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## Socio-economic profile determining the adoption of innovations among the farmers of Bhagalpur district of Bihar

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**Abstract**

Indian agriculture is highly diverse in nature. It supports a wide diversity of farmers with different social and economic conditions performing agriculture in different ecological niches. They cope up with various stress conditions with their creativity and hard work. In process of dealing with stress they come up with creative solutions and adopt various technologies according to their economic conditions. In present survey 150 farmers were randomly selected and interviewed to determine their adopting behaviour among which, 35 farmers were found to have adopted some new technology or come up with a new solution to existing problem. Socio-economic status of these farmers was determined to study how far these technologies can be replicated in similar socio-economic conditions. From the study it was observed that majority of the innovators (74.29%) belonged to high-income group also the mean land holding of the innovators (6.84) was found to be much higher than non-innovators (3.22). The result was conclusive that the farmers with better socio-economic conditions had higher capacity to take risks, try new technologies in their farms.

**Keywords:** Socio-economic status, innovators, adoptors

**Introduction**

Crop production and productivity has grown drastically since mid nineties owing to Green Revolution (high yielding varieties, use of chemical fertilizers, input responsive varieties, good extension services) and the constant emphasis laid upon agriculture in India's five-year-plans. Indian agriculture has seen numerous technological advancements in recent times after green revolution. Despite of these technologies and innovations generated by research organizations, now decades after Green Revolution, Indian agriculture is going through a phase productivity stagnations and decline in some cases. The entire agricultural research and development system is struggling to achieve another breakthrough parallel to green revolution.

It is being strongly realised by agricultural research managers and policy makers that, centralized system of innovation development alone cannot ensure further significant enhancement in system productivity. In addition to this, agriculture production system operates in complex and varied agro-ecological and socio-economic situation. Therefore, the blanket recommendations provided by the research institutions do not hold true and suitable for all the farmers. Farmers' modify any new technology according to their socio-economic conditions and give way to new technology and re-invention that is acceptable by other farmers of that area. As a consequence now scientific community and developmental policy makers are shifting their focus from centralized and institutional technology development system to decentralized grassroots innovations for identification of locally suitable and sustainable farm innovations developed by farmers as an option for agricultural productivity and sustainability. Hence, it is important to study the socio-economic conditions that help farmers to experiment new technologies and adopt innovations in their field.

Innovations generated and adopted at farmer level has many benefits compared to lab originated innovations as it has already been tried in farmer's field, it is many times cheaper, easily disseminate among the population, etc. These innovations are very much important for livelihood and sustainability in agriculture and must not be forgotten. Identifying and documenting these grass-root level innovations can be very useful to other farmers for increasing production and their standard of living.

**Research Methodology**

The study was conducted in Sabour Block of Bhagalpur District. Three villages of Sabour Block namely, Farka, Ghoshpur and English were selected purposively as these villages are selected by Bihar Agricultural University to test impact of ICTs on promotion of relevant

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agricultural technology. The total number of respondents to be selected from these three villages was decided to be 150. An equal number of respondents, i.e., 50 were selected from each of the three villages by simple random sample technique. For drawing samples, a list of farmers of three villages obtained from the concerned Gram Panchayats was used. The variables are Socio-Economic status of the respondents, including their age, education, family size, family type, land holdings, etc. Standard tools were used to measure the variables. The variables were operationalised by assigning scores to responses given by the farmers and measuring those scores using the proper statistical tools results were obtained.

## Result and Discussion

The current study was conducted with the view of assessing the dependency of adoption of new technologies of farmers on their socio-economic characteristics. The factors like age, education, social status, annual income, etc. often supports or hinders the risk taking ability of farmers. The result was derived after the data collected from the farmers were analysed using the proper statistic tools used for data processing. The following table is depiction of analytical comparison of socio-economic variables between the farmers who have adopted the new technology and those who have not adopted the new technology.

**Table 1:** Comparison of socio-economic variables between Innovators and Non-innovators

Sl. No.	Category	Sub-category	Innovators (N=35) Frequency (%)	Non-innovators (N=115) Frequency (%)	Total (N=150) Frequency (%)
1	Age	Young (less than 35 years)	4 (11.43)	31 (26.95)	35 (23.33)
		Middle aged (35 to 50 years)	24 (68.57)	80 (69.57)	104 (69.34)
		Old (>50 years)	7 (20.00)	4 (3.48)	11 (7.33)
2	Educational Level	Illiterate	5 (14.29)	11 (9.57)	16 (10.67)
		Functionally Literate	6 (17.14)	10 (8.69)	16 (10.67)
		Up to Primary School	1 (2.86)	16 (13.91)	17 (11.33)
		Up to Middle school	3 (8.57)	21 (18.26)	24 (16.00)
		Matriculate	7 (20.00)	18 (15.65)	25 (16.66)
		Higher Secondary	5 (14.28)	28 (24.35)	33 (22.00)
		Graduate	6 (17.14)	2 (1.74)	8 (5.33)
		Post-graduate	1 (2.86)	9 (7.83)	10 (6.67)
		Doctorate	1 (2.86)	0	1 (0.67)
3	Land holding	Marginal (< 2.5 acre)	12 (34.29)	55 (47.83)	67 (44.67)
		Small (2.5 acre to 5 acre)	11 (31.42)	51 (44.35)	62 (41.33)
		Medium (5.1 acre to 10 acre)	5 (14.29)	5 (4.35)	10 (6.67)
		Large (>10 acre)	7 (20.00)	4 (3.47)	11 (7.33)
4	Occupation	Farming only	16 (45.72)	47 (40.86)	63 (42.00)
		Farming + Labour	4 (11.43)	20 (17.39)	24 (16.00)
		Farming + Service	11 (31.43)	34 (29.57)	45 (30.00)
		Farming + Business	2 (5.71)	5 (4.35)	7 (4.67)
		Farming + Others	2 (5.71)	9 (7.83)	11 (7.33)
5	Farm implements	Tractor	2 (5.71)	1 (0.86)	3 (2.00)
		Bore-well	22 (62.85)	31 (26.96)	53 (35.33)
		Harvester	2 (5.71)	0 (0)	2 (1.33)
		Diesel Engine	20 (57.1)	25 (21.73)	45 (30.00)
		Sprayer	5 (14.28)	12 (10.43)	17 (11.33)
6	Allied Agricultural activities	None	11 (31.42)	38 (33.04)	34 (22.66)
		Dairy	22 (62.85)	75 (65.21)	97 (64.67)
		Poultry	2 (5.71)	2 (1.73)	4 (2.67)
7	Distribution of respondents according to their income	Low (up to Rs.48,610)	0	3 (2.61)	3 (2.00)
		Medium (Rs.48,611 to Rs.4,91,130)	9 (25.71)	105 (91.30)	114 (76.00)
		High (>Rs.4,91,130)	26 (74.29)	7 (6.09)	33 (22.00)
8	Level of extension contact	Low (up to 8)	2 (5.70)	26 (22.61)	28 (18.66)
		Medium(9 to 19)	22 (62.86)	77 (66.96)	99 (66.00)
		High(more than 19)	11 (31.44)	12 (10.43)	23 (15.33)

It is revealed from Table 1 that the majority of the respondents (69.34%) were middle aged. As many as 35 respondents out of 150 selected for the study were found to have adopted one or the other innovative techniques or ways to enhance their income. The age of the respondents who were the heads of their families has been found to play a significant role in adoption of new innovations which in turn are important changes leading to enhancement in their income. By analysing the educational levels of the respondents it can be observed that maximum respondents of total had studied up to higher secondary (22.00%). Among innovators 6 (17.14%) were graduate and one even had doctorate degree. Sarada (2015) while studying IFN concluded that majority of the innovators were high school

educated and belonged to middle age group. Looking forward to land holding, maximum proportion (44.67%) of farmers had marginal to small land holdings. Large land holdings were more common among innovators (20.00%) than non-innovators (3.47%). Larger land holdings of farmers give them edge over others to experiment new technologies in their fields. Lavanya et al. (2017) [2] studied about the adoption of innovative technology and concluded that majority of adopting farmers were young, graduated, with less farming experience and agriculture as a major activity.

Occupation of farmers plays an important role in innovation and adoption of new technologies as farmers tend to diversify their activities of earning livelihood. Farmers solely depending on agriculture will have to adopt new technologies

to earn more income. In the current study maximum proportion of total farmers (42.00%) are solely dependent on farming. Among innovators a large proportion (45.72%) are dependent solely on farming, giving way to adoption of new technologies. Farm implements like tractors, bore wells, diesel engines, etc determines the economic status of the farmers and allows them to calculate amount of risk they can take. Allied agricultural activities help the farmers in times when his main crop fails. In present survey most of the farmers (64.67%) practised dairy activity along with farming. Dairy gives quickly cash to the farmers and also supports them throughout the year. Some farmers (2.67%) also adopted poultry as their allied activity.

Annual income and extension contact has been marked to have considerable effect on risk taking ability, innovativeness, change proneness, leadership ability, and psychological behaviours of the farmers. The above table depicts that majority of the respondents of innovative category falls under high income level category i.e. 74.29 percent with an average

annual income more than 4 lakhs, a very few of 25.71 percent were having medium income level. Majority of the respondents of non-innovative farmers fell under medium level income category (91.30%) with an annual average income between Rs.48000 – Rs.4 lakhs. Similarly, in extension contact among total score of 32, maximum number of respondents 99 (66.00%) were found to be of medium level extension contact. Among innovators 11 (31.44%) respondents had high extension contact. Among non-innovators extension contact is lower as compared to innovators. 26 respondents i.e. 22.61 percent respondents were found in lower extension contact category.

Economic profile is more or less represented by annual income and land holdings of the respondents and affects other variables too. The Table 2 is summary of average of land holdings and annual income of innovators and non-innovators with standard deviation. It is evident here that innovators have highest mean land holding size (6.84 acres) and annual income (Rs.404444.00).

**Table 2:** Comparative analysis of economic profile of innovators and non-innovators

Categories		f	Average Holding size	Standard deviation
Own Land (acre)	Innovators	35	6.84	8.579
	Non-innovators	115	3.22	2.953
	Total	150	4.07	5.082
Categories		f	Average Income	Standard deviation
Annual income (in Rs.)	Innovators	35	404444.00	342423.254
	Non-innovators	115	228914.00	147527.848
	Total	150	269870.00	221261.369

Larger land holdings and higher annual incomes help farmers in exploiting alternate opportunities and trying new innovations and technologies on their field to enhance their income.

### Conclusion

The result derived from the study was conclusive of the fact that higher socio-economic situation of the farmers helped them to try various alternatives and thus adopting new innovations. It was clearly visible from the analysis that average land holding of innovators (6.84 acres) was greater than non-innovators (3.22 acres) and average annual income of innovators (Rs.404444) was greater than the non-innovators (Rs.228914). Majority of the innovative farmers were falling under high income level category and majority of non-innovative farmers were falling under medium income category.

Majority of the respondents of both innovative as well as non-innovative farmers were marginal (<2.5 acres) or small farmers (2.5-5 acres). Majority of the respondents were middle aged group. Majority of the innovator respondents were educated up to high school or graduated but most of the non-innovator respondents possessed higher secondary education degree. When it comes to allied sectors of agriculture, dairy was more popular among those respondents. Poultry can help increase the income of farmers but very few farmers have adopted it. Innovator farmers possessed various farm implements as compare to non-innovators, most of the respondents had bore-wells installed of their own.

These facts prove that farmers with higher income, larger land holding, better educational qualifications, and allied source of income have higher chance of adopting a new technology.

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