Agro Economist - An International Journal
Citation: AE: **9**(03): 213-217, September 2022
DOI: 10.30954/2394-8159.03.2022.4
Peer Reviewed Journal

AAEBM
ASSOCIATION OF AGRICULTURAL ECONOMICS & AGRI-BUSINESS MANAGEMENT

Analysis of Effect in Consumption Pattern Due to Different Education-Level of Beneficiary Farmers Enrolled Under PM-KISAN Scheme in Jammu Region, J&K (U.T.)

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Received: 27-04-2022 **Revised:** 19-07-2022 **Accepted:** 25-08-2022

ABSTRACT

PM-KISAN Samman Nidhi is a scheme sponsored by union government of India, through which each farmer are provided with ₹ 6000 annually in three instalments of ₹ 2000. In Jammu district, total of 95950 farmers have been registered under the scheme, till financial year 2020-21. This paper analyses the change in consumption pattern of those in relation to their education-level falling the category such as illiterate, primary, secondary or above. The change in consumption of agricultural inputs were seen more prominent in the farmers who had secondary or above level of education. The impact of the education for utilization of funds under the scheme was realised to be an important factor and thus it could be concluded that promotion of education for better utilization of funds under the scheme is necessary.

Keywords*:* PM-KISAN, Funds, Inputs, Utilization, Education.

Agriculture sector is considered to be the backbone sector of Indian economy. Not just because of the reason that it provide approximately 54 per cent of its population with jobs but also because it provides raw materials for the sectors. Whether it may be industrial sector for raw materials or food grains to feed its population. But since recent few years, agriculture sector has failed to attract the masses as an occupation. This could be cited due to various reasons but the most basic one remains, its low return on investment. Indian farmers are commonly marginal farmers owning less than one hectare of land. Mostly, an Indian farmer borrows money or invests his personal saving for inputs such as seeds, fertilizers, chemicals, etc. and waits for the harvest to fulfil his needs sometimes even the basic ones. But mostly after harvest, farmer is not able to get their full returns as they are not able to sell their produce even at the cost of cultivation for the crop. This is due to abundant supply of produce in the end of cropping reason (particularly in case of paddy cultivators). This results creates a situation

How to cite this article: Verma, A., Singh, S.P., Dwivedi, S., Sharma, P., Singh, K. and Kaur, R. (2022). Analysis of Effect in Consumption Pattern Due to Different Education-Level of Beneficiary Farmers Enrolled Under PM-KISAN Scheme in Jammu Region, J&K (U.T.). *Agro Economist - An International Journal*, **09**(03): 213-217.

Source of Support: None; **Conflict of Interest:** None

of cash crunch for them, and especially marginal farmers suffer due to this. Economically, we can term this situation as "Liquidity Constraint" of a farmer who is not able to sell his crop due to the fear of losses he might incur and thus retain his produce in the form of an asset. This might lead him to either compensate his demand through borrowing cash or by reducing consumption level. Most farmers consider borrowing as their last resort and hence try to reduce their consumption. Reduction in consumption leads to reduction in investment for an economy. In other words, we can say that if people reduce their consumption for consumer and capital goods; then it is obvious that industries will reduce their investment capital for producing them. As the investment in a country reduces this will further led to reduction in the income level of population.

T.W. Schultz (1964) suggested after discussing the importance of the "allocative efficiency of traditional agriculture", that in general, where technically superior factors of production are a principal source of agricultural growth, schooling counts. This attribute of education has previously been suggested as one of the ways in which education enhances market productivity. Nelson and Phelps (1966) suggested that education enhanced one's ability to receive, decode, and understand information. This helps in increasing the demand and consumption of goods and commodity that were advertised at a regular basis. Welch (1970) showed that an important and clear analysis of the productive value of education has been made, and evidence of the "allocative effect" of education in agricultural production has been adduced.

Michael (1972) analyzed that although only this one estimate of the non-market efficiency effect were discussed, the larger monograph includes numerous others. For example, the regression equation was reinstated including only the nine nondurables: food at home, food away from home, tobacco, and alcohol, household operations, personal care, medical care, leisure, and education; and using the constant elasticity form, the value of the coefficient was 0.50. This suggests that the eleventh year of schooling was equivalent to raising the household's level of total expenditure from $5,000 to $5,250. Obviously, these two estimates are considerably different in magnitude and are, at best, rough estimates. The monograph also considers a more detailed expenditure classification of 50 items and imposes certain constraints on the entire system of demand equations. Overall, the results are qualitatively similar to the result reported here—education appears to have a small but persistent positive effect. Michael and Robert (1973) suggested that level of formal schooling directly influences consumer behavior independently of its effect on money income. Second, the results suggest that the effect of education was not a random or erratic one, but was systematically related to the changes in consumption patterns attributable to differences in levels of income. However, the impacts of cash transfers in agriculture sector are comparatively quite less studied including, importantly their impact on technology adoption for cultivation of crops (examples include Sadulet, de Janvry, and Davis 2001; Gertla, Martinez and Rubio-Codina, 2006; Hanshofer and Shapiro, 2016; and Tirivayi, Knowles and Davis, 2016). In this context, PM-KISAN is proposed as a natural experiment to access the effects of cash transfers. For the intervention to have a long-term impacts, there must be investment in activity that are more productive. In this context, Gertler and Martinez (2006) and Rubio-Codina and Handa *et al.* (2018) have shown that small monthly cash transfers may lead to increased consumption even after the beneficiaries left such programme.

Union Government of India launched a new Central Sector Scheme, namely "Pradhan Mantra Kisan Samman Nidhi" (PM-KISAN) in financial year 2019-20. It aims to supplement the financial needs of farmers in procuring various agricultural inputs to ensure proper crop health and yields, commensurate with the anticipated farm income at the end of each crop cycle. But the factor that influence the accomplishment of the objectives are to be determined. In this respect, effect of education-level of farmers for analyzing the change in consumption of agri-inputs need to be tested. This paper attempts to serve this purpose.

Methodology

For selection of beneficiaries, multistage stratified random sampling technique was used. At first stage, a list of villages falling in each block were prepared and 10 villages from block were randomly selected.

At the second stage, 6 beneficiary farmers were selected randomly from the selected villages. The data was recorded for four consecutive financial years, *i.e.* 2018-19, 2019-20, 2020-21 & 2021-22.

To test the significance of the variable considered i.e. education level with the change in consumption of agri-input for the production of *Basmati* variety of paddy; Chi-squared test was used. Chi-Squared Test (also written as χ^2 test) is a statistical hypothesis test that is valid to perform when the test statistic is chi-squared distributed under the null hypothesis, specifically Pearson's chi-squared test and variants thereof. Pearson's chi-squared test is used to determine whether there is a statistically significant difference between the expected frequencies and the observed frequencies in one or more categories of a contingency table.

$$\chi^2 = \Sigma \frac{(O_i - E_i)^2}{E_i}$$

χ^2 = chi-squared

E_i = observed value

O_i = expected value

For further analysis of data for the relationship between education-level and change in consumption, a linear regression model was used and a trend analysis of data was obtained.

$$Y = a + b_1 X_1 + b_2 X_2 + \varepsilon$$

Where,

Y = Dependent Variable (Consumption); a = Constant; b = Coefficient of Variable; X = Education_level; ε = Standard error

It is to be noted that for parametric transformation of categorical data of education level; they were assigned with numerical values in the form such as, illiterate as one (1); Primary education as two (2); Secondary education as three (3) and Higher education as four (4) in the record.

RESULTS AND DISCUSSION

Table 1 shows the results of chi-squared test for the education-level and consumption of beneficiary farmers under PM-KISAN scheme.

Table 1: Statistical Values of Education and Consumption

Observed Frequency			
Count of Education	**Column Labels**		
Row Labels	**No**	**Yes**	**Grand Total**
Higher	4.00	16.00	20.00
Illiterate	9.00	2.00	11.00
Primary	12.00	3.00	15.00
Secondary	9.00	5.00	14.00
Grand Total	34.00	26.00	60.00
Expected Frequency			
Count of Education	**Column Labels**		
Row Labels	**No**	**Yes**	**Grand Total**
Higher	11.33	8.67	20.00
Illiterate	6.23	4.77	11.00
Primary	8.50	6.50	15.00
Secondary	7.93	6.07	14.00
Grand Total	34.00	26.00	60.00
Chi-Squared Test	0.000573519		
p-Value =	0.00057		

From table 1, it could be observed that there exist a statically significant (*i.e.*, P-value = 0.00057) relationship between the education level and the level of consumption expenditure of beneficiary farmers under PM-KISAN. As P-value is greater than 0.05, which is the considered level of significance; the proposed null hypothesis which states that there is no significant relation between both the variables, is rejected. Hence further study with regression analysis was proceeded to formulate the extent of the relationship between the two variables.

Table 2: Model Summary

R Square	**Adjusted R Square**	**Std. Error of the Estimate**
.560	.515	570.456

The independent variable is T (Time period).

From table 2, we get the strength of correlation between the two variables, i.e. between the level of education and the level of consumption for agri-inputs used in the production of *Basmati* variety of paddy. The Pearson's coefficient (*i.e.*, r = 0.748) shows that the model depicts a positive correlation between the two variables with estimated standard error for model stands as 570.456. From results of ANOVA

which is displayed by table 3, it is clear that the established model is statistically significant (*i.e.*, Sig. Value > level of significance which is kept as 0.05). The degree of freedom in the model is kept as one.

Table 3 : Results of ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4133675.045	1	4133675.045	12.703	.005
Residual	3254195.452	10	325419.545		
Total	7387870.497	11			

The independent variable is T (time period).

Table 3 displayed the coefficient of estimator with standard errors in the model which could be used to exactly derive the relationship between the two variables considered in this study. Form table 3, it could be also understood that the model estimators are statistically significant as they stand below the level of significance (*i.e.*, < 0.05).

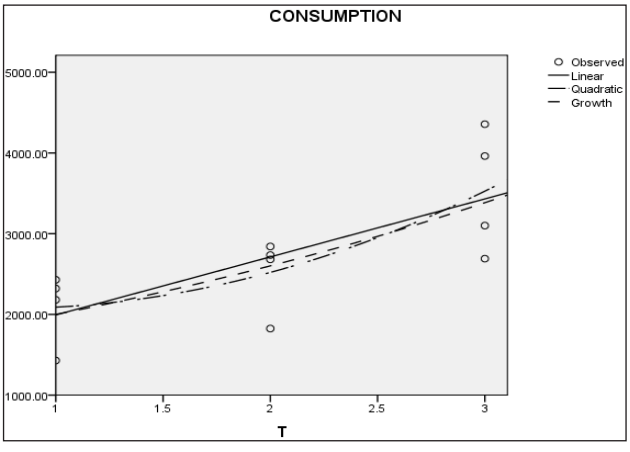

Fig. 1: The relationship between Consumption and Education

From Fig. 1, it could be depicted that a graph not exactly linear but slightly parabolic which is shown crossing most of the points in the observation. This could be also said for the growth curve in the graph. But as most of the inclination is towards the linear model of the graph, it is quite reasonable to depict the regression model is best fitted with the linear relationship between the variables.

From Fig. 2, it could be observed that there exist an upward trend for the consumption of agri-inputs for all the categories of farmers based on their education level. It could be seen that maximum increase in the level of consumption was observed in farmers with higher education; while least change in consumption was observed for farmers who were illiterate. The graph for consumption peaked in year 2021 which indicates that farmers have invested more during this year. Although PM-KISAN scheme was launched in year 2019 and the funds were disbursed in the same but its impact were observed during year 2021.

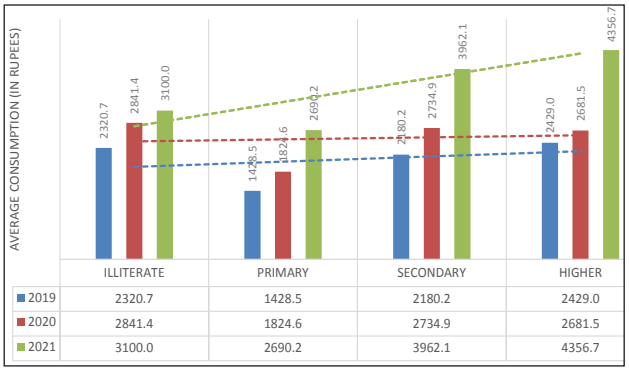

Fig. 2: Consumption of agri-inputs (in Rupees) by farmers with different level of education

Fig. 3 depicts the trend line with their standard errors for three consecutive years i.e., 2019, 2020 and 2021. It could be seen that maximum upward shift has been observed for year 2021. While the least shift for the consumption of agri-inputs was observed for year 2020. This might be due the impact of COVID-19 pandemic as the consumption for non-agricultural purpose (such as medical, food, etc.) also grew during the same year.

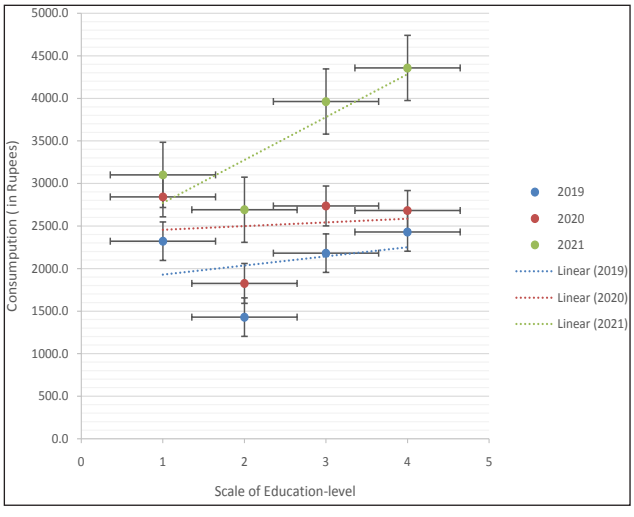

Fig. 3: Linear model with consumption and education

Table 4: Coefficients derived from linear regression model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
T	718.825	201.686	.748	3.564	.005
(Constant)	1274.833	435.693		2.926	.015

CONCLUSION

In the study, it was found that education had a significant impact on the consumption of agricultural inputs and it could be said that farmers with higher education consumed more agricultural inputs when compared to illiterate farmers. Adoption of new agricultural inputs are referred as adoption of new technologies such as HYV seeds, chemical protection, fertilizers, etc. for crop production. This was found to be similar to the findings of Riddell and Song (2012) who studied on the workers working in Canadian environment and concluded that formal education increases the usage of technologies that require or enable workers to carry out higher order task. Similarly, the main constraint in growth in agriculture sector is its uneducated manpower. Singh (2000) stressed that the fundamental problem of agricultural growth is an education problem and concluded that human resource development requires considerable investment in education, health, and nutrition. For serve this purpose and removal of this constraint, ground-level training and regular farmer visit should be conducted. Also suggestion regarding the investment of funds for productive usage should be given. In this regard, Ranjan *et al.* (2018) suggested that farmers' field school program must be implemented along with a strong extension network in the study area for wider dissemination of modern technology. The study suggests that proper monitoring and mid-term evaluation of the funds utilization by the farmers under the scheme should be mandated and proper guidance should be given to farmers for entrepreneurial activities.

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