

A Study on Impact of Literacy of Farmers During the Purchase of Agricultural Inputs

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Abstract: Farmers are playing a vital role in contributing to the Indian economy. But now-a-days the situation has changed as the performance and productivity of farmers gone down than expected (i.e.) due to lack of awareness and knowledge on modern agricultural farming methods and technology. It is well known that most of the farmers in India are illiterates, unable to compete with the present changing environment which leads to less productivity. Due to illiteracy farmers are unable to identify whether the seeds are original or spurious and also to analyse the market position of particular agri-inputs (i.e.) seed. The government is providing various schemes and subsidies to farmers but only a few people who are educated were making use of them. So, the objective of this study is to find out that is there any relationship between literacy of farmers and purchase decision of farmers in buying agricultural inputs (i.e.) seed. Sample taken for study is from Nallapadu Village, Guntur Andhra Pradesh, India with 200 sample size. Kruskal's Gamma Method is used for result analysis. Study resulted that there is relation between literacy of farmers and purchase decision of farmers while buying agri-inputs (i.e.) seed.

Key words: Literacy, productivity, Kruskal's Gamma, agri-inputs, farmers

INTRODUCTION

Agriculture plays a vital role in Indian economy. About 65% of Indian population depends on agriculture and allied sectors. Agriculture accounts for around 13.6% of GDP and also provides about 54.6% employment to people in India. Agriculture originates its significance from the fact that it has crucial demand and supply links with the manufacturing sector. Over the past few years, Indian agriculture sector has endorsed stunning improvements in the production of commercial crops, fruits and vegetables, oilseeds, poultry, aqua culture, food grains, pisciculture and dairy. India is the second largest producer of fruits and vegetables and the largest producer of milk in the world in addition to being the largest overseas exporter of cashew nuts and spices.

Progress of a country's agriculture depends on millions of farmers who shall keep pace with the changing technology. In rural India, the decision-making process passes through a series of "Ifs and Buts" before arriving at decisions. Farmers of today need to take decisions about the inputs they use the type of crop they grow, the market they sell their produce and so on. Farmers consider a number of factors before arriving at any decision

regarding farm and non-farm activities because the present decision reflects upon the future actions. Farmers consider economic status of the family to take decisions in the area of marriage and education, financial management as this will influence the type of investment they make and also the image of the family in the eyes of the society. In non-farm decision making farmers consider nature of the situation as this will help in searching relevant alternatives to find solution to the problems.

In India most of the farmers are illiterates, unable to compete with the changing technological environment and are not in a position to identify whether the pesticides, seeds are original or duplicate due to lack of awareness about the ingredients mixed in them. Their knowledge to analyze the market opinion on particular inputs or products is also very limited. The government is providing schemes and subsidies to farmers but only a few farmers are making use of these subsidies. Keeping this in view the present study is undertaken to know the impact of literacy on farmer's decision making process in purchasing agricultural inputs. The reason for undertaking the study is to assess need for literacy to farmers and to suggest importance of education to farmers for improving productivity in taking better purchase decisions.

Agriculture sector in India: Agriculture is the dominant sector in India, around 65% of the total population still relies on agriculture for employment. After the green revolution, India has been transformed from a food deficient stage to a surplus food market stage. In a period of three decades, India became a net exporter of food grains. Amazing results were achieved in the fields of oil seeds and dairy through white and yellow revolutions. But, the sector however could not maintain its growth momentum in the post green revolution years. The deliberate growth in agriculture and the accelerated growth in industry reversed the structure of national GDP of Indian economy. Notwithstanding with these major structural transformations, the agriculture sector continued to accommodate the majority of the workforce. There are many fluctuations in output even after improved technology and input facilities like Irrigation, high yielding seeds, advancements in cropping pattern, advanced machinery, etc. India is still emerging as a significant trade partner in the world's agricultural market as it holds around 1% of the total global trade in agricultural commodities. With the successful trade negotiations under the WTO, Indian Agriculture needs to remake its outlook and strengthen competitiveness to continue growth from the demand side. With India being a major negotiator in the world agriculture trade, it can be expected that the Indian agriculture trade will widen in the years to come. This was started with India signing the Agreement on Agriculture (AOA) during the Uruguay Round.

Indian agriculture is now witnessing a phase of diversification shifting from traditional crops to high-value crops. The competitive advantages of Indian agriculture are: favourable agro-climatic conditions, large irrigated lands, availability of skilled and educated manpower and decreasing gap between present productivity and potential productivity. To grasp the global competitive advantage, Indian agriculture needs intercession in the areas of policy, advanced technology and also market access.

In Fig. 1, we can observe that the contribution to GDP has been declining in 2012-13 (i.e., 13.7%) when compared to 2011-12 (i.e., 15%). This is due to a shift from agriculture to industry and service sectors. As per the latest estimates released by Central Statistics Office (CSO) in 1950-51 the share of agricultural products and allied Sectors in Gross Domestic Product (GDP) of the country was 51.9% which dropped to 13.7% in 2012-13.

Literature review: Education is a human right and of paramount importance for economic and social progress. Understanding this importance of education,

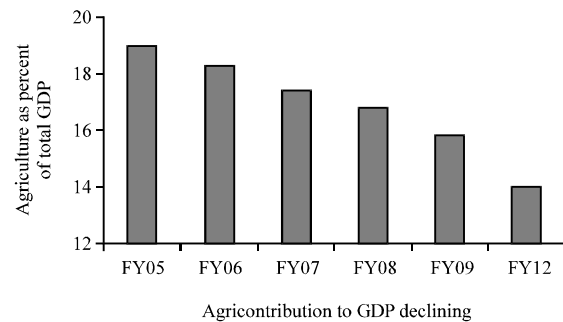


Fig. 1: Agricultural contribution to GDP In India (central statistics office)

the recognition of educational expansion has been increasing worldwide (Hansen, 2001). It is unclear to farmers about the effects of education on their agricultural activities. So, the need for education to use scientific method of agriculture is felt necessary as appropriate use of inputs is not well registered by the farmers due to illiteracy or low level of education. Education enhances farm productivity by increasing the capacity to adjust to fluctuations and improving labour efficiency. Education not only induces growth, it also improves individual productivity. Now-a-days the technology has been advancing day by day and a suitable response to changes in technology in the field of agriculture needs the collection and processing of new information and only educated farmers readily respond than others (Alene, 2002). So, education has become more important to understand the changes in the farming methods. A farmer is expected to adapt according to the changing technological or economic environment (Schultz, 1964). As the farming methods in India are traditional it is relevant for Indian farm households to invest in education. In a village or in a region all the farmers use same technology and the effects of conventional and non-conventional inputs on agricultural productivity are independent of technology adoption status (Jamison and Mook, 1984).

After green revolution, Indian farmers are adopting modern inputs such as high yielding varieties of seeds, modern machinery, pesticides and fertilizers to enhance the output. Technological innovations are also spreading widely in the country and India has been the highest producer of farm machinery, i.e., tractors in the world. Education may have both cognitive and non-cognitive effects upon labour productivity. Increase in literacy helps farmers to understand and to calculate the input quantities required for a field of hectare. Education helps to build personality, positive attitude and beliefs which help farmers to take risks by adopting innovations

(Appleton and Balihuta, 1996). Education increases access to information from external sources and also enhances the ability to acquire knowledge relating to new technology. Schooling enables farmers to learn on the job and of the job skills more efficiently (Rosenzweig, 1995). These skills reduce technical and allocative efficiencies resulting in increased productivity. Education enables farmers to deal with credit agencies efficiently as they can able to understand and can keep records of financial transaction done.

Inputs like land, labour, capital, water availability, electricity, seeds, fertilizer, pesticides, input-output price differential, weather conditions, shows significant influence on agricultural productivity (Yasmeen *et al.*, 2011). Farmers need various types of information for farming and they use a number sources such as media, community information centers, NGO information centers and from other government information centers to get access of their required information but their skills in using modern techniques in agriculture are not at a satisfactory level. So, adult literacy program is required to help the farmers acquiring basic skills and abilities to seek and receive needed agricultural information through modern communication channels (Akanda and Roknuzzaman, 2012). Education and experience of the effective head of the household improves the cost efficiency of farming (Mohapatra, 2009) as the farm efficiency primarily depends on education of the household, who makes all the decisions.

MATERIALS AND METHODS

The methodology includes research publications, surveys, interviews, other research techniques and also consists of both present and historical information.

Population of the study: The population has been selected from Nallapadu village as it is nearer to Guntur City Andhra Pradesh, India as the Guntur being known for commercial crops and exporting of agro-products worldwide. Nallapadu village is characterised by the presence of cold storages. Major crops grown are chillies and cotton and the exports of these crops require the farmers to be educated to understand the dynamic practices in exporting.

Sources of data collection: The primary data were collected from farmers through schedules and the secondary data were collected from various published and unpublished articles, reports, etc.

Sample size and area: The sample chosen here is random sample with sample size of 200 respondents and the sampling area taken is Nallapadu village near by Guntur City in Guntur District Andhra Pradesh, India.

Research problem: Productivity of farmers is decreasing day by day due to lack of knowledge on modern cultivation methods and by usage of spurious inputs due to illiteracy of farmers. So, this study was undertaken to find out “whether there is any relationship between literacy of farmers and purchase decision of agricultural inputs for farming and also to find the impact of education on farmers”.

Importance: The topic deals with the present status of the Indian farmers as most of the farmers are illiterate and the importance of this topic is to find out whether there is any impact of literacy on farmers during the purchase of agriculture inputs and productivity. If the farmers are educated they would know the relevant information regarding agro inputs as to what to buy, how to buy, where to buy and when to buy the agro inputs. Advantages if the farmers are literates:

- Easy adoption of technological changes in agriculture
- Selection of best quality raw material
- Easy identification of the opportunities
- Effective purchase decisions
- Economies of scale

Scope of the study: The study focussed on farmers in Nallapadu Village, nearer to Guntur city Andhra Pradesh, India. Scope of the study is pertaining to the impact of literacy on farmers with respect to purchase of agricultural inputs like seeds, fertilisers and pesticides, changing agriculture technologies and new methods of cultivation and irrigation. Today in the light of changes in technology and adaptation of new methods of cultivation and irrigation, there is a need for farmer to be literate. Guntur being known for commercial crops and exporting of agro-outputs worldwide, researcher felt that the farmers should become literates to take the advantage of market opportunities. Nallapadu Village is in Guntur District and nearer to Guntur City and was characterised by presence of cold storages. Commercial agro product exports require the farmers to be up-to-date to understand the changing dynamics of agriculture practices. This study intends to reveal the impact of literacy of farmers while buying agro-inputs. But generalizing the results to macro level may not be relevant.

Objectives of the study: The objectives of the study are:

- To find out whether there is any relationship between literacy of farmers and decision making process of farmers in purchasing agricultural products
- To assess the need for literacy of farmers in adapting new technological agro based inputs for cultivation

Hypothesis:

- H_0 : there is no relationship between literacy of farmers and decision making process of farmers in purchase of agricultural products
- H_1 : there is relationship between literacy of farmers and decision making process of farmers in purchase of agricultural products

Statistical tool used for the study: To find the relationship between ordinal variables there are different methods like Non-Parametric Measures of Correlation, Spearman's Rho, Kruskal's Gamma, Kendall's tau Methods. The variables taken are ordinal level variables. The statistical method used for the study is Kruskal's Gamma Method to measures the strength of association between the variables.

Goodman and Kruskal's Gamma measures rank correlation. When both variables are measured at the ordinal level it measures the strength of association of the cross tabulated data. Value ranges from -1 (100% negative association or perfect inversion) to +1 (100% positive association or perfect agreement) and a value of zero indicates that there is no association between the variables. Calculation of Kruskal's Gamma:

$$G = \frac{N_s - N_d}{N_s + N_d}$$

Where:

N_s = The number of pairs of cases ranked in the same order on both variables (number of concordant pairs)

N_d = The number of pairs of cases ranked differently on the variables (number of discordant pairs)

- If $G = 0$ there is no association between variables (no relationship between two variables)
- If $G = 1$ there is positive association between variables (perfect positive relationship between two variables)
- If $G = -1$ there is negative association between variables (perfect negative relationship between two variables)

This statistical tool can be regarded as the maximum likelihood estimator for the theoretical quantity γ where:

$$\gamma = \frac{P_s - P_d}{P_s + P_d}$$

where, P_s and P_d are the probabilities that a randomly selected pair of observations will place in the same or opposite order, respectively when ranked by both variables.

Critical values for the gamma statistic are sometimes found by using an approximation, whereby a transformed value, t of the statistics is referred to student t distribution where:

$$t \approx G \sqrt{\frac{N_s + N_d}{n(1 - G^2)}}$$

and where n is the number of observations (not the number of pairs):

$$n \neq N_s | N_d$$

RESULTS

The data were collected from 200 farmers in Nallapadu Village who are having different education levels and has expressed their opinions differently. Education levels of farmers are taken as illiterate, primary education, secondary education, graduation and post graduation (Table 1).

Of the 200 farmers 67 (33.50%) are illiterates, 60 (30%) are having primary education, 48 (24%) are having secondary education and 25 (12.50%) are graduates.

Out of 200 respondents 61.5% answered yes for >50% of questions relating to whether there is any relationship between literacy of farmers and purchase decision making of farmers on agriculture inputs. While 19% of respondents answered 'no' for >50% questions, 19.5% of respondents said that they "cannot say" (Table 2).

Table 1: Education of farmers

Parameters	Education			
	Illiterate	Primary education	Secondary education	Graduation/PG
Count	67.0	60.0	48.0	25.0
Row N (%)	33.5	30.0	24.0	12.5

Table 2: Response of farmers

Parameters	Response		
	Yes	Cannot say	No
Count	123.0	38.0	39.0
Row N (%)	61.5	19.0	19.5

Yes: responded 'yes' for >50% questions; no: responded 'no' for >50% questions; cannot say: responded 'cannot say' for >50% questions

Table 3: Response of Illiterate farmers

	Response		
	Yes	Cannot say	No
Illiterates	48	7	12

Table 4: Response of primary educated farmers

	Response		
	Yes	Can not say	No
Primary	33	12	15

Table 5: Response of secondary educated farmers

	Response		
	Yes	Can not say	No
Secondary	28	11	9

Table 6: Response of graduate/PG farmers

	Response		
	Yes	Cannot say	No
Graduation/pg	14	8	3

Table 7: Missing values

	Cases					
	Valid		Missing		Total	
Case	N	%	N	%	N	%
processing summary						
Education* response	200	100.0	0	0.0	200	100.0

Table 8: Cross tabulation

Education* response crosstabulation (count)	Response			Total
	Yes	Cannot say	No	
Education				
Illiterate	48	7	12	67
Primary education	33	12	15	60
Secondary education	28	11	9	48
Graduation/PG	14	8	3	25
Total	123	38	39	200

Out of 67 illiterate farmers 48 responded 'yes', 7 farmers responded 'cannot say', 12 farmers responded 'no' (Table 3). Out of 60 primary educated farmers, 33 responded 'yes', 12 farmers responded 'cannot say', 15 farmers responded 'no' (Table 4).

Out of 48 secondary educated farmers, 28 responded 'yes'. While, 11 farmers responded 'can not say', 9 farmers responded 'no' (Table 5). Out of 25 graduate farmers 14 responded 'yes'. Whereas, 8 farmers responded 'cannot say', 3 farmers responded 'no' (Table 6) Case processing summary is given in Table 7.

From Table 8, out of 67 literate farmers 48 farmers responded 'yes', 7 farmers responded 'cannot say' and 12 farmers responded 'no'. Total of 60 farmers who have primary education, 33 farmers responded 'yes', 12 farmers responded 'cannot say' and 15 farmers responded 'no'.

Out of 48 farmers who have secondary education 28 responded 'yes', 11 farmers responded 'cannot say' and

Table 9: Symmetric measures

Parameters	Value	Asymp.	Approx.	Approx.
		SE ^a	T ^b	Sig.
Ordinal by ordinal gamma	0.113	0.094	1.207	0.228
N of valid cases	200			

^aNot assuming the null hypothesis and ^bUsing the asymptotic standard error assuming the null hypothesis

9 farmers responded 'no'. Out of 25 farmers who did graduation/PG, 14 responded 'yes', 8 farmers responded 'cannot say' and 3 farmers responded 'cannot say'.

The statistical tool taken for analysis is Kruskal's Gamma Method. Gamma value is 0.113 which is a positive value. From that we can conclude that there exists a relationship between literacy of farmers and purchase decision making of farmers on agriculture inputs. From the gamma value the null hypothesis was rejected and alternative hypothesis was accepted, i.e., H₁: there is relationship between literacy offarmers and decision making process of farmers to purchase agricultural products (Table 9).

DISCUSSION

Farmer's repeatedly purchase agricultural inputs likeseeds, pesticides, fertilizers, modern farming products, farming equipment's. So, it is important for a farmer to be literate as literacy helps farmers to take appropriate decisions while purchasing agriculture inputs. From the analysis, it is observed that majority of the farmers accepted that literacy is important and moreover, 61.5% respondents accepted that there is relationship between literacy of farmers and purchase decision making of farmer on agriculture inputs. It is also observed that merely a good number of farmers are showing interest on education.

CONCLUSION

The study investigated whether there is any relationship between literacy of farmers and their purchase decisions on agriculture inputs. Farmers from Nallapadu village near Guntur have been selected for the study as most of the people were farmers. The study is conducted for creating awareness of education to farmers. The result of the study, i.e., gamma value is 0.113 which is positive value. From that we can conclude that there exists relationship between literacy of farmers and purchase decision of farmers on agriculture inputs. Literacy is one of the factors which influences purchase decision of the farmers. Education helps farmers to take firm purchase decisions like where to buy when to buy what to buy pesticides, fertilizers, modern agriculture products, seeds. Taking firm decisions reduces the input

costs which increases the productivity of farmer. From this study we can conclude that farmers are to be educated.

SUGGESTIONS

- As some farmers felt that literacy is not necessary to take purchase decisions, it is necessary to create awareness to them on literacy
- Government has to take concrete measures for improving the literacy rate of farmers

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