

Modernisation of Agricultural Activities Among the Farmers of Birbhum District, West Bengal: A Socio-Economic Perspective

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Abstract : *Modernisation of agriculture is a process of transforming agriculture from traditional labour-based agriculture to technology-based agriculture. Agricultural modernisation relates to increase inputs in farming, like fertilizers, chemical pesticides, improved farm implements, mechanization, high yielding variety seeds, irrigation, storage, electricity supply to achieve more crop yield. The income earned by farmers from agricultural activities after paying for input costs and the wages for hired labour has seen low to high growth in different periods during the last three decades (Saxena and Rana, 2015). The modernisation among farmers is also influenced by economic, social, political and industrial factors apart from nearness to towns and cities. It is determined by the methods and techniques adopted by the farmers and application of the modern inputs. The present paper discusses the level of modernisation among farmers and its spatial variation in Birbhum District of West Bengal. Modernisation of agriculture is supposed to ensure productivity growth without imposing any threats to the natural environment in accordance with the principles of sustainable development. This study is based on primary data collection of 11 villages of Birbhum District.*

Key words: *Modernisation of agriculture, Farmer, Modern inputs, Sustainable development*

Introduction

Agriculture plays a pivotal role in the Indian economy. Although its contribution to gross domestic product (GDP) is now around one sixth, it provides employment to 56 per cent of the Indian workforce. The small and marginal farmers still today lack the technology knowhow at their farm lands. Small holdings play important role in raising agricultural development and poverty reduction (Dev, 2012). Agriculture sector in India is a primary source of livelihood for a majority of the population. Low and stagnant income in the sector remains a focal point of policy debate. The most prominent pathways to enhance farmers' income is the adoption of improved agricultural technologies. The knowhow of the technologies will boost their confidence and better marketing opportunities will make them independent where the intervention of middlemen will become absent. Agricultural marketing in India suffers from inefficiency, a disconnect between the prices received by producers and the prices paid by consumers, fragmented marketing channels, poor infrastructure

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and policy distortions. Urgent reforms are needed to address these inadequacies and check the excesses of middlemen (Chand, 2012). The adoption and implication further depend on the willingness to accept is mainly related to personal factor like age, education, family size, caste, etc., whereas the ability to modernize the farming depends upon economic factor like creation of necessary infrastructure, capacity to invest, risk bearing capacity, etc. The individual characteristic of the farmers such as social status, off farm income, nearness to cities or towns, etc., has a profound influence on modernisation (Singh, S, 1976). On the basis of the above studies an attempt is made to examine the level of modernisation among farmers and its spatial variation in Birbhum District of West Bengal.

Study Area

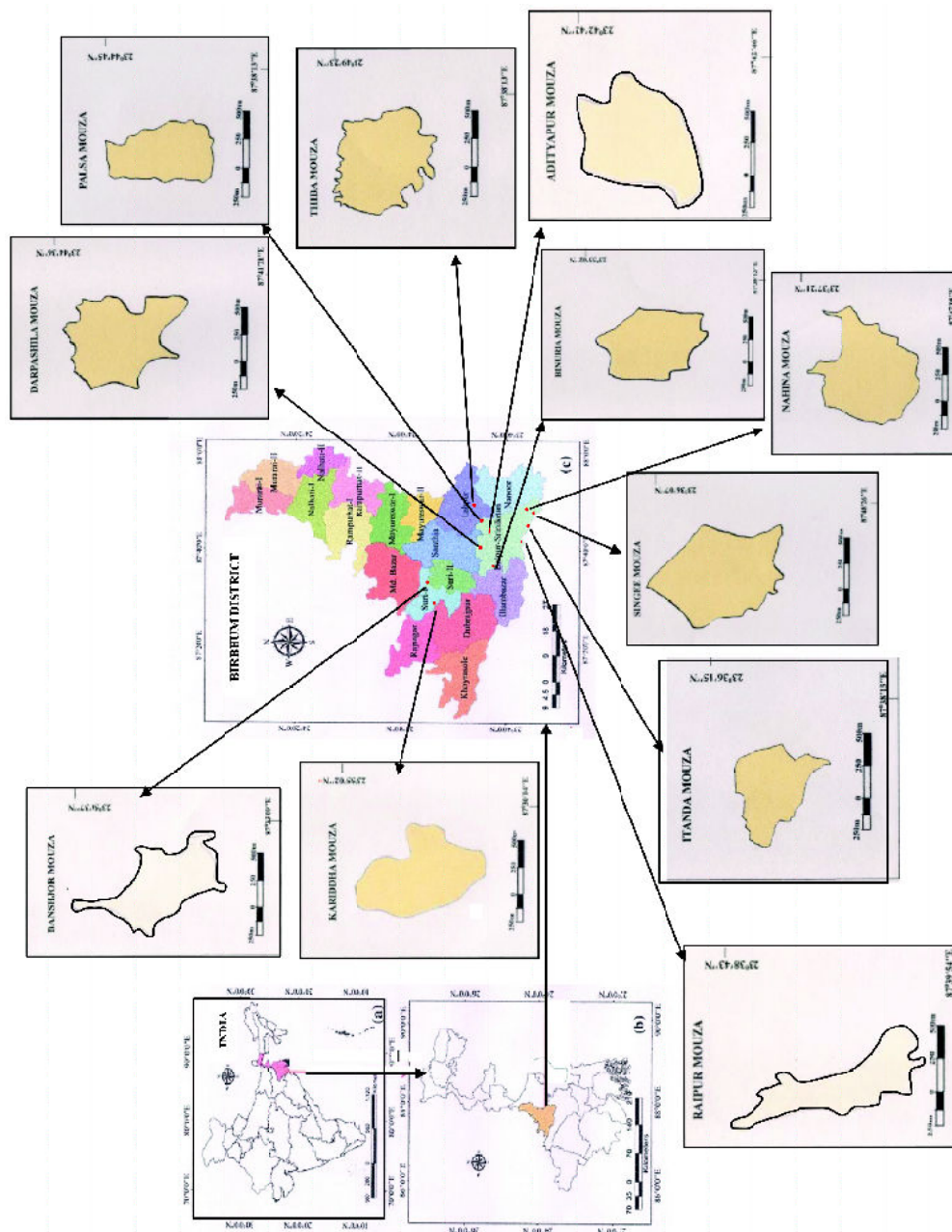
Birbhum district, a part of the “Rār̥h Region” is situated between 23° 32' 30" and 24° 35' 00" North latitude and 87° 05' 25" and 88° 01' 40" East longitudes, and about 4,545 square kilometres (1,755 sq. mi) in area. River Ajay forms the southern base and the apex of the triangle points north. The river forms the boundary between the districts of Birbhum and Bardhaman. The rivers Mayurakshi, Hinglow, Bansloi, Kopai, Bakreswar, Siddheswari, Brahamani, Dwarka etc. pass through different blocks of the district. The state of Jharkhand is at the northern and the western border of Birbhum and Murshidabad is at the east.

This area lies at the north-eastern end of the Chhotanagpur Plateau, as it slopes down and merges with the alluvial plains of the Ganges. In the district there is only hilly area of natural rock formation situated near Dubrajpur town called Mama-Bhagne Pahar (Hill). The western portion of the district is an undulating upland that is generally barren. The area of the district lies under 3 Agro-climatic Zones of the State namely (1) Gangetic Alluvial Zone, (2) Vindhyan Alluvial Zone, (3) Undulating Red and Laterite Zone. The comparatively more fertile eastern portion, constituting the north-eastern Rār̥h region, merges with the Gangetic plain. The climate on the western side is dry and extreme but is relatively milder on the eastern side (<http://www.rkvk.ac.in/DistrictProfile.html>).

Data and methodology

To measure the level of modernisation among farmers, primary data was collected from 11 sample villages. For the selection of villages, the district was stratifying on the basis of relief and irrigation which are pivotal in deciding the farming operations. Eleven villages were selected with reference to accessibility and nearness to urban centres and district head quarter. From each of these villages 20 respondents were selected on the basis of size of land holding such as small, medium and large. Thus 220 framers were chosen and interviewed at their residences. The sample villages are Raipur, Adityapur, Banshgor, Karidhya, Benuria, Singi, Darpashila, Itanda, Palsa, Nahina and Thiba.

The data were collected on various aspects related to agricultural modernisation. While the modernisation is measured on selected parameters, such as usage of selected organic manures,



Source: BDO Offices, Bolpur-Sriniketan, Labpur, Suri-I
<https://earth.google.com/web/search/birbhum>

Fig.: 1 Location of the study area

self-mixed chemical fertilizers, tractors, owning of pump sets (electric or diesel), years of owning pump sets, number of farmers availing, agricultural loans, etc. The farmers' socio-economic characteristics like size of the family, age group, level of education, income, caste, distance to the district headquarters etc. were also gathered. In order to bring out relative importance among the factors and farmers the data is subject to tabulation in which relative weightages have been given for different variable considered for measuring modernisation of agriculture. For example, number of farmers using agricultural machineries and implements have been scored as follows. If a farmer owned a plough, he is given a weightage of 2, if he rented it the score is 1. Likewise, the power sprayers owned 5 and rented 2; hand sprayers owned 2 and rented 1. Based on this process of scoring, the individual scores of the farmers in each village have been summed up. Finally based on the values of summations, the 11 villages are grouped into four categories. The villages which got very high and high scores grouped under very high and high level of modernisation. Villages having very low scores have been kept under *low* level of modernisation. Moderately modernized villages come in between these two groups.

The total scores achieved by the farmers in the sample villages is shown in Table 1. From the table it is clear that the value scored by different villages between 292 and 721. From the table four distinct groups could be identified by drawing cut off lines where the difference is large between two successive values.

Table 1: Individual total score of the sample villages

Village	Total Score
Raipur	721
Adityapur	645
Banshgor	637
Kariddha	629
Benuria	518
Singee	507
Darpashila	435
Itanda	420
Palsa	357
Nahina	349
Thiba	292

Source: Primary Survey, 2019

Based on the above procedure, Raipur is identified as very highly modernized village. Adityapur, Banshgor and Karidhya village are grouped under high level of modernisation with values ranging 645 – 629. These villages are located near rivers.

Moderate level of agricultural modernisation is established in Benuria, Singee, Darpashila and Itanda villages. These villages are located near to their panchayat headquarters. Normally, the villages lying nearby urban centres will have certain extra advantages over remotely located villages. Even the farmers will also have more awareness towards the modern inputs and better socio-economic profiles than the others. Ultimately it reflects in their attitudes and activities. The same is observed here.

Lastly, the low level of modernisation is identified in the remaining three villages namely Palsa, Nahina and Thiba. Due to interior location, lack of proper accessibility, economic and social backwardness of the farmers, these villages are lagging behind with respect to the overall development. In the case of Thiba village, due to the location of Langalhata Beel and Bakreswar River near Labpur, Government imposed some limitations over their usage of land, fertilizers, pesticides, insecticides, groundwater, etc. here farmers practicing only one crop, preferably paddy cultivation.

Agricultural modernisation among the farmers

Further, the relationship between socio-economic characteristics and level of modernisation among the farmers in Birbhum District. Altogether six aspects have been considered as important in the socio-economic profile of the farmers which plays a significant role in his level of awareness and adaptation of agricultural modernisation. These are, size of the family, age group, education, caste and income. The location of the village with reference to its nearness to the district headquarter is also taken here. In order to know the relationship between the above said aspects and level of modernisation, the relative scores of modernisation variables have been summed up for all the farmers of sample villages in each aspect and to its subgroups. Finally, to get the average individual score for each subgroup, the sum of its score is divided by the number of farmers in the respective group. For example, the aspect of caste of the farmers is sub grouped into three such as General, Scheduled caste and Scheduled tribe. In order to relate the caste and the level of modernisation of the farmer, the scores of the modernisation variables have been added up for all the farmers of sample villages in each subgroup. The general caste farmers (numbered 117) got the total score 3277, scheduled caste farmers (numbered 59) obtained 1508 and scheduled tribe farmers (numbered 44) secured 860. Then the average score of each farmer belongs to general caste, scheduled caste and scheduled tribe is calculated as 28, 26 and 20, respectively. These scores state that the more is the score higher is the modernisation and less is the score lower is the level of modernisation.

Size of the family and agricultural modernisation

Size of the farmers' family is considered as an important aspect in order to measure the level of modernisation. Here the size of family is inversely proportional to the level of modernization (Table 2), i.e. small size family group got highly modernized than the large size families. Therefore, it may be inferred that small family size farmers could adopt modernisation better than large family size farmers.

Age group of the farmers and agricultural modernisation

The relation between age group and modernisation is neither directly nor inversely proportional. The farmers grouped below 30 years are more modernized than the farmers belong to 31- 40 years and 41 - 50 years. Again, the old aged farmers of 51-60 years and more than 60 years are highly modernized (Table 2). This brings forth the fact that the young farmers adopt agricultural modernisation and at the same time the old farmers too due to age and experience come forward to go in for modern measures of agriculture to get better returns.

Education and agricultural modernisation

Education creates more awareness among the farmers towards the adaptation of modern inputs in agriculture. Thus, level of education is compared with that of the modernisation. It is directly proportional to the level of modernization, i.e., lesser the education, modernization is low and higher the education of the farmers more is modernisation (Table 2).

Caste and agricultural modernisation

In the 11 sample villages from 220 farmers, it is found that farmers belonging to general caste secured high scores of modernisations, scheduled castes and scheduled tribes farmers got less scores (Table 2).

Income and agricultural modernisation

Income plays the most important role in the modernisation of agriculture, as it needs large amount of capital. Off farm income is considered as one of the factors for the level of modernisation. Here, the income of the farmers is proportional to the level of modernisation. More is the income, higher is the modernisation, less is the income, modernisation is low (Table 2).

Distance of the household from the District Headquarter and agricultural modernisation

Distance or nearness to the district head quarter or any urban centre is also another important aspect which enables better awareness among the people in general and farmers in particular. Farmers can go easily to the nearest urban centre to buy required inputs like fertilizers, insecticides, pesticides etc. in time.

Table 2: Socio-economic characteristics and agricultural modernisation scores

Sl. No	Item	Average individual scores
1.	Size of the farmers family	
	<4 persons	26
	5-6 persons	25
	7-8 persons	23
	>8 persons	19
2.	Age group of the farmers	
	<30 years	25
	31-40 years	24
	41-50 years	22
	51-60 years	30
	>60 years	30
3.	Education of the farmers	
	Illiterate	23
	Primary	24
	Secondary	29
	Higher secondary	29
	Graduation	32
	Post-Graduation/Professional/Technical	33
4.	Caste of the farmers	
	General Caste	28
	Scheduled Caste	26
	Scheduled Tribe	20
	Other Backward Caste	20
5.	Income of the farmers (Rs./ Year)	
	<5000	20
	5000-10000	21
	10000-20000	24
	20000-50000	25
	>50000	34
6.	Distance of the household from the District Headquarter (in km)	
	<10	36
	10-20	32
	20-30	26
	30-40	31
	>40	19

Source: Compiled by the author from Primary data, 2019

The discussion in earlier paragraphs established the association of socio-economic parameters and their influence on the agricultural modernisation among farmers.

Conclusion

The agricultural share of land in India has declined due to high growth rate of industrial and service sectors. On the other hand, there is a rapid spread of settlements. The increasing population has an ever-growing demand for food. Modernisation of agriculture in the rural area has opened a new horizon for the farmers. It ensures food security among the population. However, still in the study area farmers struggle for better livelihood with higher grade of income from agricultural activities. Modernisation of agriculture may reduce poverty which will have positive impact on the socio-economic condition of the farmers. It may also be helpful in reducing regional disparity.

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