A Study on Adoption Behaviour of Farmers in Kashmir Valley

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ABSTRACT

Ever increasing demand for food and food security has narrowed down the scope for horizontal expansion in agricultural production. A major reform in terms of technological and institutional breakthroughs to put traditional agriculture on modern lines is need of the hour. Even though, in India at present there is a prospective technological base at farmers' disposal but given the poor socioeconomic status of our almost all the farmers, the exploitation of these technologies at farm level is yet lacking. What are the causes and motives behind the adoption or non-adoption of the technology base among our diverse farming community is the main objective of this study which has been carried out in the Kashmir valley of North India. The results revealed that accessibility and cost effectiveness are among the potential causes of non-adoption of recommended technologies, and that very encouraging levels of the factors viz. education size, income commercialization index lead to a high rates of adoption. Out of 80 farmers 41.25% farmers were found to have high rate of technology adoption in an average crop where as 32.50 & 26.25% farmers had adopted medium and low levels of technology. It was also found that maximum i.e., 60.00, 58.33, 80.00, 63.16, 45.16, 90.91& 60.72% of farmers having very encouraging (favourable) levels of farm size, education, surplus income, commercialization index, farming experience, distance from ATC and attitude towards ATC had attained high level of technology.

Key words : Food security; Cost effectiveness; Commercialization index;

Squeezing natural resources (mainly land) coupled with increasing demand for food and food security has its only way out in vertical expansion in the agricultural production, which requires a location and product specific technological interventions at field level, and thereby to put traditional agriculture on modern lines progressively. Besides enhancing production, these interventions are expected not only to stimulate a definite shift in cultural practices on a farm but may encourage a shift in investment layout, farm inventory and farm plan - say, the farming on the whole (*Ramrati, 1964*).

India – an agriculture predominant nation, where this sector contributes about 1/4th of its GDP and where more than 60 % population derive their livelihood from this sector, faces a challenge in terms of ensuring food security to its alarmingly increasing population; and therefore is hell bent over modernizing its agriculture industry through proper blending of technologies adoptable in Indian context. But given the poor socioeconomic status of our almost all the farmers the transformation rate is quiet disappointing; which is feared to continue until a proper extension work matched with some incentives to farmers to transform themselves are not assured. Studies have revealed that either the poor attitude towards or poor access to all these technologies are the two general causes of non adoption (*Joshi and Pushkar Lal, 1977*). So in order to address these, massive efforts are required to come out of this messege systematically; but prior to this the existing technology adoption behaviour and underlying motives of our farmers needs to be studied so that a proper and scientific action plan can be formulated. With this objective in mind the present study has been carried out in the Kashmir situation where the effective agricultural extension service is yet to take off at desired norms.

METHODOLOGY

The present study has been carried out with a primary objective of assessing existing technology adoption behaviour and underlying motives/causes in the purposively selected two districts (Anantnag and Pulwama) of Kashmir valley. For sampling 02 blocks from each district, 02 villages from each block and 10 selective farmers from each village making a total numbers of 80 farmers with noticeably diverse socioeconomic status were sampled out (Table 1).

Selection of farmers and villages : Farmers and villages were selected keeping in mind the diversity of their socioeconomic status and the distance from any agricultural technology centre (ATIC) like, KVK, Gov't farm etc. Also it was hypothesized that type and nature of crop does have an impact on the adoption of particular technology in production of that particular crop; therefore only those farmers were selected whose cropping pattern would apportion maximum acreage to either of the three purposively selected crops viz. Paddy, Oats or vegetables in the year of study.

Table 1. Sampling path followed

S.No.	Districts	Blocks	Villages	Farmers
1	Anantnag	Dachhnipora	Veer	10
2			Krandigam	10
3		Khowripora	Aishmuqam	10
4			SeerHamdan	10
5	Pulwama	Tral	Darsaro	10
6			Lorgam	10
7		Pampore	Khrew	10
8			Wyuen	10
Total	2	4	8	80

Selection of crops : Following three distinct crops were selected based on the assumption that farmers would adopt different levels of technology in different crops due to their different nature, type and importance for farmer.

Paddy : Paddy being more a staple crop than commercial is of prime importance for ordinary farmer and therefore will not be compromised (in terms of adoption/ implementation of available and accessible technologies) for quality and optimum production.

Oats : A fodder crop being raised with least possible inputs in the sampled area in winter mainly for domestic consumption and therefore bears least importance, so farmers are less expected to choose expensive technologies in this crop.

Vegetables : A commercial crop and regular income generator. Farmers are expected to adopt all those accessible technologies (like hybrid seeds, early maturing varieties and alike) which ensure them maximum returns per unit of land and time.

Selection of variables : Seven characters (variables) having an impact on adoption behavior, as identified after discussion/interview with farmers and extension workers and results of previous studies, were selected to know the extent of underlying motives for adoption or non-adoption of technologies. The lower level of these variables for any farmer has a discouraging effect on his adoption behaviour and vice versa; therefore, the farmers were scored against each variable and were accordingly sub-grouped in three categories viz. (1) Very Encouraging, (2) Encouraging and (3) Discouraging.

Analytical tools: Simple percentages and averages were used to derive results. Average rate of adoption was calculated as follows.

$$R_A\ (\%) = \sum_{i=1}^{n} [(A_L/R_L)*100]$$

Where :

R_A = Average rate of adoption

A_L = Actual level of technology used as Seed rate, doses of NPK etc by n^{th} farmer.

R_L = Recommended level of above technologies used by n^{th} farmer.

On account of wide range of rate of adoption, farmers were categorized as 'High' (those having rate of adoption between 75% and above), 'Medium' and 'Low' having rate of adoption between 40 -75% and below 40% respectively.

RESULTS AND DISCUSSION

As mentioned earlier, it was assumed that importance, nature and type of crop have an effect on rate of adoption of technology in that crop. In this context Table 2 evaluates the rate of technology adopted in selected crops.

Table 2. Crop wise distribution of farmers in various technology groups

Crop	High		Medium		Low	
	%	Av.rate of adoption	%	Av. rate of adoption	%	Av. rate of adoption
Paddy	46.25	86.32	20.00	62.17	33.25	34.84
Oats	23.75	79.54	48.75	48.09	27.50	29.12
Vegetables	53.75	84.34	28.75	57.98	17.50	39.24
Average	41.25	83.40	32.50	56.08	26.25	34.40

It is evident from the table that 41.25% farmers have high rate of technology adoption of about 83% in an average crop where as 32.50 & 26.25% farmers have adopted medium and low level of technology of about 56.08 & 34.40% respectively. It is also evident that rate of technology adoption of sampled farmers is as low as 29.12% in Oats and as high as 86.32% in paddy. Farmers

seem to have more tendency towards vegetables in terms of technology adoption followed by Paddy and Oats, since 53.75% farmers have high rate of technology adoption in vegetables than comparatively less number of farmers (46.25% & 23.75%) in paddy and Oats; where as only 17.50% have low rate of technology adoption in vegetables as compared to 33.25& 27.50 % farmers in Paddy & Oats respectively. It can thus be concluded that farmers prefer to adopt new and productive technologies in the crops bearing more importance for them, thereby supporting our assumption that importance and nature of crop does have an impact on the rate of adoption of technologies in that crop.

Table 3 enlists the constituent technologies of a crop on one side and the distribution of farmers according to their rate of technology adoption in different technology groups. It was found that technology adoption level was highest in fertilization technology where about 53% farmers used it up to high level and only 15.41% farmers used it up to low level. The highest number of farmers were having low rate of technology adoption , recorded in case of FYM where about 70% farmers used FYM up to only low (0-40%) level as compared to 7.5% who used it by high (75-100%) level. Satisfactory number of farmers having high rate of technology adoption was also recorded in seed rate and number of irrigations, where as in case of area under HYV and spacing, maximum farmers had low to medium level of technology.

Table 3. Technology wise distribution of farmers in various technology groups

S. No.	Name of Technology	High		Medium		Low	
		No.	%	No.	%	No.	%
1.	Area under HYV	12	15.00	23	28.75	45	56.25
2.	Seed rate	42	52.50	28	35.00	10	12.50
3.	Spacing	18	22.50	45	56.25	17	21.25
4.	Fertilizers						
	(a) N	53	66.25	20	25.00	07	8.75
	(b) P	41	51.25	27	33.75	12	15.00
	(c) K	33	41.25	29	36.25	18	22.50
5.	FYM	06	07.50	18	22.50	56	70.00
6.	No. of irrigations	59	37.75	18	22.50	03	3.75
	Average	33	41.25	26	32.50	21	26.25

From the above table it can be realized that number of farmers having high rate of technology adoption is more in the easily accessible and less expensive technologies like fertilization, seed rate and number of irrigations. It can thus be generalized that accessibility and cost effectiveness are among the potential causes of non-adoption of recommended technologies in the sample area.

Socio economic cum behavioral status has been found to have a definite impact on farmers' technology adoption level; so the Table 4 was designed to reflect the impact of different socioeconomic cum behavioral variables of farmers upon their rates of technology adoption. The characters (variables) thus identified are farm size, educational status of farm family head, surplus income per annum from all sources which could be reinvested in farming business after meeting other priority expenditures, commercialization index (i.e. percentage of marketed surplus to total production of any crop), farming experience, attitude towards Agriculture technology information centers, govt. farms, agriculture universities etc and distance from such centres.

Commercialization index was included as one of the attribute as commercial farmers believed that more technology means more production and more production means more income, whereas non commercial farmers did believe on traditional technology to yield them enough up to subsistence level. Similarly farming experience is a practical tool with farmers to distinguish between traditional and modern technology and therefore, is a significant factor to weigh against the adoption level thereof. The table thus provides us with a lot of information regarding the interplay of rate of technology adoption and the hypothetically causal factors viz. education, farm size, attitude and so on. The results in the table favour the hypothesis / assumption that very encouraging (V.E) levels of the factors viz. education size, income commercialization index lead to a high rates of adoption, however a discouraging levels (D) of any factor might negate the effects of very encouraging levels of other factors on adoption level e.g. as in table 4, only 9% of farmers having high attitude do not have high adoption levels, may be because that they might not have enough surplus income to invest in new technologies.

It is evident from the table that maximum (60.00, 58.33, 80.00, 63.16, 45.16, 90.91& 60.72%) of farmers having very encouraging levels of farm size, education, surplus income, commercialization index, farming experience, distance from ATC and attitude towards ATC have attained high level of technology adoption , whereas 72.50, 70.21, 79.55, 71.11, 80.00, 88.63 and 86.67% farmers having discouraging levels of these factors have attained medium to low levels of technology. It is even clearer that considerable %age of farmers (50% & more) with medium level status in all factors have attained high rates of adoption, which indicates that farmers do adapt to the level they are accessed to. So adoption behavior

of any farmer can thus be stated to be a function (effect) of various inherent characters which need to be identified and then addressed by the govt. through proper extension network.

Table 4 reveals that the response of adoption behavior of farmers to average level of all the seven attributes. It is clear that high technology group curve bends down as the attributes move from very encouraging level to discouraging level, and similarly, low technology group moves upwards as they move from very encouraging level to discouraging level, indicating a proportionality between technology adoption level of the farmers and their attributes; i.e. their socioeconomic cum attitudinal status.

Table 4. Distribution of farmers in various technology groups according to different degrees of various attributes

S. No	Attribute	Degree	Size*		High	Medium	Low
			N	%			
1.	Farm size	V.E	15	18.75	60.00	26.67	13.33
		E	25	31.25	52.00	20.00	28.00
		D	40	50.00	27.50	42.50	30.00
2.	Education	V.E	12	15.00	58.33	16.67	25.00
		E	21	26.25	54.14	14.29	28.57
		D	47	58.75	29.79	44.68	25.53
3.	Surplus income	V.E	10	12.50	80.00	10.00	10.00
		E	26	32.50	61.54	30.77	7.69
		D	44	55.00	20.45	38.64	40.91
4.	Commercialization index	V.E	19	23.75	63.16	21.05	15.79
		E	16	20.00	50.00	25.00	25.00
		D	45	56.25	28.89	40.00	31.11
5.	Farming experience	V.E	62	77.50	45.16	30.65	24.19
		E	13	16.25	30.77	38.46	30.77
		D	05	6.25	20.00	40.00	40.00
6.	Attitude towards ATC	V.E	11	13.75	90.91	9.09	0.00
		E	25	31.25	72.00	20.00	8.00
		D	44	55.00	11.36	45.45	43.18
7.	Distance from ATC	V.E	28	35.00	60.72	28.57	10.71
		E	37	46.25	37.83	45.95	16.22
		D	15	18.75	13.33	6.67	80.00

* % represent percentage to total respondents V.E = Very Encouraging, E = Encouraging, D = Discouraging

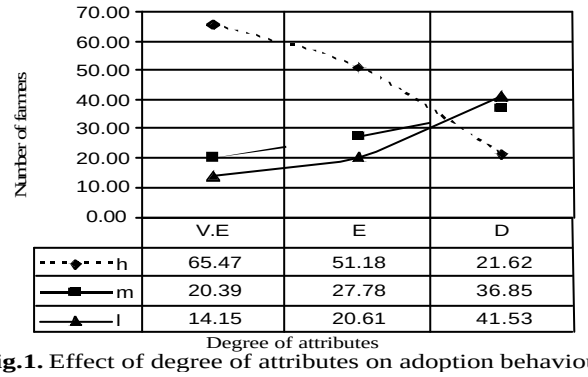

Fig.1. Effect of degree of attributes on adoption behaviour

CONCLUSION

Major technological interventions have a key role to play in improving the efficiency of farmer and farming business, but the extent of the adaptability of these technologies has been the major concern on farmers part. On account of poor access to these technologies in terms of cost effectiveness and availability, farmers rate of adoption has been very low as it was found that considerable percentage of farmers with medium levels of education, surplus income, farm size etc have attained high rates of adoption, which indicates that farmers do adapt to technologies as per their accessibility.

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