



Impact of NICRA Project on Farm Income and Farm Productivity of Participant Farmers in Lakhimpur District of Assam

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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

The present study was conducted in Lakhimpur district of Assam to measure the impact of the interventions of the National Innovations on Climate Resilient Agriculture (NICRA) Project on farm income and farm productivity of the participant farmers. A total of 160 farmers (80 NICRA participant farmers and 80 non-participant farmers) were selected randomly for the purpose. The data were collected by a personal interview with the help of a structured schedule. The data collected were classified, tabulated and statistically analyzed. The findings of the study revealed that majority of the participant farmers (68.75%) were in the medium farm income category, while non-participant farmers (81.25%) were in the low farm income category. Majority of both participant farmers and non-participant farmers (63.75%) had a medium level of rice productivity. Majority of the participant farmers (62.50%) had a medium level of productivity of potato crop while most of the

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non-participant farmers (56.25%) had a medium level of productivity of potato crop Majority of the participant farmers (56.25%) had a medium level of productivity of rapeseed crop while the majority of the non-participant's farmers (67.50%) had a low level of productivity of rapeseed crop.

Keywords: NICRA; participant farmers; farm income; farm productivity.

1. INTRODUCTION

The impacts of climate change are global. Countries like India are more vulnerable to climate change where agriculture is the main source of livelihood for the majority of the population. Global warming which is a result of climate change affects the production of the farmers [1,2]. Climate change has a great impact on agriculture in several ways, including changes in average temperatures, rainfall, and climate extremes (e.g., heat waves); changes in pests and diseases; changes in atmospheric carbon dioxide and ground-level ozone concentrations; changes in the nutritional quality of some foods [3] and changes in sea level [4]. Future climate change will likely negatively affect crop production in low latitude countries [5,6], while effects in northern latitudes may be positive or negative [7]. Climate change will probably increase the risk of food insecurity for some vulnerable groups, such as the poor [8]. So the present study was undertaken to assess the impact of the interventions of the NICRA Project on Farm income and Farm Productivity of the participant farmers in Lakhimpur district of Assam.

2. MATERIALS AND METHODS

The present study was conducted purposively in Lakhimpur district of Assam because NICRA Project has been implemented there since 2011. The study was conducted in the year 2016-17. From the NICRA Project area a cluster of four villages, viz., Chamua, Borkhet, Orang and Rangajan were selected purposively and from the non-project area four villages, viz., Nogoya, borbali, Talsibari and Rajabari were selected. From each of the selected villages, 20 respondents were selected randomly for the study. Data were collected by personal interview method with the help of a structured schedule. Statistical tools like %, frequency, mean, standard deviation (SD), coefficient of variation (CV) and t-test were used for the analysis of data. To assess the impact of NICRA Project interventions on farm income and farm productivity of the participant and non-participant farmers, the respondents were categorised as

low, medium and high based on mean, coefficient of variation and standard deviation.

3. RESULTS AND DISCUSSION

It is evident from Table 1 that the majority of the participant farmers (68.75%) were in the medium farm income category followed by 16.25 percent in the high farm income category. Only 15.00% of the participant farmers were found in the low annual farm income category.

The coefficient of variation (18.36%) indicated that the participant farmer respondents were relatively homogenous concerning their annual farm income.

Majority of the non-participant farmers (81.25%) were in the low farm income category followed by 13.75% in the medium income category. Only 5.00% of the non-participant farmers were found in the high income category.

The coefficient of variation (29.21%) indicated that the non-participant farmer respondents were relatively homogenous concerning their annual farm income.

The mean annual farm income score of participant farmers (Rs. 115969.62) was much higher than that of the non-participant farmers (Rs. 79180.25). The difference between the mean level of farm income of participant and non-participant farmers was Rs. 36789.37. The significance of the difference between two sample means was tested by employing t-test. The 't' value was found to be significant at the 0.01 level. Hence the corresponding null hypothesis stating that there was no difference between the mean level of farm income of participant and non-participant farmers was rejected. Findings, therefore, indicated that the project interventions had a significant positive impact on the farm income of the participant farmers.

The productivity of three selected crops, viz., rice, potato and rapeseed were taken into consideration in the study. The findings are presented in the sub-sections to follow.

Table 1. Distribution of respondents according to the level of annual farm income

Category (score range)	n=160			
	Participant farmers		Non-participant farmers	
	Number	%	Number	%
Low farm income(Upto Rs. 94670)	12	15.00	65	81.25
Medium farm income (Between Rs.94670- Rs.137268)	55	68.75	11	13.75
High farm income(Above Rs.137268)	13	16.25	4	5.00
Total	80	100.00	80	100.00
Mean	115969.62		79180.25	
S.D	21299.37		23129.83	
C.V	18.36		29.21	

t value = 2.34 is significant at 0.05 level

3.1 Impact on the Productivity of Rice

The findings presented in Table 2 reveals that majority of the participant farmers (63.75%) had a medium level of rice productivity followed by 26.25% with a low level of rice productivity. Only 10.00% of the participant farmers were found with a high level of rice productivity.

The value coefficient of variation (12.34%) indicated that the participant farmer respondents were relatively homogenous concerning their level of rice productivity.

Among the non-participant farmers, the majority of them (63.75%) had low level of rice productivity followed by 36.25% with a medium level of rice productivity. None of the non-participant farmers was found with a high level of rice productivity.

The coefficient of variation (14.89%) indicated that the non-participant farmer respondents were relatively homogenous concerning their rice productivity.

The mean rice productivity score of participant farmers (3177.37 kg/ha) was higher than that of the non-participant farmers (2296.72 kg/ha). The difference between the mean level of rice productivity of participant and non-participant farmers was 880.65 kg/ha. The significance of the difference between the two sample means was tested by employing t-test. The 't' value was found to be significant at the 0.05 level. Hence the corresponding null hypothesis stating that there was no significant difference between the mean level of rice productivity of participant and non-participant farmers was rejected. Findings, therefore, indicated that the project interventions had a significant positive impact on the level of rice productivity by the participant farmers.

3.2 Impact on the Productivity of Potato

It is evident from Table 3 that the majority of the participant farmers (62.50%) had a medium level of productivity of potato crop followed by 20.00% with the high level of potato productivity. Only 17.50% of the participant farmers were found with a low level of productivity of potato crop.

The coefficient of variation (13.01%) indicated that the participant farmer respondents were relatively homogenous concerning their level of potato productivity.

Among the non-participant farmers, most of them (56.25%) had a medium level of productivity of potato crop followed by 43.75% with a low level of productivity. None of the non-participant farmers was found to have a high level of productivity of potato crop.

The coefficient of variation (8.63%) indicated that the non-participant farmer respondents were relatively homogenous concerning their level of productivity.

The mean potato productivity score of participant farmers (15633.75 kg/ha) was higher than that of the non-participant farmers (10875.00 kg/ha). The difference between the mean level of productivity of participant and non-participant farmers was 4758.75 kg/ha. The significance of the difference between two sample means was tested by employing t-test. The 't' value was found to be significant at the 0.05 level. Hence the corresponding null hypothesis stating that there was no difference between the mean level of potato productivity of participant and non-participant farmers was rejected. Findings, therefore, indicated that the project interventions had a significant positive impact on the level of productivity of potato crop by the participant farmers.

Table 2. Distribution of respondents according to the productivity of rice (kg/ha)

Category (score range)	n=160			
	Participant farmers		Non-participant farmers	
	Number	%	Number	%
Low productivity (Upto 2785.05)	21	26.25	51	63.75
Medium productivity (Between 2785.05-3569.69)	51	63.75	29	36.25
High productivity (Above 3569.69)	8	10.00	0	0.00
Total	80	100.00	80	100.00
Mean	3177.37		2296.72	
S.D	392.32		342.15	
C.V	12.34		14.89	

t value = 2.00 is significant at 0.05 level

Table 3. Distribution of respondents according to productivity (kg/ha) of potato

Category(score range)	(n=160)			
	Participant farmers		Non-participant farmers	
	Number	%	Number	%
Low productivity(Upto 13599.38)	14	17.50	35	43.75
Medium productivity(Between 13599.38-17668.12)	50	62.50	45	56.25
High productivity(Above 17668.12)	16	20.00	0	0.00
Total	80	100.00	80	100.00
Mean	15633.75		10875.00	
S.D	2034.37		939.37	
C.V	13.01		8.63	

t value=2.23 is significant at 0.05 level

Table 4. Distribution of respondents according to productivity (kg/ha) of rapeseed

Category(score range)	(n=160)			
	Participant farmers		Non-participant farmers	
	Number	%	Number	%
Low productivity(Upto 689.18)	13	16.25	54	67.50
Medium productivity(Between 689.18-1056.82)	45	56.25	26	32.50
High productivity(Above 1056.82)	22	27.50	0	0.00
Total	80	100.00	80	100.00
Mean	873.00		603.75	
S.D	183.82		42.15	
C.V	21.05		6.98	

t value=2.28 is significant at 0.05 level

3.3 Impact on the Productivity of Rapeseed

It is evident from Table 4 that the majority of the participant farmers (56.25%) had a medium level of productivity of rapeseed crop followed by 27.50% with a high level of productivity. Only 16.25% of the participant farmers had a low level of productivity of rapeseed crop.

The coefficient of variation (21.05%) indicated that the participant farmer respondents were relatively homogenous concerning their level of rapeseed productivity.

Majority of the non-participant's farmers (67.50%) had low level of productivity of

rapeseed crop followed by 32.50% with a medium level of productivity. None of the non-participant farmers was found with high level of productivity of rapeseed crop.

The coefficient of variation (6.98%) indicated that the non-participant farmer respondents were relatively homogenous concerning their level of rapeseed productivity.

The mean rapeseed productivity score of participant farmers (873.00 kg/ha) was higher than that of the non-participant farmers (603.75 kg/ha). The difference between the mean level of productivity of participant and non-participant farmers were 269.25 kg/ha. The significance of

the difference between the two sample means was tested by employing t-test. The 't' value was found to be significant at the 0.05 level. Hence the corresponding null hypothesis stating that there was no difference between the mean level of rapeseed productivity of participant and non-participant farmers was rejected. Findings, therefore, indicated that the project interventions had a significant positive impact on the level of productivity of rapeseed crop by the participant farmers.

Findings implied that productivity of three selected crops (rice, potato and rapeseed) by the NICRA participant farmers was higher than the non-participant farmers. This might be due to the higher extent of adoption of climate-resilient agro-technologies by the participant farmers whereas the extent of adoption of climate-resilient agro-technologies by the non-participant farmers was very low. It is worth mentioning that participant farmers followed mulching and irrigation in the cultivation of potato and rapeseed crops from the harvested rainwater in the farm ponds leading to higher productivity of those crops than the non-participant farmers. Findings thus implied that NICRA Project interventions could exert a positive impact on the crop productivity of the participant farmers.

4. CONCLUSION

The study concluded that interventions of the NICRA Project had significant positive impact on the farm income of the participant farmers. The mean annual farm income score of participant farmers (Rs. 115969.62) was much higher than that of the non-participant farmers (Rs. 79180.25). It also implied that NICRA Project interventions could exert a positive impact on the crop productivity of the participant farmers. The mean rice productivity score of participant farmers (3177.37 kg/ha) was higher than that of the non-participant farmers (2296.72 kg/ha). It was also evident that the mean productivity score potato of participant farmers (15633.75 kg/ha) was higher than that of the non-participant farmers (10875.00 kg/ha). In case of rapeseed also the mean productivity score of participant

farmers (873.00 kg/ha) was higher than that of the non-participant farmers (603.75 kg/ha).

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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