villages were randomly selected. The sample size was also 110. Selecting and estimating the variables for presenting the study is based on study priorities and suggestions received from experts in literature and field. The data was collected using the standardized method to make

the findings valid and comprehensible; the data were coded, tabulated, analyzed, and presented in the table. The data analysis results have been interpreted with precision and concluding. For example, frequency, percentage, arithmetical mean, standard deviation, correlation and path analysis, statistical methods, and techniques are used with the help of the SPSS software and the OPSTATE website.

RESULTS AND DISCUSSION

The adoption of organic farming : Adoption is the most important factor in practicing organic farming. The variable was measured by a simple percentage method.

Table 1. Distribution of the respondent according to Adoption of organic farming practicing (N = 110)

Category	No.	%
Low (< 3)	0	0
Medium (3 To 5)	98	89
High (> 5)	12	11
Std. deviation = 4.1823		Mean = 1.042

As evident from Table no. 1 majority (89%) of the respondents had a medium level of adoption, 11.00 percent of the respondents scored the high level of adoption and among the respondents, no one comes under the low level of adoption. The mean score of the total distribution is 1.042 and the standard deviation of the distribution is 4.182.

Table 2. Distribution of the respondent according to their Adoption level of farmers practicing organic farming

Characteristics	SD	Mean
Age	50.85	8.58
Education	1.18	0.78
Farming experience	28.25	9.02
Extension participation	0.97	1.04
Annual income	68900.00	40568.65
Mass media exposure	1.72	0.81
Economic motivation	18.38	2.25
Cosmo politeness	1.26	0.73
Information Consulted	4.18	1.04
Socioeconomic status	13.03	2.59

Descriptive analysis of the adoption level of farmers practicing organic farming : Descriptive statistics are brief descriptive coefficients that summarize a given data collection that can either represent the entire population or be a subset of a population. Descriptive statistics are broken down into core measures of tendency and variability (spread). Measures of the

central trend include mean, while measures of variance include standard deviation, Table 2 illustrated that the descriptive statistical analysis as a mean and standard deviation of the ten variables of adoption level of farmers practicing organic farming within the study area.

Correlation between an independent variable with the adoption level of farmers practicing organic farming : The relation between the adoption level of organic farmers with independent variables was statistically analyzed and presented in Table 3. Age, Education, Farming Experience, Extension participation, Mass Media Exposure, Cosmo politeness, Information Consulted, and all over socioeconomic status were significantly and positively correlated with the adoption level at one percent level of confidence.

Table 3. Correlation between an independent variable with the adoption level of farmers practicing organic farming

Independent variables	Correlation	ρ - value
Age	-0.333**	0.000
Education	0.512**	0.000
Farming Experience	-0.409**	0.000
Extension participation	0.501**	0.000
Annual income	-0.103	0.284
Mass media exposure	0.340**	0.000
Economic motivation	0.150	0.117
Cosmo politeness	0.302**	0.001
Information Consulted	0.259**	0.006
Overall Socio economic status	0.340**	0.000

**Correlation is significant at the 0.01 level (2tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Multiple regression analysis between an independent variable with the adoption level of farmers practicing organic farming : When we applied regression analysis, only one of them demonstrated their functional relationship to the level of acceptance of organic farmers and found it significant (Table 4). The multiple regression analysis of the relationship between the socio-economic characteristics of organic farming practiced by farmers and the level of acceptance of organic farmers is presented and discussed under this heading. Age(X_1), Education (X_2), Farming experience (X_3), Extension participation (X_4), Annul income (X_5), Mass media exposure (X_6), Economic motivation (X_7), Cosmo politeness (X_8), Information Consulted (X_9), Socioeconomic status (X_{10}) were taken as independent variable whereas adoption level of farmers practicing organic farming is a dependent variable. In the

Regression study, all 10 independent variables were compiled to demonstrate the impact and substantial variance of these independent variables over the level of adoption of farmers practicing organic farming to the extent of R^2 -39.8%, and out of ten variables only education, extension participation, and overall socioeconomic status had a positive significant relationship at one percent level of confidence.

Table 4. Regression analysis between an independent variable with Adoption of organic farming

Characteristics	β -value	t- value	ρ – value
Age	0.058	1.107	0.271
Education	1.061**	2.785	0.006
Farming Experience	-0.020	-0.391	0.697
Extension participation	0.811**	3.025	0.003
Annual income	0.000	-0.495	0.622
Mass media exposure	0.022	0.062	0.951
Economic motivation	0.050	0.534	0.594
Cosmo politeness	0.189	0.515	0.608
Information Consulted	-0.217	-0.889	0.376
Overall SE status	0.244**	3.072	0.003

Path analysis of the adoption level of farmers practicing organic farming with independent variables : Path analyzes are techniques that seek to evaluate the direct and indirect effects between the number of variables and thus help to quantitatively understand the interrelationships within an established or assumed casual system that occur in certain particular populations (Kalantari,2003). To this end, the researcher seeks to provide a situation in which a model of analysis combines convergence-based theories with their common points in constructing the theoretical structure method.

Table 5 showed the direct and indirect effects between the interrelated independent variables, with the degree of adoption of organic farmers. The overall cumulative indirect impact on the level of adoption of farmers practicing organic farming was shown by first position by age (0.533) variable followed by farming experience (0.351) in the second position and information consulted (-0.336) was obtained in the third position. The largest total direct impact on the achievement motivation of organic farmers had been shown by the variable extension participation (0.339) as the first position followed by Education's second position (0.335) and the third position was reached by the overall socio-economic status (0.255). The maximum total impact on

the achievement motivation of organic farmers showed variable education (0.513) as the first position followed by extension participation (0.501) and the third position was acquired by farming experience (-0.409).

Table 5. Path analysis of Adoption of organic farming

Characteristics	Total indirect effect	Total direct effect	Total effect
Age	-0.533 ^I	0.2	-0.333
Education	0.178	0.335 ^{II}	0.513 ^I
Farming Experience	-0.336 ^{III}	-0.073	-0.409 ^{III}
Extension participation	0.162	0.339 ^I	0.501 ^{2nd}
Annual income	-0.061	-0.043	-0.104
Mass media exposure	0.332	0.007	0.339
Economic motivation	0.105	0.046	0.151
Cosmo politeness	0.246	0.055	0.301
Information consulted	0.351 ^{II}	-0.091	0.260
Overall SE status	0.085	0.255 ^{III}	0.340

CONCLUSION

The study concluded that most of the respondents fell under the medium level of adoption in the study area of farmers who practice organic farming. Eight variables Age, Employment, Farming Experience, Mass Media Exposure Extension lack of participation, Cosmo

politeness, Knowledge Consulted, and Overall Socio-Economic Status were significantly and positively correlated with the adoption of farmers practicing organic farming among ten independent variables. In the Regression study, all 10 independent variables were compiled to demonstrate the influence and significant variability in the adoption of organic farmers to the extent of R² 39.8 percent and Of the ten variables, only three variables Education, extension participation and overall socioeconomic status were positive at a one percent confidence level. Analysis of the path showed that independent variables affected (direct and indirect effect) on the adoption of farmers practicing organic farming where the highest total indirect effect on the dependent variable was seen as the Age (-0.533) variable of first place. The maximum total direct effect on the dependent variable was exhibited as the first position achieved by the Extension participation (0.339) variable and the maximum total effect on the dependent variable was shown by achieving the first position by the Education (0.513) variables. This research will be extremely useful to policymakers to encourage organic farming, from subsistence level to intensive level, to increase organic farming income in the study area.

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