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Relationship between profile of beneficiaries of national agricultural innovation project and its impact on beneficiaries

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Abstract

Considering the importance of sustainable livelihood in India and availed benefits to the beneficiaries under the NAIP, the present study entitled “Impact of National Agricultural Innovation Project on its beneficiaries in Marathwada Region of Maharashtra.” The present study was conducted purposively in Aurangabad district of Marathwada region of Maharashtra state during the year 2018-19, two tehsils from Aurangabad district i.e. Khultabad and Kannad were purposively selected for the present study in which NAIP project was implemented by KVK, Aurangabad.

It was revealed from the study that, Farming experience (0.278), Sources of irrigation (0.225), occupation (0.251) were found positive and significant relationship with NAIP. Also Innovativeness (0.744), Annual income (0.707), Risk preference (0.588), Source of information (0.757), Market orientation, Economic motivation, Training received was found to have positive and highly significant relationship with impact of NAIP. It was found that non- significant relationship between age (0.063), education, Land holding (0.090) of beneficiaries and impact of NAIP. It was found that co-efficient of determination (R^2) of the independent variables was 0.714. Path analysis study found that, among the profile of NAIP beneficiaries the highest positive total effect on overall impact of NAIP on its beneficiaries was exerted by risk preference, followed by annual income and sources of information. It means that total of the direct effect and indirect effect exerted by all independent variables on overall impact of NAIP.

Keywords: NAIP, Relationship between beneficiaries and NAIP, statistical tools, regression, path analysis etc.

Introduction

Technological explosion in India is taking place at a faster rate in the area of agriculture and allied fields. It is widely accepted that Agriculture sector growth is essential in achieving India's development goals. The sector currently accounts for 14 percent of national GDP and is a source of livelihood for more than half of the population. More than two thirds of the country's poor live in rural areas, and their chance of getting out of poverty directly depends on the performance of agriculture and allied rural sectors. The success of ongoing massive rural development aiming enhanced agriculture productivity and value chains for agricultural products and off-farm job creation in rural areas, which would temper down current massive migrations to urban areas. The agriculture sector also has a major potential for creating rural employment and alleviation of poverty. In the development of farming activities, socio-economic considerations, in addition to sustainability and equity, are necessary. Funding should be identified and committed to ensure long-term sustainability for the various developmental phases, from research, to sustainability of farming, to fishery, to trade and economic analyses, and to training, monitoring and enforcement. Hence, the National Agricultural Policy and the Tenth Five-Year Plan have placed high priority on raising agricultural productivity as a means to achieving rapid agricultural growth and reducing rural poverty. The National Agricultural Innovation Project (NAIP), effective since September 18, 2006, and with an extension of 18 months, it concluded on June 30, 2014. It was the initiative of the Indian Council of Agricultural Research (ICAR), funded jointly by the Government of India and the World Bank to broadly identify and promote technological innovations in agriculture sector. In India, NAIP contributes to the sustainable transformation of Indian agricultural sector to more of a market orientation to relieve poverty and improve income. The NAIP has four research Components out of one is 'Research on Sustainable Rural Livelihood Security' (SRLS).

NAIP Component 3- is subproject which commenced in 2007 in 76 villages of five backward districts of Maharashtra with the objective of developing a holistic solution for promoting sustainable livelihoods. In Component 3, emphasis will be on improving the sustainability of the farming systems and natural resource management in the less-favorable environments. Higher attention will be given to rain fed, hilly and mountainous regions in maharashtra. The sustainability approach involved integrated cluster development comprising of interventions that focused on: improved agriculture methods, livestock development, water resource development, Empowerment through capacity building and skill development of stakeholders including men and women farmers. Promotion of agricultural and economic development in developing countries has been the biggest challenge in this twenty first century. One such path breaking and fundamental programme in independent India has been rural employment creation through the NAIP (Roy 2018) ^[18].

Therefore, it is important to know different interventions implemented under the study area, status of SRLS due to NAIP interventions. It is necessary to find out the changes that may have occurred in the production, productivity, livelihood, livestock, socio-economic status and problems faced by the beneficiaries. With this background, a study has been conducted to evaluate the impact of National Agricultural Innovation Project interventions on its beneficiaries.

Methodology

The present study was conducted purposively in Aurangabad district of Marathwada region of Maharashtra state during the year 2018-19, two tehsils from Aurangabad district i.e. Khultabad and Kannad was purposively selected for the present study in which NAIP project was implemented by KVK. Further, Two NAIP implemented villages and two non-NAIP villages were purposively selected from each tahsil. Thus, total four NAIP villages and four non-NAIP villages was selected for the present study. The list of beneficiaries of NAIP project (2009-15) was obtained from KVK, Aurangabad. 30 beneficiaries from each village were selected randomly to make a sample of 120 beneficiaries from NAIP implemented villages and 120 non-beneficiaries selected from the nearby villages with same agro ecological situation. Thus, total 240 beneficiaries and non-beneficiaries were selected for present study. Ex-post facto research design was adopted in this study. The data were collected with the help of pretested interview schedule. A survey approach was used for the study. A Likert type scale was prepared to measure the Impact of NAIP on its beneficiaries. Responses were scored on a 5-point continuum ranging from 5 = 'Strongly Agree' to 1 = 'Strongly Disagree'. The respondents were asked to rank the statements as per their view point. The statistical methods and tests such as frequency, percentage, mean, standard deviation, co-efficient of correlation and Z test were used for the analysis of data.

Results and Discussion

Correlation analysis

In relational analysis, it was observed that the independents variables namely, occupation, annual income, risk preference, innovativeness, sources of information, market orientation, economic motivation, training received were positively and significantly related with impact of National Agricultural

Innovation Project. The variable namely age, education, land holding and family size were unable to establish any relationship with the impact of National Agricultural Innovation Project.

Table 1: Correlation analysis between profiles of the beneficiaries with overall impact of National Agricultural Innovation Project

Sr. No.	Independent Variables	Correlation coefficient (r)
1	Age	0.063 ^{NS}
2	Education	-0.073 ^{NS}
3	Family size	-0.228*
4	Land holding	0.090 ^{NS}
5	Farming experience	0.278**
6	Occupation	0.251*
7	Source of irrigation	0.225*
8	Annual income	0.707**
9	Risk preference	0.588**
10	Innovativeness	0.744**
11	Sources of Information	0.757**
12	Market orientation	0.341**
13	Economic motivation	0.521**
14	Training received	0.782**

* Significant at 0.05 level of probability ** Significant at 0.01 level of probability

1.1 Age with Impact of National Agricultural Innovation Project

Table No. 1 revealed that, there was non- significant (0.063) relationship between age of beneficiaries and impact of National Agricultural Innovation Project

It means that increasing age of NAIP beneficiaries will not help in increase in the impact of NAIP on its beneficiaries. There was no any relationship of age with impact of NAIP.

1.2 Education with Impact of National Agricultural Innovation Project

Table No. 1 showed that, education could not establish any relationship with the National Agricultural Innovation Project. The illiterate farmer can also be able to understand NAIP interventions such as training programmes, farm mechanization activities, use of farm implements as the NAIP scientist had demonstrations in local language to their family members also. Hence, education was not able to establish any relationship with National Agricultural Innovation Project.

1.3 Family size with Impact National Agricultural Innovation Project

From above table No. 1 it was revealed that, family size was negatively significant with National Agricultural Innovation Project.

It means that, as the family size increases the impact of National Agricultural Innovation Project decreases. The relation interprets that, bigger the family size less is the impact of NAIP. More members in the family may create conflicts about the various decisions making and hence creates confusion about the services delivered to them causes less impact.

1.4 Land holding with Impact of National Agricultural Innovation Project

Land holding was found non- significant (0.090) with impact of National Agricultural Innovation Project.

Many of the beneficiaries were landless and marginal farmers under NAIP. Different interventions were planned to landless,

marginal landholdings, farm women etc. Because of which there was no significant relationship found between land holding and National Agricultural Innovation Project.

1.5 Farming experience with Impact of National Agricultural Innovation Project

Farming experience of the beneficiaries was found positive and significant (0.278) relationship with knowledge.

It means that more the experience in farming more the impact of NAIP on them. It also indicates that increase in farm experience, increased the level of knowledge of NAIP beneficiaries, due to which there was positive and significant relation between farm experience and impact.

1.6 Sources of irrigation with Impact of National Agricultural Innovation Project

Table No. 1. Revealed that, there was positive and significant (0.225) relationship between sources of irrigation and impact of National Agricultural Innovation Project.

Increase in sources of irrigation among the NAIP beneficiaries which helped to increase the impact of National Agricultural Innovation Project on its beneficiaries.

1.7 Occupation with Impact of National Agricultural Innovation Project

There was positive and significant (0.251) relationship between occupation and impact of National Agricultural Innovation Project.

It may due to increase in net income from various occupations of NAIP beneficiaries there was increase in impact of NAIP. NAIP beneficiaries with farming had adopted more subsidiary enterprises and obtain more income from different occupations like such as poultry, goatery etc. as compared to non- beneficiaries.

1.8 Annual income with Impact of National Agricultural Innovation Project

Annual income had shown positive and significant (0.707) relationship with impact of NAIP.

It means that with increase in annual income of NAIP beneficiaries there was increase in impact of NAIP. Annual income provides the economic base for NAIP beneficiaries and increases their risk orientation and make them more capable to procure inputs for the adoption of different farming practices and subsidiary occupation. Annual income help to increase the living standard, thus annual income has positive relationship with impact of NAIP.

1.9 Risk preference with Impact of National Agricultural Innovation Project

Risk preference of the beneficiaries was found to have positive and highly significant (0.588) relationship with impact of NAIP.

The probable reason could be that the farmers with more risk preference prone to take risk and face the challenges to get maximum returns due to which risk preference has positive relationship with impact of NAIP.

1.10 Innovativeness with Impact of National Agricultural Innovation Project

Innovativeness of the beneficiaries was found to have positive and highly significant (0.744) relationship with impact of

NAIP.

Innovativeness is able to do new things. NAIP beneficiaries were more innovative because NAIP had given the technical knowledge about cultivation practices, farm mechanization and introduce them with new occupations.

The findings of the study are similar to that of Kambale *et al.* (2002) and Pise (2017).

1.11 Source of information with Impact of National Agricultural Innovation Project

Table 36 revealed that, there was positive and highly significant (0.757) relationship between source of information of impact of NAIP.

Beneficiaries of NAIP gain variety of exposure and more amount of knowledge if he or she has an opportunity to expose with more number of sources of information Therefore, use of sources of information might establish positive and significant relationship with impact of NAIP.

1.12 Market orientation with Impact of National Agricultural Innovation Project

Market orientation was found positive and highly significant with impact of NAIP.

It interprets that as market orientation increases impact of NAIP increases as the farmers get the market intelligence by different trainings and field demonstrations and that help them to get good prices. Market orientation also provides farmers an opportunity to select their cropping pattern according to market in order to get more profit.

1.13 Economic motivation with Impact of National Agricultural Innovation Project

Positive and highly significant (0.521) relationship between economic motivation of NAIP beneficiaries and impact of NAIP was seen from table no. 36

It means that increasing economic motivation of the NAIP beneficiaries will helps in increase in the impact of NAIP on its beneficiaries. Economic motivation is a composite variable which can be achieved with ample resources provided by NAIP.

1.14 Training received

Table 36 revealed that, there was positive and highly significant (0.782) relationship between training received impact of NAIP.

It could be concluded that institutional training received by the members of NAIP had created positive impact on them. Training might have helped to improve knowledge and skills of the individuals in their respective enterprises, which might have helped them to perform selected enterprises effectively. This in turn, might have helped them earn more and thereby, elevate their socio-economic conditions, thus training received has positive relationship with impact of NAIP.

1.2. Multiple regression analysis between profile of the beneficiaries with overall impact of NAIP

Multiple regression analysis showed that occupation, source of irrigation, annual income, risk preference, innovativeness, market orientation, economic motivation and training received were contributor for attaining variation in the impact of National Agricultural Innovation Project.

Table 2: Multiple regression analysis between profile of the beneficiaries with overall impact of National Agricultural Innovation Project

Sr. No.	Independent Variables	Regression coefficient (Bi)	Standard Error (S.E)	't' value
1.	Age	0.0221	0.1761	0.125 ^{NS}
2.	Farming experience	0.2952	0.2440	1.210 ^{NS}
3.	Education	-0.3586	0.3982	-0.901 ^{NS}
4.	Family size	-0.8885	0.4744	-1.873 ^{NS}
5.	Land holding	0.8680	0.4565	1.901 ^{NS}
6.	Occupation	0.8940	0.2941	3.040**
7.	Source of irrigation	0.9603	0.4345	2.210*
8.	Annual income	0.0000	0.0000	2.663**
9.	Risk preference	1.3652	0.2500	5.460**
10.	Innovativeness	0.4540	0.1277	3.554**
11.	Sources of Information	0.2233	0.2366	0.944 ^{NS}
12.	Market orientation	1.1589	0.3488	3.323**
13.	Economic motivation	0.5554	0.1632	3.403**
14.	Training received	0.9824	0.4912	2.102*

The overall contribution of all the selected independent variables in impact of National Agricultural Innovation Project was found 71.42 per cent.

It could be observed from Table 2 that co-efficient of determination (R^2) of the independent variables was 0.714. It means that 71.40 per cent of total variation in the impact of NAIP on its beneficiaries was explained by the selected 14 independent variables. The unexplained variation may be due to the factors outside the scope of the study.

The value of 't' showed that impact of NAIP was significantly related with occupation, source of irrigation, annual income, risk preference, innovativeness, market orientation, economic motivation and training received.

The regression coefficients of these variables were 0.022, 0.295, -0.358, -0.888, 0.868 and 0.223 respectively which indicates that one unit change in the variables viz., age, education, Farming experience, family size, land holding and sources of information would affect 0.022, 0.295, -0.358, -0.888, 0.868 and 0.223 unit change in impact of NAIP. Hence, eight variables were found most important variables in exercising influence on impact of NAIP on its beneficiaries.

1.3 Path analysis showing the effect of profile of independent variables on the beneficiaries on their overall impact of NAIP

Table 3: Path analysis showing the effect of profile of independent variables on the beneficiaries on their overall impact of NAIP

Sr. No.	Independent variables	TE	DE	TIE	SIE	
					1	2
X1	Age	0.0386	0.8887	0.9273	0.0375 (X8)	0.0374 (X2)
X2	Farming experience	-0.0238	0.9475	0.9237	0.002 (X3)	-0.0029 (X6)
X3	Education	-0.0058	-0.0679	-0.0737	0.0012 (X6)	0.0008 (X13)
X4	Family size	-0.1278	0.7061	0.5783	-0.0003 (X6)	-0.0059 (X3)
X5	Land holding	-0.0915	0.7383	0.6468	-0.0028 (X3)	-0.0031 (X6)
X6	Occupation	-0.022	0.1052	0.0832	0.0045 (X3)	0.0034 (X7)
X7	Source of irrigation	0.0102	0.215	0.2252	0.0028 (X3)	0.0022 (X8 & X9)
X8	Annual income	0.2763	0.6309	0.9072	0.2686 (X1)	0.2654 (X2)
X9	Risk preference	0.6184	0.3703	0.9887	0.5982 (X12)	0.5942 (X11)
X10	Innovativeness	-0.0667	0.8114	0.7447	0.0021 (X3)	-0.0055 (X6)
X11	Sources of Information	0.2694	0.6878	0.9572	0.2588 (X9)	0.2586 (X1)
X12	Market orientation	0.1097	0.8478	0.9575	0.1061 (X9)	0.1050 (X11)
X13	Economic motivation	-0.0734	0.995	0.9216	0.0104 (X3)	-0.0093 (X7)
X14	Training received	0.003	0.1799	0.1829	0.0007 (X3)	0.0006 (X1)

3.1 Total effect

It was observed from Table 3 that, among the profile of NAIP beneficiaries the highest positive total effect on overall impact of NAIP on its beneficiaries was exerted by risk preference, followed by annual income and sources of information. It means that total of the direct effect and indirect effect exerted by all independent variables on overall impact of NAIP.

3.2 Direct effect

It was also noticed that, the highest direct positive influence on overall impact of NAIP on its beneficiaries was exerted by economic motivation followed by farming experience market orientation, innovativeness, land holding and annual income on impact of NAIP on its beneficiaries. It means that

association of one independent variables i.e. risk preference with other independent variables of the indirect paths specified in the model.

3.3 Total indirect effect

It is further seen that overall impact of NAIP on its beneficiaries, the highest positive total indirect effect was exerted by risk preference followed by market orientation, economic motivation, sources of information, innovativeness and land holding. Total indirect effect means association of one independent variable i.e. risk preference and market orientation with other mediated through other variable in the model. It computed as the product of paths linking variables.

3.4 Substantial indirect effect

As regards the substantial indirect effects on overall impact of NAIP on its beneficiaries, the results shows that the first substantial indirect effect on was exerted by risk preference followed by annual income and sources of information. The data in the results further shows that highest second substantial indirect effect on overall impact of NAIP was exerted by risk preference followed by annual income and sources of information.

Thus, it is observed that risk preference, annual income, market orientation, economic motivation and sources of information were the important variables in absence of which, independent variables are not able to influence the impact of NAIP on its beneficiaries.

Conclusions

It was revealed from the study that, Farming experience (0.278), Sources of irrigation (0.225), occupation (0.251) were found positive and significant relationship with NAIP. Also Innovativeness (0.744), Annual income (0.707), Risk preference (0.588), Source of information (0.757), Market orientation, Economic motivation, Training received was found to have positive and highly significant relationship with impact of NAIP. It was concluded that, among the profile of NAIP beneficiaries the highest positive total effect on overall impact of NAIP on its beneficiaries was exerted by risk preference, followed by annual income and sources of information. It means that total of the direct effect and indirect effect exerted by all independent variables on overall impact of NAIP. Understanding the sustainable rural livelihood security of farmers of undeveloped areas through NAIP interventions with a multidimensional approach which would be a useful tool for the researchers and policy makers and extension workers at various levels to assess and compare the status of livelihood security of farmers in the country.

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