



Research Note

Adoption of vegetable cultivation : A discriminant function analysis

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SUMMARY : The present study was conducted in Barpeta district of Assam to discriminate the selected factors of vegetables growers responsible for low and high adoption level of vegetable cultivation. Data were collected from 200 vegetable growers. It was found that cosmopoliteness, utilization of sources of information and training status were the three important variables indiscriminately contributing more than the average distances as compared to other variables in discriminating low and high level of adoption of vegetable cultivation.

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Discriminant function analysis, Adoption index, Cosmopoliteness

During the past three decades the country has made commendable progress in vegetable research and development, enabling it to secure second position in vegetable production in the world. Indian farmers grow an amazing number of different vegetables, 175 different types in all, but potato, onion, tomato, cabbage and cauliflower account for 60 per cent of the total production. Interestingly, during the last decade, the increase in area under vegetable crop was merely 0.42 per cent while the production has increased by 78.91 per cent. The credit for this vertical expansion goes to improved varieties and modernization of production and protection technologies. However, as the country's population is increasing @ 1.8 per cent, our vegetable requirement up to 2030 will be 151-193 million tones. It was observed that there is a wide gap between the available technologies and its application in farmers' field. There has been a slow adoption of sustainable practices by the farmers. This clearly indicates that the adoption is determined not only by the availability of sustainable technologies but by various other amalgams of factors. Considering the above facts, the present study was designed to

discriminate the selected factors responsible for low and high level of adoption of vegetable cultivation practices.

The study was conducted in Barpeta district of Assam. Out of 12 blocks of Barpeta subdivision, two blocks – Bhawanipur and Gobardhana were selected randomly. From each block, two Gram Panchayats were selected randomly. Four villages, one each from every Gram Panchayat where vegetable cultivation had been becoming very popular in recent years were purposively selected with the help of local Agricultural Development Officer and Village Level Extension Workers. From the four selected villages a total of 200 respondents were selected using proportionate random sampling method on the basis of no. of households in the village. Head of the family who was actively engaged in cultivation was taken as a unit of analysis for this study.

A list of agricultural innovations which had been advocated for the vegetable farming in Barpeta district – particularly in the selected blocks was prepared in consultation with the district and block level agricultural experts, Village Level Extension Workers and officials

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of Field Management Committees. A total of 45 numbers of innovations were used for the study.

As suggested by Dasgupta (1974) following formula was used to measure adoption index for a particular innovation.

$$\text{Adoption index} = \frac{\text{No. of years the innovation have been in use}}{\text{No. of years when the innovation was introduced in the locality}} \times \frac{\text{Percentage of potential area covered}}{\text{Percentage of potential area covered}}$$

To get the actual adoption index for a particular respondent the adoption indexes he received for all the 45 innovations were added together.

Later the respondents were classified into three groups viz., low, medium and high adoption levels based on their mean and standard deviation as a measure of check. Only low and high adoption groups were considered for the purpose of comparison and to conduct discriminate function analysis.

A total of 20 variables were selected and classified in to socio-psychological, agro-economic and management groups based on review of literature. The draft schedule for collection of data, incorporating the tools and techniques of different variables was prepared and presented twice each time on farmers. Before final data collection, entire schedule was pre tested for elimination, addition and alteration with non-sample respondents of the study area. In pre-testing, care was taken not to include respondents who were selected as sample for final interview. On the basis of experiences in pre testing appropriate changes in the construction of item and their sequence were made and the schedule was then finalized.

Discriminant analysis is an important statistical tool to isolate factors having high and low level of discriminant efficacy to make a distance between what we called a high and low level of any performance. Here in the given analysis linear discriminant function, L(I), had been isolated and

Table 1: Discriminant analysis: High and low level of modernization

Sr. No.	Variables	Group difference D (I)	't' value of D (I)	Discriminant function co-efficient L (I)	Discriminant index L (I) X D (I)/ D ² X 100	Rank
1.	Age (X ₁)	-0.81	-0.54	-0.072	2.435	VII
2.	Education (X ₂)	-0.02	-0.09	-0.082	0.068	XX
3.	Annual income (X ₃)	-0.18	-0.07	-0.023	0.173	XVIII
4.	Size of holding (X ₄)	0.47	0.53	-0.032	-0.625	XIV
5.	Cropping intensity (X ₅)	-0.20	-0.03	-0.014	0.117	XIX
6.	Farming experiences (X ₆)	0.44	0.32	0.079	1.453	X
7.	Material possession (X ₇)	0.1	0.7	0.102	0.594	XVI
8.	Training status (X ₈)	3.5	3.56	0.140	20.311	III
9.	Irrigation status (X ₉)	2.44	1.10	0.014	1.470	IX
10.	Socio politico participation (X ₁₀)	-0.15	-0.71	-0.138	0.860	XIII
11.	Cosmo politeness (X ₁₁)	-1.12	-3.48	-0.669	31.096	I
12.	Utilization of sources of information (X ₁₂)	2.87	3.38	0.201	23.983	II
13.	Achievement motivation (X ₁₃)	0.43	1.17	-0.065	-1.160	XI
14.	Scientific orientation (X ₁₄)	2.40	2.5	0.036	3.604	V
15.	Risk preference (X ₁₅)	1.7	2.2	0.085	6.122	IV
16.	Non- fatalistic orientation (X ₁₆)	7.0	2.01	0.005	1.476	VIII
17.	Management Orientation (X ₁₇)	0.95	0.60	-0.022	-0.868	XII
18.	Value orientation (X ₁₈)	0.74	0.90	-0.099	-3.066	VI
19.	Economic motivation (X ₁₉)	0.98	1.41	0.014	0.598	XV
20.	Innovation proneness (X ₂₀)	0.79	1.12	0.007	0.254	XVII

D² = 0.24117 E+01 Hotelling T² = 0.1156 E+0 F-value for T² = 5.162** with 21 and 178 df.

multiplied it with group difference that is $D(I)$ and subsequently had been divided by D^2 value to get the standardized distance created by the causal factor. Fischer's discriminant function analysis was applied for the purpose of finding out the relative importance of 20 selected variables with regard to their power to discriminate among different variables that effected adoption level of vegetable growers.

The results relating to the Fischer's discriminant function analysis are presented in Table 1. It is clear from table that the variable cosmopolitness had created 31.09 per cent of the total distance between high and low level of adoption. This had been followed by utilization of sources of information (23.98 %) and training status (20.31 %). The relative rank of other variables is also shown in the above mentioned Table 1.

Cosmopoliteness is both the mean and end in getting anybody modern. Diverse knowledge domain, attitudinal readiness and adoptional versatility are all being contributed by cosmopolite mind. That was why cosmopoliteness amounted to use difference between low and high level of adoption

Utilization of sources information got the second

position in deciding on the level of adoption. The role of information accessing specially in areas of enterprising agriculture had become not only critical but also decisive. That was how utilization of sources of information had contributed perceptible efficacy to create distance between what we called the high and low level of adoption

Training status, next to utilization of sources of information came up substantially to create discrimination between high and low level of adoption. Training is not only a capacity building process in physical and psychological term but also a climate setting process for any person to perform and exert. So quite logically the variable had shown a substantive discriminant efficacy as the earlier two variables.

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