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Factors influencing tribal farmers to adopt modern farming in Hazaribag Jharkhand

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Abstract

The study titled "Factors Influencing Tribal Farmers to Adopt Modern Farming in Hazaribag District, Jharkhand" was conducted to examine the personal characteristics, knowledge levels, adoption rates, and the key factors that influence the adoption of modern farming practices among tribal farmers. The study also aimed to identify the constraints faced by these farmers during the adoption process. The research was carried out in Churchu block of Hazaribag district with a random sample of 120 respondents. A structured interview schedule was used to collect primary data, which was analyzed using appropriate statistical tools. The findings revealed that the majority of respondents had a moderate level of influence from the identified factors.

Keywords: Modern farming, knowledge, adoption, factor influencing

Introduction

Agriculture is the main source of food and income of people across countries. The basic reason behind the sustenance of human life on earth is the agriculture sector, as every human being consumes food for their survival. For years, farming involved only the cultivation of essential food crops. The ancient farming methods in most parts of the world were subsistence oriented. The onset of Green Revolution in the 1960's has helped the agricultural systems in developing countries to make remarkable achievements in crop production. Today, agriculture has become an activity demanding profitability and higher returns (Chacko, 2017) [2]. Agriculture not only contributes to the economy of developing countries, but also shapes the social fabric of the society.

Agriculture is a miscellaneous and extensive sector involving a large number of actors (Borthakur and Singh, 2012) [8]. It is indispensable for the sustenance and growth of the Indian economy. Indian agriculture comprises of diverse traditional agricultural practices which is the result of various agro climatic conditions, soil type and vegetation.

The product of adaptation of farming practices to the local environment is the Indigenous agricultural knowledge (David *et al*, 2012) [4]. Traditional agricultural practices have been an integral part of food production in India since ages and have the potential to mitigate the adverse effects of climate change Thousands of crop species and varieties have been domesticated, improved and conserved by the traditional farmers, using their traditional knowledge.

Viewing from the perspective of quality and health, the traditional agricultural practices could meet the requirements of people.

Sustainability of environment and food production is among the greatest challenges of the agriculture sector. The technological reform in agriculture took place during 1960's with the introduction of high yielding varieties, chemical fertilizers, pesticides and technological advancement for productivity and growth of the farm sector.

The pressure on the farmers for meeting the needs of increasing population tempted them to find ways and means to increase the crop yield. The economic transition also put pressure on farmers to intensify crop production in order to improve their income and brought modern agricultural practices to the front. The use of chemical inputs, machineries, hybrid seeds, irrigation, improved means of transportation and communication, industrialization and others paved way for a modern era in agriculture. This marked for a shift from subsistence production to surplus production. The need of farmers to purchase inputs and services, increase the yield and income, and improve their standard of living could be achieved only through the sale of more produce, which is not possible through subsistence production and by using the traditional agricultural practices alone.

The adoption of modern practices is not a sudden change that took place. Continuous research and development brought about alterations to the different traditional methods being followed. In terms of increasing the yield and reducing the work burden, modern agricultural practices have made several contributions towards farming. The

increase in productivity has helped in feeding millions, who otherwise would have been left starving (Sangha, 2014).

The tribal economy is a traditional one characterized by high dependence on agriculture (Jalaja and Kala, 2015) [1]. According to 2011 census, the tribal population in India is about 8.14% of the total population. Adoption of settled agriculture by the tribes is a breakthrough in the history of agriculture and hence paved the way for long lasting changes in agriculture.

The ancient tribes do not have a major part in agriculture as they were mostly hunters and food gatherers. Shifting cultivation or Slash and Burn cultivation was the common farming practice adopted by most of the tribes in India (Chacko, 2017) [2]. Slash and burn cultivation can be defined as a practice, that is most complex and multifaceted form of agriculture, and consists of cyclic nature, under which selection of fields, clearing them, drying and burning debris for cultivation is carried out (Sati and Rinawma, 2014). This practice was then stopped because of the change in social circumstances and institutional factors (Chacko, 2017) [2]. Later, the tribal farmers started settled agriculture, where they cultivated different crops using traditional practices evolved over time.

The traditional farming systems were labor intensive and were carried out with the complete participation of all the members of the family. A shift from subsistent food crop cultivation to market oriented cash crop cultivation practices has been witnessed in the agricultural sector since the late 1970's (Chacko, 2017) [2]. Initially the tribal farmers had an aversion towards modern farming, and hence kept away from applying chemical fertilizers and pesticides. However, in later stages, due to the influence of several factors, the young generation among them started developing an interest towards modern farming in a limited manner. With the flow of time, the young farmers insisted on the use of modern cultivation techniques on a small scale. Since the tribal farmers did not want to rely on external labors for replacing the young farmers who were hesitant to completely follow traditional methods, the tribal farmers were forced to adopt modern farming methods, but without compromising much on the traditional knowledge. Gradually, complete replacement or partial modification took place in most of the traditional farming methods practiced.

Today, the agricultural practices followed by the tribal farmers have moved away from the ancient methods and can be claimed lying somewhere between the traditional and the modern farming practices. The agricultural sector in India is undergoing significant transformation, driven by technological advancements, changing climatic conditions, and evolving market dynamics. Tribal farmers, such as those in the Hazaribagh district of Jharkhand, form a vital part of this agrarian structure. Despite their reliance on agriculture as a primary livelihood source, many tribal farmers continue to depend on traditional farming methods that often lead to suboptimal yields, soil degradation, and vulnerability to changing environmental conditions.

Modern farming methods, including the use of improved seeds, fertilizers, irrigation technologies, and mechanization, have proven to enhance productivity, ensure efficient resource use, and provide resilience against climatic variability. However, the adoption of these methods among tribal farmers remains uneven and influenced by a complex interplay of factors.

In the context of Hazaribagh, these factors include economic limitations, such as limited access to credit and high input costs, and social constraints, like low levels of education, landholding patterns, and cultural attachment to traditional practices. Additionally, institutional factors such as the effectiveness of agricultural extension services, availability of subsidies, and government support schemes also significantly impact adoption rates. Other critical factors include market accessibility, exposure to modern practices through training or demonstration programs, and the influence of community leaders or cooperatives.

Furthermore, tribal farmers often face challenges related to trust and perceived risks associated with modern technologies. The fear of crop failure, lack of knowledge, or difficulty in accessing technical assistance can deter them from transitioning to modern methods.

Given the socio-economic and cultural diversity of tribal communities in Hazaribagh, understanding these influences is essential. This study aims to explore these factors in-depth, highlighting the barriers and facilitators to adopting modern farming practices. By doing so, it seeks to provide actionable insights for policymakers, agricultural extension workers, and development practitioners. This, in turn, can help foster sustainable agricultural growth, improve food security, and uplift the livelihoods of tribal farmers in Hazaribag and similar regions across in India.

Materials and Methods

The study was conducted in purposively selected district of Hazaribag of Jharkhand. One block namely Churchu block was selected for the selection of respondents. Churchu block consists of 41 villages, 6 villages were selected from the block. The respondents were selected on the basis of availability of maximum numbers, making the total sample size of 120 farmers.

Data collection and analysis

Data was collected through personal interviews with the selected respondents. A structured interview schedule was prepared to insure consistency and relevance in data collection. The collected data was analysed using appropriate statistical tools. Descriptive statistics such as frequencies, percentages, mean and standard deviations was employed to summarize the demographic and socio-economic characteristics of the respondents.

Extent of factors influencing tribal farmers to adopt modern farming

To measure the factor influencing in adoption of the respondents about the modern farming, 9 questions were asked from them and their responses were recorded on 3-point continuum scale as Agree, Undecided and Disagree and given 3,2,1 score respectively. The following analysis will show that these are a good deal of variations also in the factor influencing in adoption of different practices while practices are fully adopted, partially adopted and not adopted as per recommendation.

Table 1: Socio economic profile of the respondents

Sl.no.	Socio-economic profile of the respondents		Frequency	Percentage
1.	Age	Low (20-35 years)	32	26.67
		Medium (36-55 years)	60	50.00
		High (>55 years)	28	23.33
2.	Education	Illiterate	23	19.17
		Primary school	38	31.67
		High school	24	20.00
		Intermediate	19	15.83
		Undergraduate	16	13.33
3.	Land holding	small (<2 ha)	35	29.16
		Medium (2.1 to 4.0 ha)	55	45.83
		Large (>4.0 ha)	30	25.01
4.	Occupation	Agriculture	38	31.67
		Agriculture + business	28	23.33
		Agriculture + service	33	27.50
		Agriculture + labour	21	17.50
5.	Annual income	Low (<1.5 lakh)	53	44.17
		Medium (1.6 to 4.5 lakh)	42	35.00
		High (>4.6 lakh)	25	20.83
6.	Family size	Small family size	40	33.33
		Medium family size	56	46.67
		Large family size	24	20.00
7.	Extension contact	Low	31	25.83
		Medium	63	52.50
		High	26	21.67
8.	Mass media exposure	Low	45	37.50
		Medium	49	40.83
		High	26	21.67
9.	Scientific orientation	Low (3-6)	36	30.00
	S	Medium (7-10)	56	46.67
		High (11-14)	28	23.33
10.	Risk orientation	Low (6-10)	44	36.67
10		Medium (11-15)	60	50.00
		High (16-20)	16	13.33

- Most farmers are in the middle-age group (36-55), suggesting they are likely to be active decision-makers on the farm.
- The majority of farmers have basic schooling, but higher education levels are relatively low, which may impact awareness and adoption of modern techniques.
- Nearly half of the farmers hold medium-sized plots, which may offer some flexibility in trying new farming practices.
- A significant number of farmers engage in multiple occupations alongside farming, likely to supplement their income.
- A large portion of the respondents fall in the low-income category, indicating financial constraints could limit modern farming adoption.
- Medium-sized families are common, which may influence labor availability for farm work.
- Extension services play a key role in spreading awareness; moderate contact suggests there is room to improve outreach.
- Most farmers have some exposure to media like TV, radio, newspapers, or internet, which can influence knowledge and adoption of modern practices.
- Scientific orientation reflects openness to new technologies and innovations. A higher level can positively influence adoption.
- Risk orientation indicates willingness to experiment with or invest in new methods. Most farmers are cautious but open to change.

Factors influencing tribal farmers to adopt modern farming by the respondent

This table shows how strongly different factors influence tribal farmers' decision to adopt modern farming practices. Respondents rated their level of agreement with each factor on a 3-point scale: Agree (score = 3), Undecided (score = 2), Disagree (score = 1). The frequencies (F) and percentages (%) represent the number and proportion of farmers who selected each response for each factor.

Table 2: Extent of factors influencing to adopt modern farming by the farmers.

S. No.	Particulars	Factors influencing					
		Agree		Undecided		Disagree	
		F	%	F	%	F	%
1.	Influence of television	92	76.67	19	15.83	9	7.50
2.	Influence of radio	65	54.17	18	15.00	37	30.83
3.	Influence of newspaper	76	63.33	23	19.17	21	17.50
4.	Influence of internet	108	90.00	9	7.50	3	2.50
5.	Modern extension methods (e.g. group discussion, training, demonstration, exhibition,etc.,)	103	85.83	15	12.50	2	1.67
6.	Lack of labour availability to operate modern equipment/tools	91	75.83	17	14.17	12	10.00
7.	Difficulty adjusting to modern technology due to changes in family structure	75	62.50	34	28.33	11	9.17
8.	Availability of subsidies supporting the use of modern technologies	102	85.00	15	12.50	3	2.50
9.	Influence of modern cultural factors on community acceptance	83	69.17	27	22.50	10	8.33

Table 3: Overall Distribution of factors influencing tribal farmers in adoption of modern farming.

S.no.	Factor influencing	Frequency	Percentage
1.	Low (13-21)	12	10.00
2.	Medium (22-30)	68	50.67
3.	High (31-39)	40	33.33
Total		120	100

As per Table 3 a majority of respondents (50.67%) were moderately influenced by the listed factors, followed by (33.33%) who experienced a high level of influence and only (10.00%) who reported low influence.

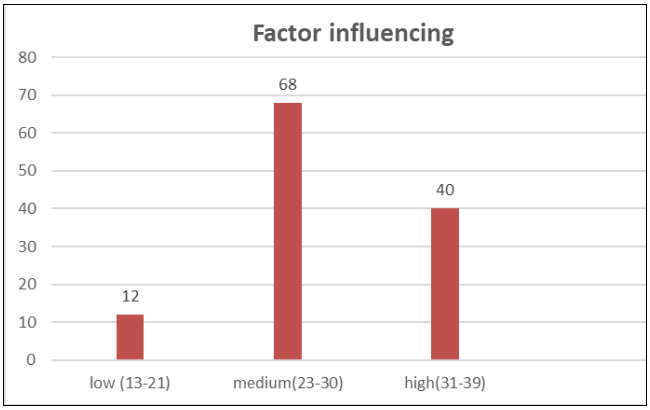

Table 4: Association between Independent Variables and Factors Influencing n=120

S.no	Characteristics	'r' value
1.	Age	0.802955
2.	Education	0.976221
3.	Land size	0.755929
4.	Occupation	0.572856
5.	Annual income	-0.38988
6.	Family size	0.5000
7.	Extension contact	0.797017
8.	Mass media exposure	0.162758
9.	Scientific orientation	0.693375
10.	Risk orientation	0.359211

The above Table-4 indicates the association between independent variables and the factors influencing tribal farmers to adopt modern farming methods by using Karl Pearson's Co- efficient of Correlation. The results depicts that the selected characteristics of farmers such as age, education, land size, family size, occupation, extension contact, mass media exposure, scientific orientation, risk orientation except annual income. The Churchu block tribal farmers have started to adopt modern farming though they have not completely adopted the modern methods.

Conclusion

The study revealed that the majority of Tribal farmers in Churchu block exhibit a moderate level of influence from various socio-economic and institutional factors in adopting modern farming practices. Key influencing variables include education, landholding, extension contact, and scientific orientation. Despite challenges, tribal farmers Are progressively embracing modern techniques, although not yet at an optimal level.

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