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Willingness to Adopt the Recommended Practices of Organic Turmeric among Kandhamal Farmers of Odisha

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Turmeric Cultivation is one of livelihood for the Kondh tribes of Kandhamal District of Odisha. These farmers were cultivating this crop with their traditional knowledge of crop practices without any intervention of chemical inputs. From the studies, it is found that farmers of the district were economically and educationally backward. Turmeric of Kandhamal is well known for its healing property, color, aroma etc. and received GI tag for its unique features. From the secondary data it was found that there were few public and private extension actors trying to promote organic recommended package of practices for Turmeric. And, to boost willingness among farmers towards recommended organic Turmeric various socio-economic variables might be responsible. In this view the present study was carried out (2020-21) in Kandhamal district of Odisha to understand attitude towards recommended organic Turmeric and socio-economic variables effecting willingness to adopt organic package of practices of Turmeric. It was found that turmeric growers had medium to high level of willingness to adopt the recommended agricultural practice. And among selected socio-economic variables respondent's total family member, Members help in family farming and adult male had negative and significantly relationship with willingness to adopt the recommended

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agricultural practices of organic turmeric. Private extension actors and State Horticulture Department training were continually motivating them to adopt recommended agricultural practices of organic turmeric.

Keywords: Willingness to adopt; tribal famers; organic turmeric; recommended agricultural practices; socio-economic variables.

1. INTRODUCTION

Over the past 4000 years Indians has been utilizing turmeric primarily as a healing medicine among other uses of this golden colored spice. Turmeric has its traces in Ayurveda, Siddha, Unami traditional medicines as well as in Chinese medicines also. Usage of this spice spread in Southeast Asia specially with religions like Buddhism and Hinduism as the yellow dye is used to color the robes of monks and priests, and throughout the world with merchant or Traders. In medieval Europe turmeric is called as 'Indian Saffron' [1]. From decades Indians used Turmeric as natural and inexpensive beauty aid like 'Kumkum' and 'Parani'. And primarily turmeric is the major ingredient of almost all Indian cuisine and used in every household as a natural coloring agent as well as add flavor to various culinary preparations [2]. Turmeric (*Curcuma longa.)* has significant amount of antibacterial and anti-inflammatory property used vigorously in phytochemical industries, in spices industries, food processing industries, and cosmetics industries as a chief ingredient for beauty cream, medical soap etc. [3]. India contributes 50 percent of the worldwide turmeric production. As per the report of Trade Promotion Council of India (TPCI) 2019, India is a largest producer and exporter of turmeric. It has exported worth of US $ 236.5 million of turmeric in 2018 US $ 182.53 million in 2017 [4]. Odisha contributes 5.76 percent shares and 54.50 tons of production. In Odisha, Kandhamal turmeric is produced 'Organically', cultivated by the Kondh group of tribal communities. Kandhamal district stands first in area as well as production i.e., annually about 16,000 ha. Area cultivated by about 60,000 farmers with an annual production of about 40,000 Mt. The local variety grown from time immemorial is having 2 – 3% curcumin, 12.15% of oleoresin and 5.3% of volatile oil but with low market value [5]. An investigation on Economics of Organic Turmeric Cultivation in Kandhamal District of Odisha reveals that turmeric is one of the most important spice crops grown in Kandhamal district; however, the productivity is continuously decreasing year by year and need to increase the productivity to fulfill the domestic requirement and for export [6]. Turmeric produced by the tribal farmers of Kandhamal gets the GI tag on 1st April 2019 as 'Kandhamal Turmeric', and is famous for its healing properties. Kandhamal turmeric had a great potential and can be exported. With support of the cooperative society Kandhamal stands to be the only state sponsored organized marketing channel operating [7]. Generally, Turmeric is cultivated in uplands, hill slopes and even on hilltops where shifting cultivation (PODU) is practiced some farmer blindly belief in the traditional techniques [8]. Hence, adoption of new technology may not get desired amount of yield and thus may incur even more losses, moreover, some of the farmers show gradual interest in adoption of recommended technologies of organic Turmeric cultivation practices to increase the yield promoted by KASAM and state department of Horticulture [5]. This Turmeric crop is the chief source of livelihood for tribal farmers of Kandhamal and these farmers are socio-economically and educationally backward as compared to the non-tribal farmers [9]. Recommended agricultural practice of Turmeric is capital intensive and needs more investment and Tribal farmers are incapable to invest required inputs and unable to bear more risk. Indigenous technical knowledge acquired by the farmers need to be tested and refined with the modern techniques [10]. Hence, they adopt traditional methods of farming, i.e., ancient style of farming including indigenous knowledge, traditional tools, natural resources, slash and burn cultivated or shifting cultivation etc. Moreover, the reason behind farmers adopting traditional method of farming depends upon social and economic factors such as income of farmers, education of farmers, employment, community safely and social supports [11]. And these socio-economic characteristics has profound relation with willingness of these farmers to adopt recommended agricultural practice of organic turmeric [12].

2. MATERIALS AND METHODS

The present study was carried out in Kandhamal district of Odisha and with two stage cluster sampling followed by simple random sampling

technique a total number of 90 responding farmers were selected for the study.

Out of 12 blocks of the district 6 Blocks were selected randomly, viz., Khajuripada, Phiringia, Daringbadi, Raikia, G. Udayagiri, K. Nuagaon and then 3 gram-panchayats selected randomly from each of the block to form cluster of 18 GP/villages out of a total of 6 blocks. Again, from each GP/village, 5 farmers (respondent) were selected randomly, so a total of 15 farmers (respondent) from each block selected with the help of random sampling technique to form a total sample size were 90 farmers.

In this study, Religion, Caste, Experience in Agricultural Activities and Allied Activities, Age, Education, Annual Income, Mode of fund, Family type, Number of family members, Member help in family farm, adult male, adult female as independent variables and Attitude towards Organic Turmeric considered as Dependent Variables. There were 26 statements (15 positive and 11 negative statements) in the selected attitude scale with negative and positive statements. Responses categorized into 5 continuums as; strongly agree, agree, not decided, disagree and strongly disagree with 5,4,3,2 &1 scoring for positive and reverse scoring for negative statements.

3. RESULT AND DISCUSSION

It can be seen from the data presented in Table no.1, that majority of the respondents were Hindu's farmers (66.7%), followed by Christian farmers (33.3%) and selected blocks of Kandhamal were dominated by schedule tribe population those are mostly belong follow Hinduism or Christianity. Majority (76.7%) of respondents were from ST caste followed by 23.3 percent belongs from SC caste category. These Schedule Tribe i.e., Kandha categories farmers cultivated more organic turmeric than Pano categories i.e., Schedule Caste farmers traditionally. Majority of the respondents having (76.7%) medium level i.e., 27 to 36 years of experience in agricultural activities followed by 13.3 percent farmers were involved in agriculture more than 37 years' and considered as higher level of experience and only 7.7 percent were having less than 27 years of experience in agricultural activities. More than half (63.3 %) of farmers were 14-26 years of experience in allied activities i.e., medium level, followed by 23.2 percent of farmers were (highly) more than 27 years of experience in allied activities and only 13.2 percent farmers were less than (low) experience in allied activities. More than half (52%) of the respondents were old age (above 50 years) farmers, followed by 45.6 percent of medium age (36-50 years) group of farmers and 2.2 percent of them from young age (below 35) group of farmers respectively. Mostly old age group of farmers only cultivating more organic turmeric compared than medium and young age group of farmers. A vast majority of the respondents were illiterate (97.8%) and followed by 2.2 percent of respondents were up to

Fig. 1. District map of Kandhamal District, Odisha

Table 1. Distribution of socio-economic characteristics of Kandhamal Farmers (N=90)

Variables	Categories	Frequency	Percentage
Religion	Hindu	60	66.7
	Christian	30	33.3
Caste	ST	69	76.7
	SC	21	23.3
Experience in Agricultural Activities	High (> 35 score)	12	13.3
	Medium (26-35 score)	69	76.7
	Low (< 26 score)	7	7.7
	Mean score	30.92	
	Standard Deviation	4.43	
Experience in Allied Activities	High (> 26 score)	21	23.2
	Medium (13-26 score)	57	63.3
	Low (<13 score)	12	13.2
	Mean score	20.11	
	Standard Deviation	6.63	
Age	Old (above 50 years)	47	52.2
	Medium (36-50 years)	41	45.6
	Young (Below 35 years)	2	2.2
Education	Illiterate	88	97.8
	Matriculation	2	2.2
Annual Income	Less than 50,000	8	8.9
	1 to 1.5 lakhs	81	90
	1.5 to 2.0 lakhs	1	1.1
	Mean score	1.92	
Mode of Fund	Own funds	89	98.9
	Borrowed fund	1	1.1
Family Type	Nuclear	88	97.8
	Joint	2	2.2
Total Family Members	Above 6 members	16	17.7
	3-6 members	64	71.1
	Less than 3 members	10	11.1
	Mean score	5	
Members in Family Farm	Above 3 members	10	11.1
	Only 2 members	50	55.6
	Only 1 member	30	33.3
	Mean score	1	
Adult Male	Above 3 members	13	14.4
	Only 2 members	68	75.6
	Only 1 member	9	10
	Mean score	3	
Adult Female	Above 3 members	17	18.9
	Only 2 members	65	72.3
	Only 1 member	1	8.9
	Mean score	3	

matriculation level of education. None of the selected respondents were studied intermediate as well as graduation level of education as because of the social backwardness and no access of educational institutes might be the reason of large number of illiteracies among the sample size. All farmers were belonging to tribal community so their income source was very low. Majority of respondents (90%) were having annual income up to 1-1.5 lakh, followed by 8.9 percent farmers annual income was less than 50,000 and only 1.1 percent farmer's annual income was 1.5-2.0 lakh. A vast majority (98.9 %) of respondents were spending their own money on farming and few of respondents only 1.1 percent respondents were borrowed funds from public banks for farming; again, 97.8 percent of the responding farmer's lives in nuclear families and few of farmers around 2.2 percent live in joint families in the society.

Majority (71.1%) respondents were having 4-5 number of family members where as 17.7 percent of respondents have more than five numbers of family members. And 11.1 percent respondents have very few numbers of members in their family respectively. More than half of (55.6 %) respondents were moderately number of family members help in family farming where as 11.1 percent of respondents have a greater number of family members help in family farming. And 33.3 percent respondents have very few numbers of family members help in family farming in their family respectively. Majority of 75.6 percent respondents were having maximum number of adult males where as 14.4 percent of respondents have less adult male. And 10 percent respondents have very few adult males in their family respectively. Majority of 78 percent respondents were having maximum number of adult females where as 21 percent of respondents have fewer adult females. And one respondent had very few adult females in their family respectively.

This result was at par with Ananthnag, *et.al.* [13], Kumar, et.al., [14] and Kankate, et.al., [15].

It can be seen from the data presented in Fig. 1 that majority (39.9%) of respondents were moderately interested to adopt the recommended agricultural practices of organic turmeric whereas nearly equal to 37.8%of respondents had high willingness to adopt the recommended agricultural practices of organic turmeric, they have been cultivating traditionally from the beginning. They do not want to risk taking for accepting the recommended agricultural practices of organic turmeric. And giving them KASAM and Horticulture Department training and repeatedly motivating them for accepting recommended agricultural practices of organic turmeric and farmers see results from other fields, they are more likely to adopt recommended agricultural practices of organic turmeric. And they also think that adopting new technology or scientific way of farming can improve our financial condition, besides this 22.3% of respondents had very less willingness to adopt the recommended agricultural practices of organic turmeric. Because the less amount of old age group of farmers motivated for adopting scientifically method because they have been cultivating traditionally for many years and reaping the benefits, so cannot take risks by adopting new methods for agricultural practices or any new technology.

This result has similarities of the studies of Latawiec, *et.al.* [12], and Mamun, *et.al.* [16].

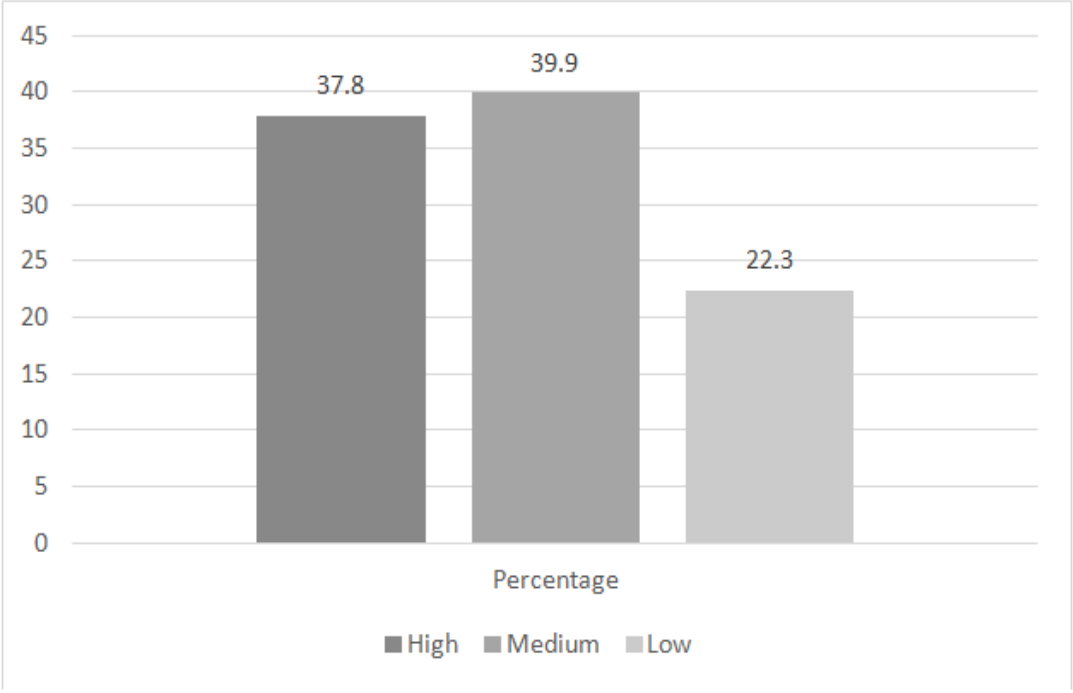

Fig. 2. Attitude towards recommended agricultural practices of Organic Turmeric (n=90)

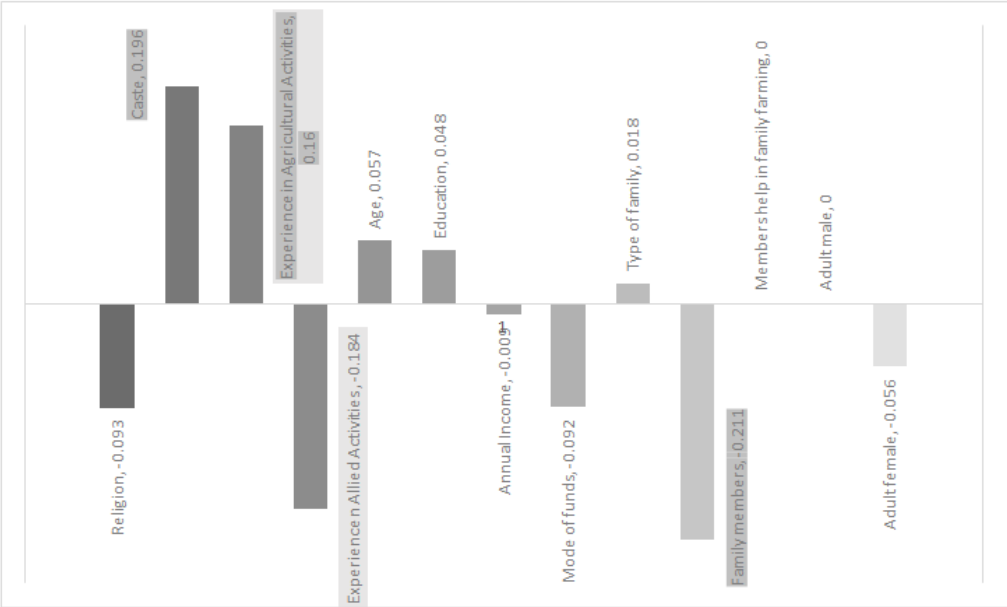

Fig. 3. Correlation between socio-economic variables & willingness to adopt (Details tabulated in Table 2[*])

Table 2. Correlation between socio-economic variables & willingness to adopt[*]

S. No.	Variable	Correlation
1.	Religion	-0.093 (NS)
2.	Caste	0.196 NS
3.	Experience in Agricultural Activities	0.160 NS
4.	Experience n Allied Activities	-0.184 (NS)
5.	Age	0.057 NS
6.	Education	0.048 NS
7.	Annual Income	-0.009 (NS)
8.	Mode of funds	-0.092 (NS)
9.	Type of family	0.018 NS
10.	Family members	-.211[*]
11.	Members help in family farming	-.273[**]
12.	Adult male	-.279[**]
13.	Adult female	-0.056 (NS)

*NS = Non-significant, * Significant at 0.05 level of probability, ** Significant at 0.01 level of probability*

The data given in Fig. 2, clearly indicate that religion, Caste, Experience in Agricultural Activities and Allied Activities, Age, Education, Annual Income, Mode of funds, Type of family, adult female of the respondents had non-significant relationship with willingness to adopt recommended agricultural practices of organic turmeric. Hence, the null hypothesis that "there is relationship between religion, Caste, Experience in Agricultural Activities and Allied Activities, Age, Education, Annual Income, Mode of funds, Type of family Adult female with depended variable'' was accepted. Whereas Family members, Members help in family farming and adult male has negative significant relationship with willingness to adopt recommended agricultural practices of organic turmeric. This result has some similarities with the study of Chetri, *et.al.* [9]. The probable reason behind that number of family member support encourage farmers more towards chemical bases farming system is more labour intensive especially for intercultural operation of various crops and on contrary less family support pushes towards traditional or natural farming which is less input intensive.

4. CONCLUSION

These Kandhamal farmers were mostly old in age category from Hindu religious belief system. Majority of these respondents were from Schedule Tribe caste category with medium level of experience in agricultural activities i.e., 27 to 36 years, whereas more than half of farmers were having 14-26 years of experience in allied activities. A vast majority of the respondents were illiterate and having annual income up to 1-1.5 lakh; spending their own money on farming. Respondents mostly living in nuclear type of families with 4-5 number of family members, among them more than half of respondents having upto 2 number of family member help in family farming. As most of the farmers were from low-income category with less family member support depending on traditional method of cultivation almost no usages of any chemical inputs. But reported less productivity compared to area coverage. As per the gray literature supported that with effort of organizational support there is a cope to promote recommended agricultural practices of Organic Turmeric. This study also reveals that respondent having medium to high level of willingness to adopt these recommended packages of practices. But then again number of family members, members help in family farming and adult male has negative significant relationship with willingness to adopt recommended agricultural practices of organic turmeric

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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