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A study on adoption about the recommended agricultural practices through ATMA by paddy growers in Budgam region of Kashmir

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Abstract
The study was conducted to know the adoption level of paddy growers of block Budgam about various agricultural practices comprising of 200 respondents (150 trained and 50 untrained). The majority of farmers covered under the ATMA programme were of middle age group, having middle standard qualification, medium family size (5-8 members) and medium experience in farming (16-25 years). There was significant relationship between age, education, experience in farming, sources of information with adoption level of farmers. There has been considerable improvement in adoption of new technologies and farm practices among the trained farmers. The services rendered by the Department of Agriculture were regular training programmes during cropping season (83.33%), supply of written material during training (82.22%), protection from exploitation of middlemen (65.56%) and conducting demonstrations on farmer's field (61.82%). The ATMAs are expected to support the state extension system by making it more broad-based and participatory for planning, implementing and monitoring the extension activities of a district. The purpose of this component was to test new approaches to technology transfer, new organizational arrangements, and operational procedures. For evaluation of field level impact of ATMA model, beneficiaries (target farmers) of both trained and un-trained were compared.

Keywords: Paddy production**,** impact, ATMA, adoption, technological interventions

Introduction
Paddy (*Oryza sativa .L*) is one of the important cereal crops of the world and forms the staple food for more than 50 per cent of population and is known as "King of Cereals". Rice is one of the most important staple diets of 2.7 billion people in different parts of the world. It's cultivation is of immense importance to food security of Asia, where more than ninety per cent of the global rice is produced and consumed. (*FAO, 2010*) [3]. Agriculture is the mainstay of more than 80 per cent people in Jammu & Kashmir. In Jammu and Kashmir, Rice is the main staple food crop of the state and most of the farmers are earning good amount of their produce in Kashmir valley as well as in the Jammu region. Small farmers are generally producing the rice for their consumption purposes only. Although area under rice is very small of about 0.27 m ha, still it plays an important role in the state economy. Rice productivity in the state is high (2.2 t/ha) compared to the national average productivity of about 1.9 t/ha. The total annual rice production in the state is about more than 0.59 MT.

A major need of the developing countries is to raise the standard of living of the people in general and ruralities in specific. In India, where agriculture occupies a dominant position in the economy of country, economic growth and progress actually depends to a large extent on the improvement of agricultural technology and adoption of agricultural innovations by the farmers. Therefore, it is necessary to change the attitude of the farmers so that they may shift from traditional to modern methods of farming. For this purpose, it is essential to disseminate the useful technical know-how to the millions of farmers. There has been a significant progress in increasing crop production, productivity and acquiring fair degrees of self-reliance over the last decades. This is mainly attributable to the policies, strategies and programmes adopted by the government and also the intensive efforts made by the state agricultural universities and ICAR institutes to achieve a dynamic response of the farmers (Barath and Pandey, 2005) [2].

The adoption of new technologies and modern farm practices in agriculture is a continuous process maintained by the farmers. Sometimes farmers motivated by the advancement of new agricultural research as a result of its extension activities towards its adoption. On the other hand their knowledge and experience help them or rather to say compel them to adopt new practices to keep agricultural practices ongoing and to maintain their livelihood properly.

Although, scientific research in agriculture is moving fast and new techniques are being added continuously, so far only 20 per cent of the available technology has been adopted by the farmers that too only among 10 per cent of farming population. It is seen that productivity levels of different crops are very low. In order to increase the crop yields, the level of adoption of improved farm practices has to be enhanced. Knowledge of the recommended technologies is a pre-requisite to the adoption process. The basic input for achieving higher productivity in the assimilation of technological knowledge is one of the important component of behaviour and as such it plays a major role in covert and overt behaviour of human beings. Knowledge of the technology is the basic requirement as it gives impetus to adopt technology. The adoption of any technologies depends on the individual development and acceptance of modern agricultural technology is the prime attention for increasing crop production. It is generally observed that all the farmers do not use recommended practices. It is the experience of the extension workers that many practices including plant protection measures in spite of their merits are not accepted widely by the farmers. Some technologies record very slow rate of adoption. It is therefore, a question as to why one practice is more readily adopted than the other. One of the possible answers is some innate characteristics of the practice, which may speed up or retard its rate of adoption. The differential rate of adoption of farm technologies by the farmers is generally attributed to some of the personal and socio-economic characteristics of farmers. (Awotide *et al*, 2016) [1].

Training of the farmers is essential to induce motivation, create confidence and inculcate efficiency among individuals. Training of the farmers is also inevitable for imparting new knowledge and updating the skills of farmers. Training of the farmers had assumed further importance and urgency in the context of the high yielding varieties and improved practices in agriculture and allied fields. Thus training plays a very important role for human resource development. In order to make any training meaningful and effective, it is imperative on the part of the training organizers to identify the training needs of the farmers based on which a suitable training module can be developed so that the appropriate training is given to the right people, in the right form and at the right time so that higher degree of productivity and profitability can be achieved (Prajapati and Patel, 2013) [6].

Convincing farmers about applicability of innovations under prevailing situation is an uphill task. Farmers like other people believe and are influenced by trainings conducted under different programmes. Trainings under ATMA programme thus plays an important role in convincing farmers on efficacy of new technologies. The trainings have been recognised as one of the important extension methods and occupy a very unique position in extension programmes in developing countries like India. The productivity of paddy is far from satisfactory levels. The results of the past research studies indicated that there is a vast scope to enhance the yield potentiality of the paddy by using recommended Paddy Production Technology. Hence, the present study is intended to address the specific objective to study the adoption level of recommended Paddy Production Practices of the farmers trained under ATMA.

Methodology

The present study was conducted in District Budgam of Jammu and Kashmir state to find out the Impact of Farmer's Training on Paddy production Technology under ATMA. District Budgam comprises of 8 blocks where the ATMA programme was launched in the year 2005-06. one block i.e., Block Budgam was selected purposively as having more number of Paddy growers and occupy more area under Paddy. Also more number of farmers has undergone different trainings under ATMA as compared to other blocks of the district.

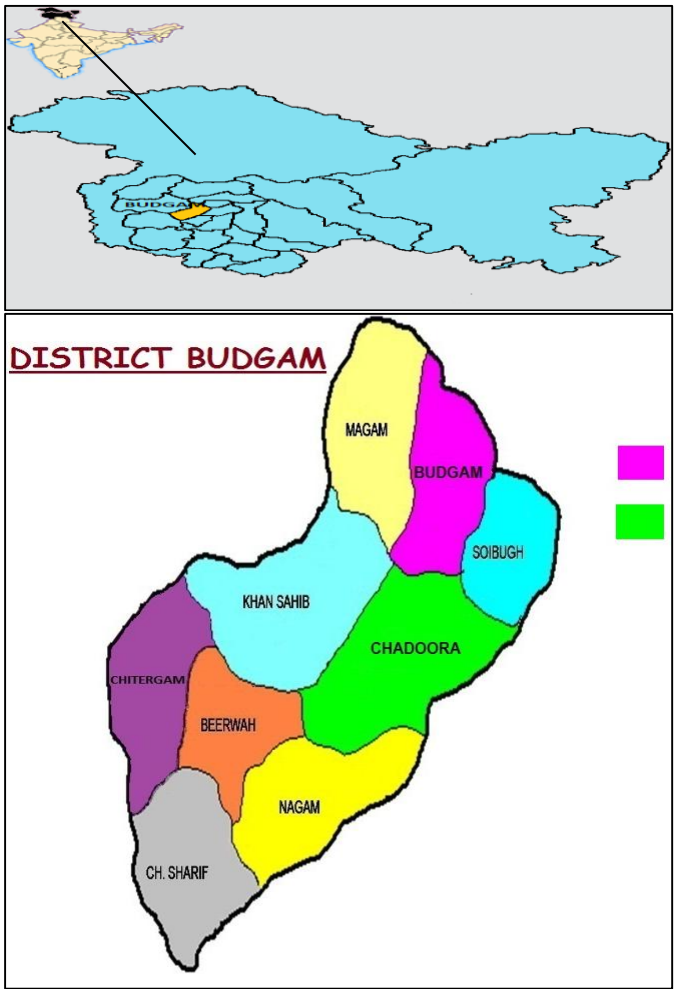


Fig 1: Map showing the study area

There were 340 farmers in block Budgam who had attended trainings under ATMA. Out of these farmers a sample of 68 farmers from Budgam were randomly selected on the basis of proportional allocation. In addition to this, a list of un-trained farmers from the same villages was prepared and a sample of 50 farmers was selected randomly.

An Interview Schedule was constructed based upon the objectives, variables and available literature on the topic. The schedule was prepared in English language. While preparing the schedule, due care was taken to avoid questions with dual meaning and contradictory statements. The language used for the questions was simple for easy understanding. In this way the research schedule was constructed to collect the necessary information.

The author personally interviewed the respondents included in the sample. The help of concerned Sub-Divisional Agricultural Officers (SDAOs) was sought for obtaining the list of trained farmers. The importance and objectives of the study were clearly explained to all the member farmers. They were assured that all the information furnished by them will be kept confidential and would be used for the research study only.

The qualitative data was quantified by using various statistical tools and working out different scores in order to find out the nature of association between dependent and independent variables

1. Independent Variables

1.1 Age

It is one of the basic characteristic of an individual linked with his maturity, physical fitness and productivity. At the time of interview, chronological age was considered. The respondents according to age were classified into three categories.

a. 44 years and below - Low (Young)
b. 45 to 62 years - Medium (Middle Age)
c. 63 years and above - High (Old Age)

1.2 Education

The level of formal education attained by an individual tends to influence the extent to which an individual is exposed to new ideas and outer world. According to formal education, the respondents were classified into following categories.

a. Illiterate
b. Middle
c. Matric
d. 10+2
e. Graduate
f. Graduate and above

1.3 Family Size

The size of family refers to the number of members in the family. Considering the number of members in the family, the respondents were classified into three categories.

a. 4 members and below - Low
b. 5 to 8 members - Medium
c. 9 and above members - High

1.4 Annual Income

This includes the annual income of the member farmers from Agriculture and all other sources. According to their level of income, the member farmers were classified into three categories.

a. Rs 60,000 and below - Low
b. Rs 60,001 to Rs 1,20,000 - Medium
c. Above Rs 1,20,000 - High

1.5 Land Holding

The land holding refers to the total land possessed by an individual farmer. According to the extent of land possessed by them, the member farmers were classified into three categories.

1. 2 hectares and below - Low
2. 2.1 to 4 hectares - Medium
3. Above 4 hectare - High

1.6 Experience in farming

Experience in farming means the number of years for which the member farmer has been practicing farming. As per their experience in farming the member farmers were classified into three categories.

a. 15 years and below - Low
b. 16 to 25 years - Medium
c. 25 years and above - High

1.7 Sources of Information

The source of information refers to the use of different sources by the member farmer for obtaining information regarding Paddy Production Practices. The score was worked out by assigning score one to each of the source used by the member farmer. The total score of each farmer was worked out and the member farmers were grouped into three categories.

a. Score 2 and below - Low
b. Score 2 to 4 - Medium
c. Score 4 and above - High

1.8 Social Participation

Social participation refers to the participation of a member farmer in various formal and informal organizations. The score was worked out by assigning one score to each member farmer having ordinary membership in one social organization score two was assigned to office bearer and zero score was assigned to the no member. The total score of each farmer was calculated and according to the score they were classified into three categories.

a. Score 2 and below - Low
b. Score 2 to 4 - Medium
c. Score 4 and above - High

1.9 Economic Motivation

The economic motivation refers to the motivation of an individual in all aspects leading to his development. The score was worked out by assigning score two to statement agree, score one to undecided and zero score to disagree. The total score was calculated by summing up scores of all statements and on the basis of the total score obtained by each member farmer, they were classified into three categories.

a. Score 2 and below - Low
b. Score 2 to 4 - Medium
c. Score 4 and above - High

1.10 State of Modernization

The state of modernization here refers to the recommended paddy production practices possessed by the member farmers. Each of the recommended paddy production practice possessed by the farmer was assigned one score. The total score was worked out and on the basis of the total score gained by each member farmer, they were classified into three categories.

a. Score 2 and below - Low
b. Score 2 to 4 - Medium
c. Score 4 and above - High

2 Dependent Variables

2.1 Knowledge

Knowledge refers to the farmer's understanding of different recommended Paddy Production Practices or it refers to the body of information understood and retained by the farmers about recommended Paddy Production Practices. In this study, all the important Paddy Production Practices were listed in consultation with the experts in the field. A total number of 22 common recommended Paddy Production Practices were selected based on the judgement of specialists. The relevant answers for these items were obtained with the help of package of practices and cereal crop experts of the Sher-e-Kashmir University of Agricultural Sciences and Technology, Kashmir. The knowledge level of the member farmers was worked out by assigning score two for complete knowledge, score one for partial knowledge and zero for no knowledge.

a. Score 7 and below - Low
b. Score 8 to 15 - Medium
c. Score 16 and above - High

2.2 Adoption

Adoption is a mental process in which an individual passes from first hearing of an innovation to its final adoption. The term adoption in this study means the use of recommended Paddy Production Practices for getting expected benefits. In this study, all the important Paddy Production Practices were listed in consultation with the experts in the field. A total number of 20 common recommended Paddy Production Practices were selected based on the judgement of experts. The proper answers for these items were obtained with the help of package of practices and Paddy experts of the Sher-e-Kashmir University of Agricultural Sciences and Technology, Kashmir. The adoption level of the member farmers was worked out by assigning score two for complete adoption, score one for partial adoption and zero for no adoption.

a. Score 5 and below - Low
b. Score 6 to 11 - Medium
c. Score 12 and above - High

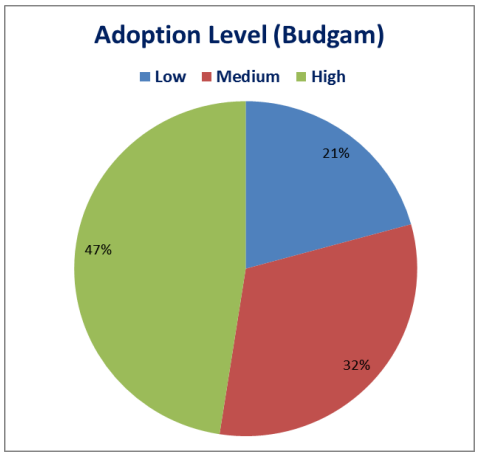
3. Statistical Analysis

The data collected was processed, quantified, categorized and tabulated. The established parameters like mean, frequency, percentage and Karl Pearson's product movement correlation coefficient were calculated.

Results and Discussion

Table 1: Adoption Level of Trained Farmers

Adoption level	Frequency	Percentage
Low (upto 5)	17	20.73
Medium (6-11)	26	31.71
High (12 and above)	39	47.56



From Table 1, it is evident from the results that among the trained farmers from block Budgam, only 20.73 per cent belong to low adoption category. While as 31.71 per cent of the trained farmers belong to medium adoption category. Near about fifty per cent (47.56%) of the trained farmers belong to high adoption category. It is a well-known fact that all recommended Paddy Production Practices cannot be adopted by all trained farmers simultaneously. The adoption of recommended Paddy Production Practices is a complex process which needs mental thinking, executive power, responsibility and risk bearing ability. The inference that could be drawn from the above findings is that a large number of trained farmers have adopted the recommended Paddy Production Practices; the probable reason for this might be that the trained farmers have higher knowledge level. The findings of the study are in accordance with the findings of Farid *et al*., 2015 [5].

Table 2: Adoption Level Of Respondents Regarding Recommended Paddy Production Practices.

		Adoption level					
		Frequency			Percentage		
S. No	Practices	Low	Medium	High	Low	Medium	High
1.	Paddy varieties	06	15	61	07.32	18.29	74.39
2.	Type of soil	03	09	70	03.66	10.98	85.36
3.	Methods of sowing	08	06	64	09.76	12.20	78.04
4.	Time of sowing	10	22	60	12.20	14.63	73.17
5.	Nursery Preparation	04	06	22	04.88	07.32	75.60
6.	Soil Testing	59	10	13	71.95	12.20	15.85
7.	Fertilizer Dosage	12	12	58	14.63	14.63	70.74
8.	Fertilizer Application	12	14	56	14.63	17.07	68.30
9.	Seed Rate	04	05	73	04.88	06.08	89.02
10.	Spacing	07	04	71	08.54	04.88	86.58
11.	Time of transplanting	02	05	75	02.44	06.10	91.46
12.	Seedlings per Hill	09	10	63	10.98	12.20	76.82
13.	Weed management	54	17	11	65.85	20.73	13.42
14.	Water management	57	18	07	69.51	21.95	08.54
15.	Disease management	56	10	16	68.29	12.20	19.51
16.	Pest management	61	13	08	74.39	15.85	09.76
17.	Harvesting	07	08	67	08.54	09.76	81.70
18.	Storage	03	05	74	03.66	06.10	90.24

The adoption levels of farmers about various farm practices in paddy cultivation were presented in Table-2. It revealed that majority of the farmers from block Budgam belonged to high adoption category followed by trained farmers belong to the medium knowledge category. Adoption of farmers depends upon their personal, socio-economic characteristics. Statistically there was a significant relationship between education and knowledge.It indicates that farmers level of education, training status, communication score and land holdings have strong positive relation with adoption of improved farm practices. Similar results were obtained by Farid *et al*., 2015 [5]. Fifty per cent of the member farmers had middle level education. There was a significant relationship between education and adoption (r=0.416). This might be due to the fact that education brings about desirable changes in an individual's knowledge, attitude and skill. Higher the education, higher is the knowledge and adoption of recommended Paddy Production Practices. It seems that

comparatively higher education level of member farmers must have enabled them to make use of relevant literature and might have better contacts with extension agency.

Table 3: Relationship between Personal, Socio-economic Characteristics and Adoption Level of Trained Farmers

S. No	Characteristics	Correlation Coefficient (r)	p-value
1	Age	0.182	0.0258
2	Education	0.416	0.0000*
3	Family Size	0.101	0.2188
4	Annual Income	0.128	0.1185
5	Land Holding	0.248	0.0022*
6	Experience in farming	0.311	0.0001*
7	Sources of Information	0.117	0.1539
8	Social Participation	0.239	0.0032*
9	Economic Motivation	0.102	0.2142
10	State of Modernization	0.171	0.0346
* Significant at 5% level of significance			

Relationship between Personal, Socio-economic Characteristics and Adoption Level of Trained Farmers

A cursory look at Table 3 clearly indicated that relationship of adoption level with the socio economic characteristics i.e., education, land holding, experience in farming and social participation were significantly associated. Obviously education, land holding, experience in farming and social participation have helped the farmers to acquire knowledge for better adoption and exposed to new technologies and their urge to know the new things in agriculture which have significantly contributed in adoption. Other variables namely age, family size, annual income, sources of information, economic motivation and state off modernization were not significantly related to the adoption level of respondents.

Conclusion

The study reveals vast scope for the Developmental Departments to intervene and improve the adoption level of farmers about agricultural practices. It can be concluded from above findings that majority of the respondents belonged to medium level of adoption regarding recommended agricultural practices in paddy cultivation. Though, the paddy is cultivated by all the farmers in the study area but their scientific knowledge about the recommended practices in paddy crop is still in infancy stage. Hence it is imperative that State Department of Agriculture, University of Agricultural Sciences and other NGOs should make integrated and concerted extension efforts to provide required knowledge about recommended Paddy Production Practices to the paddy growers.

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