

# A study on adoption behaviour of tribal farmers in respect to Organic cotton production technology of Lanjigarh block of Kalahandi district in Odisha

Amrita Mishra<sup>1\*</sup>, Dr. Tushar Kanti Das<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Business Administration  
Sambalpur University

<sup>2</sup>Associate Professor, Department of Business Administration  
Sambalpur University

## Abstract

Organic cotton production is about replacing synthetic fertilizers and pesticides with organic fertilizers and pesticides. India is the second largest country in the world in cotton production. Odisha is in 10<sup>th</sup> position in cotton production in India. Kalahandi district is one of the major cotton growing districts in Odisha. There is an increasing demand in both national and international markets for organic cotton. Traders from different part of India procure cotton from Kalahandi. Cotton is grown primarily in Bhawanipatna, Narla, Karlamunda and Lanjigarh blocks of Kalahandi district. Most of the farmers in Lanjigarh block of Kalahandi district are tribal. Lanjigarh block is also come under tribal sub-plan areas. Adoption of organic cotton production technology is helping in the promotion of the second goal of Sustainable Development Goals (SDGs). For the society and environment the adoption of organic technologies is working as blessings. The main aim is to study the adoption behaviour of tribal farmers in respect to Organic cotton production technology and the issues related to this in Lanjigarh block of Kalahandi district in Odisha. Percentage analysis was done to present the findings. Chi-square analysis was used to test the hypotheses. Among all the attributes education, land holding, farm power, material possession, social participation, and knowledge level were found to be associated with the adoption behaviour while age, family type, family size and occupation were not associated with adoption behaviour of organic cotton production technology.

**Keywords:** Organic, Organic cotton, Adoption behaviour, Tribal farmer, Sustainable.

## 1. Introduction

Organic cotton production is about replacing synthetic fertilizers and pesticides with organic fertilizers and pesticides. Organic cultivation methods are not only based on input based conventional production but also with the knowledge of agronomic processes. The systematic approach aims to establish a diverse and balanced farming ecosystem which ideally includes all types of crops and farm activities. Farms needs to complete a two years conversion period to change their production system from conventional to organic. An essential element of organic production is careful selection of varieties adapted to local conditions in terms of climate, soil and robustness to pests and diseases.

Soil fertility management and crop nutrition are based on crop diversification and organic inputs such as compost, mulch and manures. Pest management measures focus essentially on pest prevention and stimulation of a balanced agro ecosystem through crop rotation, mixed cultivation, trap crops, and the use of natural pesticides when pest infestation rises above the economic threshold. (Organic cotton- Agronomic practice)

India is the second largest country in the world in cotton production. Odisha is in 10<sup>th</sup> position in cotton production in India. (MapsOfIndia.com, 2014-15). Kalahandi district is one of the major cotton growing districts in Odisha. There is an increasing demand in both national and international markets for organic cotton. Traders from different part of India procure cotton from Kalahandi. Cotton

is grown primarily in Bhawanipatna, Narla, Karlamunda and Lanjigarh blocks of Kalahandi district. In 20015-16, there was a target to cover 50,000 ha of land under cotton cultivation and the achievement was 46,152 ha. In 2016-17 kharif seasons, as against target of 55000 ha, the achievement was 53001 ha. The farmers are getting technical support from the agriculture department and different non Govt. Organizations. (Indian Express, 2017).

## 2. Objective of the study-

1. To Know the profile of Tribal Organic Cotton Growers.
2. To know the extent of knowledge and adoption of improved production technology among the tribal organic cotton growers.
3. To analyse the association between the dependent variable (Adoption of cotton technology) with independent variables. (Personal, socio economic, extension participation, and Knowledge level etc).

## 3. Significance of the study:

The findings of the study are being expected to provide valuable information to the administrators, extension workers for communicating information to the farmers. The proposed study will help to understand the recommended package of practices for the tribal farmers in the state and propose a guideline' for the field extension workers. The present investigation may also held to formulate strategies for minimizing gap of productivity of cotton crop

among the tribal farmer in general and farmers of Lanjigarh block of kalahandi district in particular.

#### 4. Review of literature-

**Awareness of organic farming among the farmers in India-** Suresh Patidar and Himanshu Patidar (2015) they both have worked with this objective in selected villages of West Nimar region of M.P. They have used a multi-stage convenient sampling technique and took 100 respondents for their study. They have used exploratory research design for their study. Their study mainly based on the quantitative research but a part of it is also based on qualitative research. To analyse their data they have used different statistical techniques like data validity test, reliability test, frequency distribution, factor analysis etc. They have analysed their data with IBM SPSS 17.0 software package and Microsoft Excel. From their study they found that the farmers have high adoption rate of innovations related to organic farming and other agricultural policies. The gap between knowledge and practice can be bridged by better understanding of the system and by getting provision of credit facilities, training on technicalities etc. Cost associated with organic farming doesn't affect farmer's attitude.

#### Consumer awareness and interest on buying organic food.

Justin Paul(2012), Giuseppe Pellegrini(2009), Shih-Jui Tung, Chun Shih, Sherrie Wei, Yu-Hua Chen (2012), Abdullah Al-Swidi, Sheikh Mohammed Rafiul Huque (2014), Christian A. Klo Ckner, Silvia Ohms (2009), Somnath Chakrabarti (2010), Sushil Kumar, Javed Ali (2011), Joris Aertsens, Koen Mondelaers, Wi Verbeke(2009), Carolyn Dimitri, Rachael L. Dettmann (2012), they have collected primary data for their survey and used different statistical techniques like multiple regression analysis, factor analysis, t-test, ANOVA, Chi-Square test etc. For data analysis most of them have used SPSS software packages. From their study they have found various factors which affect the buying decision of a consumer that are health, education, life style, income, demographic factors etc. The satisfaction level of consumers varies due all these factors. Some consumers are highly concern about pesticides but low trust in organic farming, this shows an attitudinal inconsistency towards organic food. Authors also found some factors that influence the buying behaviour of organic food in India that are organic food-specific consumer innovativeness, organic food specific consumer opinion leadership, word of mouth and affective commitment about store. By analysing the factors affecting awareness level of consumers on OF, the researchers also found that the untapped potential markets for organic food in the countries like India needs to be realised with organised interventions, which require a better understanding of the consumers' preference on food.

#### Organic cotton-

Dionys Forster, Christian Andres, Rajeev Verma, Christine Zundel, Monika M. Messmer, Paul Mäder (2013), they have suggest that organic soybean production is a viable option for smallholder farmers under the prevailing semi-arid conditions in India. Future research needs to elucidate the long-term productivity and profitability, particularly of cotton and wheat, and the ecological impact of the different farming systems. Their study presents agronomic and economic data from the conversion phase (2007–2010) of a farming systems comparison trial on a Vertisol soil in Madhya Pradesh, central India. A cotton-soybean-wheat crop rotation under biodynamic, organic and conventional (with and without Bt cotton) management was investigated. We observed a significant yield gap between organic and conventional farming systems in the 1<sup>st</sup> crop cycle (cycle 1: 2007–2008) for cotton (-29%) and wheat (-27%), whereas in the 2<sup>nd</sup> crop cycle (cycle 2: 2009–2010) cotton and wheat yields were similar in all farming systems due to lower yields in the conventional systems. In contrast, organic soybean (a nitrogen fixing leguminous plant) yields were marginally lower than conventional yields (-1% in cycle 1, -11% in cycle 2).

#### Benefit of Organic Farming-

P.Ramesh, N.R. Parwan, A.B. Singh, S.Ramana, Shushil Kumar Yadav, Rahul Srivasthava and A.Subba Rao (2010) they have collected primary data from 50-certified organic farm and 50-conventional farm of Kerla, Maharastra, Tamilnadu for their study. From their study they have found that the productivity of crops in organic farming is lower as compared to conventional farming. It is economically feasible to practise organic farming when the farmers are able to get premium price for their produce and with the reduce cost of cultivation by not depending upon the purchased off-farm inputs. There was a reduction in the average cost of cultivation in organic farming as compared to conventional farming. Organic carbon of soil in organic farms are more as compared to conventional farms. Microbial biomass carbon were higher in organic soil. Verena Seufert, Navin Ramankutty and Jonathan A.Fole (2012), Christine Hoefkens, Isabelle Vandekinderen, Kathleen Baert, John Van Camp(2009), they have also worked with the previous objective. They have collected secondary data from different articles and used Meta Win 2.0 and SPSS version 15.0 for their data analysis. Chi-square test was also used by the authors to compare the frequencies in which pesticide residues occurred between both farming system. In their respective studies they have found that the overall organic yields are lower than conventional farm. The performance of organic systems varies substantially across crop types and species. For example, yields of organic fruits and oilseeds crops shown a small, but not statistically significant, difference to conventional crops, whereas organic cereals and vegetables have significantly lower yields than conventional crops.

#### 5. Research Methodology-

**Study Area-**The study was conducted in Lanjigarh block of Kala-handi District. The study was conducted in 10 villages of Lanjigarh block i.e. Luma, Hatisaal, Kumarpada, Dangajorh, Ambaguda, Balisara, Bhataguda, Ghatikundru, Gopinathpur and Madnguda.

**Sampling Procedure-** A multi-stage convenient sampling was used for this study. 100 respondents were selected from the 10 villages of Lanjigarh block.

**Research type-**The type of research design followed for the study will be exploratory research design.

**Data collection-** This research is mainly based on quantitative pattern; hence the data was obtained by means of structured questionnaires. The data will be collected from farmers by doing field visit.

**Data analysis tools-** Percentage analysis and Chi-square test has been performed to get the findings. With the help of Microsoft Excel all the data has been analysed.

#### Hypothesis

On the basis of objectives and different variables, the following null hypothesis were formulated and tested for significance."

1. There is no significant association between the age of growers and their adoption of behaviour of the organic cotton production technology.
2. There is no significant association between the education of the growers and their adoption of behaviour of the organic cotton production technology.

3. There is no significant association between the family size of growers and their adoption of behaviour of the organic cotton production technology.
4. There is no significant association between the family type of growers and their adoption of behaviour of the organic cotton production technology.
5. There is no significant association between the land holding of growers and their adoption of behaviour of the organic cotton production technology.
6. There is no significant association between the material possession of growers and their adoption of behaviour of the organic cotton production technology.
7. There is no significant association between the farm power of growers and their adoption of behaviour of the organic cotton production technology.
8. There is no significant association between the Knowledge of growers and their adoption of behaviour of the organic cotton production technology.
9. There is no significant association between the occupation of growers and their adoption of behaviour of the organic cotton production technology.
10. There is no significant association between the social participation of growers and their adoption of behaviour of the organic cotton production technology.

**Data Analysis-**

1. To Know the profile of Tribal Cotton Growers-  
The profile of organic cotton farmers mainly, age, education, family type, family size, land holding farm power, occupation, material possession have been studied and the findings are discussed below. The results of the present study revealed that most of the male (63%) tribal farmers are doing organic cotton. Most of the tribal farmers (45%) belonged to middle age group (36-50 yrs). As regard the education, the farmers were found to have attained up to primary schooling (35%). This might be due to adequate education facilities available in their villages. Majority (58.00%) of the farmers belonged to nuclear family. The study inferred that majority (40.00%) were having medium and small size of family. The investigation indicated that farmers (55%) possessed medium size of land holdings. The higher percentage of respondents (41.11%) indicated cultivation as their main occupation for the livelihood. The higher percentage of respondents (54.44%) indicated low material possession on account of low income of the selected respondents.
2. To know the extent of knowledge and adoption of improved production technology among the tribal cotton growers.

**Adoption behaviour**

1.	Land preparation	36	40.00
2.	Proper dose of fertilizer application	64	71.11
3.	Improved varieties	72	80.00
4.	Recommendation seed rate	12	13.33
5.	Seed treatment	44	48.88
6.	Timely sowing	85	94.44
7.	Method of sowing	70	77.77
8.	Row to row spacing	10	11.11
9.	Depth of sowing	13	14.44
10.	Irrigation	75	83.33
11.	Irrigation interval	37	41.11
12.	Weed control measures	40	44.44
13.	Insect control measures	60	66.66
14.	Disease control measures	30	33.33
15.	Harvesting management	42	46.66
16.	Storage management	21	23.33

The 1<sup>st</sup> column shows the organic cotton practices, the 2<sup>nd</sup> column shows the frequency and the 3<sup>rd</sup> column shows the percentage. This table indicate different practices along with number and percentage of respondents following them. The highest adoption (94.44%) was found to be of timely sowing followed by irrigation (83.33%), improved varieties (80.00%), method of sowing (77.77%), proper dose of fertilizer application (71.11%), insect control measures (66.66%), weed control measures (44.44%) disease control measures (33.33%), storage management (23.33%), depth of sowing (14.44%) recommended seed rate (13.33%), and row to row spacing (11.11%).

	Categories	No. of Respondents	Percentage
1	Low adopter		47.00
2	Medium adopter		33.00
3	High adopter		20.00

This data shows that out of the total, 47.00 per cent low adopter, 33.00 medium and 20.00 per cent high adopter of organic cotton technology. Thus, it may be inferred from the data that the higher percentage of organic cotton growers had low adopter of soybean production technology.

- To analyse the association between the dependent variable (Adoption of cotton technology) with independent variables. (Personal, socio economic, extension participation, and Knowledge level etc).-

Sl.N	Variables	No. of cases	Chi-square value
1	Age	100	7.87
2	Education	100	7.09
3	Land-holding	100	6.01
4	Family Type	100	4.30
5	Family Size	100	7.14
6	Occupation	100	2.39
7	Farm-power	100	5.11
8	Material Possession	100	10.76
9	Social Participation	100	7.85
10	Knowledge	100	21.16

**Hypothesis Result**

1. There is no significance association between the age of the growers and their adoption behaviour of the organic

cotton production technology. There is significant association between the education of the growers and their adoption of behaviour of the organic cotton production technology. There is no significant association between the family size of growers and their adoption of behaviour of the organic cotton production technology. There is no significant association between the family type of growers and their adoption of behaviour of the organic cotton production technology. There is significant association between the land holding of growers and their adoption of behaviour of the organic cotton production technology. There is significant association between the material possession of growers and their adoption of behaviour of the organic cotton production technology. There is significant association between the farm power of growers and their adoption of behaviour of the organic cotton production technology. There is no significant association between the occupation of growers and their adoption of behaviour of the organic cotton production technology. There is significant association between the social participation of growers and their adoption of behaviour of the organic cotton production technology.

## 6. Findings

1. The results of the present study revealed that most of the male tribal farmers are doing organic cotton. Most of the tribal farmers belonged to middle age group. As regard the education, the farmers were found to have attained up to primary schooling. This might be due to adequate education facilities available in their villages. Majority of the farmers belonged to nuclear family. The study inferred that majority were having medium and small size of family. The investigation indicated that farmers possessed medium size of land holdings. The higher percentage of respondents indicated cultivation as their main occupation for the livelihood. The higher percentage of respondents indicated low material possession on account of low income of the selected respondents.
2. Regarding the level of adoption of organic cotton production technology, it was found that majority of the respondent were in a low to medium level of adoption group.
3. Among all the attributes education, land holding, farm power, material possession, social participation, and knowledge level were found to be associated with the adoption behaviour while age, family type, family size and occupation were not associated with adoption behaviour of organic cotton production technology.

## 7. Conclusion

Organic cotton has provided significant price premiums for growers willing to meet the many challenges inherent in its production without the aid of conventional pesticides and commercial fertilizers. N.G.O like Chetana is giving training on organic cotton production technology. For the sustainability of agriculture the organic techniques are coming forward as blessings. In this study most of the respondents are in low to medium level of adoption group. So a lot of work needs to be done in the promotion and training on organic cotton production technology.

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