

# Dynamics of Adoption of Recommended Rice Production Technologies among Migrant Farmers

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## Introduction

Migration is a complex social process and is symptomatic of basic economic and social change. Ever since the inception of the green revolution and irrigation development in certain areas, rural to rural migration has increased particularly during the last four decades. The increased inflow of migrant farmers has far reaching socio-economic implications, as well as the overall agricultural development of the region, which warrant scientific investigation. It is recorded that in India, rural to rural migration is 59.30 per cent whereas rural to urban, urban to urban and urban to rural migration are 21.20, 12.95 and 6.25 per cent, respectively. In Karnataka it is 55.00, 20.50, 32.50 and 8.20 per cent, respectively. Among intra-district, inter-district and inter-state migration in both India and Karnataka, intra-district migration is leading with 63.5 and 57.95 per cent, respectively (Patil, 1991). The push factors such as floods, droughts, natural calamities, poverty and indebtedness (economic factors), and strained relations (social factors) also cause migration (Gupta and Bhakoo, 1980; Gupta, 1991 and Kishore kumar and Bijimolbaby, 1997).

The major focus of past studies has been on industrial and other migrants who converged to big cities or metropolis in expectation of wage employment. Little attention has so far been paid to investigate urban to rural and rural to rural migration. Thus, a study on migrant farmers was felt necessary in the present context. Knowledge about this would help us understand how far these migrant farmers have contributed to the improvement of agriculture in this area. As such the present study was taken up on the adoption level of recommended practices in paddy cultivation and to understand the socio-economic characteristics influencing the adoption behavior of migrant farmers.

## Methodology

The study was conducted in Raichur district of Karnataka. The district was purposively selected for the study as it has a predominant number of farmers who migrated from

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Andhra Pradesh. The major crops of the district are rice, cotton, sorghum, sugarcane and groundnut. The district has nine taluks, of which the Gangavathi taluk was purposively selected as it had the maximum number of migrant-farmers.

A list of all the villages in Gangavathi taluk was prepared. From the list, villages having camps of migrant farmers were retained. Thus 34 villages having camps were considered. A list of Andhra migrant farmers was prepared for each of the three camp villages selected for the study. From each selected village, 50 migrant farmers were selected randomly. The total sample size for the study was 150 migrant farmers.

The data was collected using a semi-structured interview schedule. The data thus collected was analysed using statistical tools such as frequencies, mean, standard deviation and correlations.

## **Results and Discussion**

The findings of the study and the discussion that flows from the results are mentioned here.

### **Age**

The results furnished in table 1 indicate that a majority of the respondents were middle aged. Farmers of middle age are usually enthusiastic, matured in farming and have more work efficiency than older and younger farmers.

### **Education**

The results revealed that about 14.67 per cent of the respondents were illiterate, whereas, 18.0 per cent had education up to middle school, 14.67 per cent had up to high school and not even a single individual among the respondents had completed graduation. Non-realisation of the importance of formal education in one's development by illiterate parents might not have motivated them to educate their children, who were the respondents of the present study. The respondents have migrated from their native place and settled at the new place taking up farming, they had poor economic condition at their native place and have now purchased large land holdings by selling their small holdings at their native place, and hence they expect their children to assist on the farm.

### **Family Type**

It was revealed that a majority of the respondents (60.67 per cent) had nuclear families, whereas 39.33 per cent had joint family. Basically, the respondents being migrant farmers, who possessed small land holdings at their native place had separated

from the joint families and established themselves at the new place by buying large land holdings due to their relatively low selling price thus forming a nuclear type of family.

### Family Size

The information about family size showed that 74.0 per cent of the respondents had 1 to 5 members in their family and only 26.0 per cent respondents had families with 6 members and above. This might be due to the realisation of the advantages of small families for a comfortable life.

### Land Holding

Majority of the respondents (46.67 per cent) possessed large land holdings followed by 29.33 per cent who had small land holdings. The possible reason that could be attributed is that the respondent's main family occupation being agriculture, they are entirely dependent on land for their livelihood. The migrant farmers who had smaller land holding at their native place with high land cost have migrated to the study area where they could buy large land holdings due to their low cost. Through their hard work the migrant farmers might have reaped higher yields. Thus with the earned money, the migrant farmers might have invested the earned money in purchasing land (Table 1), thus establishing themselves well at the place of destination.

### Agricultural Material Possession

Majority of the respondents' families possessed improved agricultural implements such as sprayer (89.33 per cent) and cart (76.0 per cent). Only those who were economically well off possessed these equipments in spite of their high cost. Another possible reason could be the regular need for these implements which might have compelled them to own these implements. They might have felt the importance of timely operations and

**Table 1: Socio-economic Characteristics of Andhra Migrant Farmers**

Sl.No.	Particulars	Respondents (%)
1.	<b>Age</b>	
	Less than 30 years (Young)	1.33
	Between 31-50 years (Middle)	55.33
	More than 50 years (Old)	43.33
2.	<b>Education</b>	
	Illiterate	14.67
	Can read only	6.0
	Can read and write	20.0

	Primary school	26.67
	Middle school	18.0
	High school	14.67
3.	<b>Family type</b>	
	Nuclear family	60.67
	Joint family	39.33
4.	<b>Family size</b>	
	Up to 5 members	74.0
	Above 6 members	26.0
5.	<b>Land Holding</b>	
	Marginal farmers (less than 3.2 acres)	24.00
	Small farmers (3.2 to 7.2 acres)	29.33
	Big farmers (more than 7.2 acres)	46.67
6.	<b>Agricultural material possession</b>	
	1. Sprayer	89.33
	2. Cart	76.0
	3. Leveller / kunte	38.67
	4. Puddler	36.67
	5. Tractor	11.33
7.	<b>Non-Agricultural material possession</b>	
	1. Cycle	96.0
	2. Radio	81.33
	3. Television	64.0
	4. Motor cycle	28.0
	5. Car/jeep	1.33
8.	<b>Sources of information</b>	
	1. Neighbours	100.0
	2. Friends and relatives	99.33
	3. Radio	46.0
	4. Agricultural Assistant	45.33
	5. Newspaper	25.33
	6. Farm magazine	24.67
	7. Village leaders	20.00
	8. Television	10.00
	9. KVK	7.33

by experience must have felt the yield variations if operations are not carried out in time.

### **Non-agricultural Material Possession**

It is evident from table 1 that 81.33 per cent of the respondents possessed radio and 64.0 per cent of the respondents possessed television. This might be due to their special interest in knowing about the things going on around them and the situation at their native place, which was made possible through programmes in their mother tongue that were broadcast and telecast.

### **Sources of Information**

The data projected in table 1 indicates that a majority (cent per cent and 96.0 per cent) of the respondents used local sources like 'neighbours' and 'friends and relatives', respectively. Neighbours are easily accessible and they have more impact on adoption pattern. The strength of this impact might be due to certain mutual obligations between them in carrying out the farm operations. It might be due to more cohesiveness within their group than among outsiders, because of a feeling of insecurity since they are outsiders. Friends, relatives and neighbours were more trusted and were considered as sources of information.

It was also found that the non-local source i.e. Agricultural Assistant was considered as a source of information by a considerable per cent of respondents (45.33 per cent). Since he is the official, resourceful and reliable person for technical information and due to his regular and periodic contacts with the respondents, he was considered as a source of information. Table 1 also reveals that the television was used by only 10.0 per cent of the respondents as a source of information even though 72.0 per cent had a regular habit of viewing television (Table 2). This might be due to the reason that the respondents were using the media more for entertainment purpose than as a source of information.

### **Mass-media Participation of the Respondents**

The results in table 2 reveal that radio was the most common media that was possessed by a majority of the respondents (81.33 per cent). This might be due to the reason that a common man can easily afford to possess radio. The habit of listening to radio mainly depends upon individual interest. The interest in listening to the programmes in their native language might have influenced a majority of the respondents to listen to radio regularly (53.33 per cent).

**Table 2. Mass-media Participation of the Respondents**

Mass media	Subscribers		Non-subscribers		Reading habit					
	Number	%	Number	%	Regular		Occasional		Never	
					Number	%	Number	%	Number	%
News paper	36	24.0	114	76.0	80	53.33	31	20.67	39	26.0
Farm magazine	22	14.67	128	5.33	37	24.67	7	4.67	106	70.67
	Owners		Non-owners		Listening / viewing habit					
	Number	%	Number	%	Regular		Occasional		Never	
					Number	%	Number	%	Number	%
Radio	122	81.33	28	18.67	77	51.33	45	30.0	28	18.67
T.V.	96	64.0	54	36.0	108	72.0	32	21.33	10	6.67

Television is the most popular media, possessed by 64.0 per cent of the respondents; where as 72.0 per cent of the respondents had a regular habit of viewing television. One of the cheapest media of mass communication the news paper was subscribed by only 24.0 per cent of the respondents; however 53.33 per cent of the respondents had regular reading habit.

### Social Participation

The data in table 3 revealed that only 6.0 per cent of the respondents were members of the milk society and 1.33 per cent were office bearers. Three per cent of the respondents

**Table 3. Social Participation of Respondents (n=150)**

Sl. No.	Organisation	Member		Office bearer		Participation					
		Number	%	Number	%	Regular		Occasional		Never	
						Number	%	Number	%	Number	%
1.	Milk society	9	6.0	2	1.33	8	72.72	3	27.27	0	0.0
2.	Panchayat	5	3.33	0	0.0	4	80.0	1	20.0	0	0.0
3.	Youth club	3	2.0	1	0.66	4	100.0	0	0.0	0	0.0
4.	Co-operative Bank	3	2.0	1	0.66	4	100.0	0	0.0	0	0.0

were members of Panchayat and 2.0 per cent each of the respondents were members of youth club and co-operative bank. Majority of the members or office bearers participated regularly in the activities of these respective organisations. This implied that the whole sample of the study had low participation in social organisations. Since the respondents are migrant farmers, they hesitate in full involvement in the local organisations that are mainly dominated by local members.

### **Adoption Level of Rice Cultivation Practices of Migrant Farmers**

The results presented in table 4 indicate that a majority (77.33 per cent) of the respondents belong to 'medium' adoption level category with only 10.67 per cent in 'low' and 12.0 per cent of the respondents in 'high' level of adoption categories.

The reason for a majority of the respondents being in medium adoption category might be their medium level of knowledge. Knowledge is the basic pre-requisite for any individual to think of the pros and cons in making a decision to either adopt or reject a practice.

**Table 4: Distribution of Respondents based on their Adoption Level**

Sl. No.	Category	Percentage
1	Low (less than Mean - S.D.)	10.67
2	Medium (Mean - S.D. to $x + S.D.$ )	77.33
3	High (More than Mean + S.D.)	12.0

In the present study it was observed that the percentage of farmers in medium adoption category is higher than the percentage of farmers at medium knowledge level. This might be due to the fact that the sources of information in the present study were neighbours (100 per cent) and friends and relatives (96.0 per cent). These sources might have influenced their neighbouring farmers in adopting the practices, without much understanding about the rationale behind the recommended practice. Thus there were more farmers in the medium adoption category than medium knowledge category.

### **Adoption of Important Rice Cultivation Practices by Migrant Farmers**

Adoption of any technology in general and rice cultivation practices in particular depends on various factors such as awareness about practices, extent of change agent's efforts, complexity of practices, timely availability of inputs, characteristics of farmers etc. However, it is true that all the recommended practices would not be adopted to the same degree by all the members in a given social system.

All the respondents adopted recommended time of sowing and the season of transplanting. The reasons that may be attributed to the above finding are, sowing of rice in the first week of June is a more routine practice and is recommended, as a majority of the farmers are aware, and also because the canal irrigation water is available at this time.

In the present study it was observed that 94.66 per cent of the respondents had adopted the recommended variety. The plausible reason for this might be that the farmers in the present study were mainly big farmers (Table 1) and they were cultivating rice more for selling it commercially than for self-consumption. They might be going for improved recommended varieties as they fetch higher returns. Another possible reason might be that among all the improved practices, in any crop cultivation, variety is one factor, which stands out clearly because results can be observed in terms of higher yield. As a result, majority of the farmers adopted the improved varieties.

It was also observed that a majority of the farmers (81.33 per cent) were adopting the recommended seed rate per acre. The plausible reason for this trend might be that most of the respondents were convinced as to its profitability and practicability and felt that they would get assured income by making a small investment.

It is also evident from table 5 that a majority of the respondents (62.67 per cent) had adopted seed treatment with chemicals as per the recommendation. In the present study it was also found that the variables land holding, mass-media participation, social participation and sources of information had a positive and significant relationship with adoption behaviour of the respondents (Table 6) and majority of the respondents were big farmers (Table 1). The big farmers might have gone for seed treatment with chemicals as per the recommendation to get higher yields and as they produced for commercial purposes. Thus the above reasons might be the guiding factors for the adoption of seed treatment with chemicals by a majority of the respondents in spite of the cost involved.

Around 61.0 per cent of the respondents had adopted the recommended zinc application. The rice fields under canal irrigation may be deficit in micronutrients. The neighbours, friends and relatives who were the major sources of information in the present study and who were regular in zinc application, might have prompted other farmers to apply the zinc chemicals even though the latter have little knowledge about the symptoms of zinc deficiency.

It could be understood that the above simple technologies were relatively adopted to a greater extent as compared to complex technologies like salt water treatment, fertilizers to nursery, fertilizers to main field and plant protection which were either, not adopted completely by the farmers (salt water treatment) or over adopted as in case of fertiliser

applications and plant protection by a majority of farmers (Table 5). Lack of knowledge about; recommended quantity of chemicals for control of pests and diseases, chemical fertilizers for nursery and the main field might be the reason for adoption of other than the recommended quantities. It was interesting to note that inputs like fertilizers to nursery, fertilizers to main field (NPK) were over used than recommended. These migrant farmers have a perception that greater use of these inputs will have a positive effect on yield levels. Around seventy seven per cent were unable to adopt practices like FYM to nursery and 72.0 per cent partially adopted practices like FYM to the main field. They were wrongly compensating this non-adoption or partial adoption of FYM by the use of these costly inputs in large quantities.

Thus, it can be said that the respondents exhibited a differential trend with respect to adoption of paddy cultivation practices.

**Table 5: Adoption of important Paddy Cultivation Practices**

Sl. No.	Practices	Respondents		
		Adopted		Not At All Practiced
		As Recommended	Not as Recommended	
		Percent	Percent	Percent
1.	<b>Variety</b>	94.66	5.33	0.0
2.	<b>Seed treatment</b>			
	Salt water treatment	0.00	0.0	100.0
	Chemical treatment	62.67	0.0	37.33
3.	<b>Nursery management</b>			
	Time of sowing	100.0	0.0	0.0
	FYM to nursery	9.33	13.33	77.33
	Fertilisers to nursery			
	Nitrogen	0.00	98.67	1.33
	Phosphorus	0.00	94.67	5.33
	Potassium	0.00	90.67	9.33
	Area of nursery	30.67	67.33	0.0
	Seed rate	81.33	18.67	0.0
4.	<b>Transplanting</b>			
	Season	100.0	0.0	0.0
	Age of the seedlings	16.0	84.0	0.0

5.	<b>Manure application</b>			
	Organic manure to main field	28.0	72	0.0
	Green manuring			32.0
	Pillipesara	32.0	0.0	0.0
	Jeeluga	36.0	0.0	0.0
6.	<b>Fertilisers to main field</b>			
	Nitrogen	0.0	100.0	0.0
	Phosphorus	0.0	100.0	0.0
	Potassium	0.0	100.0	0.0
	Zinc application	60.67	39.33	0.0
7.	<b>Plant protection</b>	1.33	98.67	0.0

### Relationship between independent variables and Adoption Behaviour of the Respondents

The relationship between age and adoption level of the respondents was found to be positively significant ( $r = 0.4744^{**}$ ). The positive trend indicates that as age increases, the level of adoption of recommended paddy cultivation practices increases to a significant extent. The plausible reason for highly significant association might be that the farmers of the study area were involved in cultivating the crop since a long time and as the age increased, the experience gained in the cultivation also increased. Based on the experience over a period of time, they must have been replacing traditional practices with scientific recommended practices.

A positive and highly significant relationship was observed between education level and adoption of recommended cultivation practices ( $r = 0.6576^{**}$ ). It could be inferred that, higher the formal education, higher was the adoption of recommended practices. It is true that educated farmers readily recognise the importance of improved methods of cultivation and show willingness to adopt the same. Further, the educated have an added advantage of using print information, which is a potential medium in influencing the adoption behaviour of farmers. Thus, education helps in widening their mental horizon and facilitates learning by developing a favourable attitude towards adoption of new farm practices. It is also true that rationality in decision-making is a function of one's education level. And for adoption of innovations, decision-making is a key component since education helps the individual to analyse rationally the innovations thus helping him to take a correct decision to adopt an improved practice.

## Land Holding and Adoption

Table 6 emphasises the significant positive correlation between land holding and adoption level of the respondents. The plausible reason for the above finding might be that farmers having higher land holding status would also possess better socio-economic status, which enables them to invest in different specialised farm operations of modern agriculture. Higher land holding status operates through financial strength, leading to higher adoption of recommended practices. Possession of improved agricultural materials and greater risk bearing ability due to better socio economic status might have prompted the farmers to take up agricultural operations on a timely basis.

## Mass-Media Participation and Adoption

In the present study it was observed that mass-media participation and adoption level of the respondents had a highly significant relationship. This implies that farmers having wider exposure to mass media i.e., to radio and television, had adopted more number of practices.

Advent of mass media provides enormous opportunities for repeated exposure to new technology, motivating the farmers for further action. This phenomenon can be based on the theory of dissonance given by Festinger (1937). Increased exposure to mass media increases the degree of inequilibrium, which results in a state of dissonance. In order to maintain homeostasis, farmers try to adopt new farm practices at a faster rate. The mass-media sources also help the farmers to get an idea about economic advantage of the new technology and to consult experienced farmers who have already adopted new technology and other sources of information wherever they face difficulty in adopting new technology. When viewed from this angle, the present finding of the study confirms the general proposition that increased mass-media participation leads to increased adoption.

**Table 6: Relationship between the independent variables and Adoption Behaviour of the Respondents**

Independent Variable	Correlation Value 'R'
Age	0.4744**
Education	0.6576**
Land holding	0.3968**
Social participation	0.3868**
Mass media participation	0.4557**
Sources of information	0.3603**

\*\* Significant at 0.01 level of significance.

## **Social Participation and Adoption**

The relationship between social participation and adoption level of the respondents was highly significant and positive. However, the variable social participation exhibited a non-significant relationship with knowledge.

The plausible reason for the above finding might be that the respondents possessing high social participation would have adopted more number of practices as a result of increased interaction with other members and office bearers of the organisation, leading to the conviction of the farmers about the technologies that ultimately led to their adoption.

## **Sources of Information and Adoption**

In the present study the relationship between the sources of information and adoption behaviour of the respondents was highly significant. From the past research studies it was evident that among the five steps of adoption process i.e., awareness, interest, evaluation, trial and adoption, personal contact sources are more appropriate at adoption stage. It was noticed in the present study that the personal sources like neighbours, friends and relatives and agricultural assistant were the main sources of information for the respondents. So it is natural that these sources of information had influenced them for higher adoption. The farmers might have utilised radio and television for information purpose in addition to entertainment. Those farmers who have used mass-media for information might have a higher adoption rate.

## **Recommendations and Conclusion**

A majority (77.33 per cent) of the respondents belonged to medium adoption level category and only 10.67 per cent and 12.0 per cent of the respondents belonged to low and high adoption level categories, respectively. All the respondents had adopted the practices namely, time of sowing, and season of transplanting. Not even a single respondent adopted the practice salt-water treatment to seeds. Majority of the respondents had adopted the practices viz., variety (94.66 per cent), seed rate (81.33 per cent), chemical treatment to seeds (62.67 per cent), as recommended. It was also found that 68.0 per cent of the respondents had adopted green manuring. All the respondents expressed lack of knowledge as the single major reason for their non-adoption of the practices namely, fertiliser application to nursery, fertiliser application to main field, and salt-water treatment. Non-availability of water in time for irrigation and non-availability of labour were the main reasons (82.67 per cent and 76.0 per cent respectively) given by the respondents for the non-adoption or partial adoption of practice 'recommended age of seedlings'. The variables age, education, land holding, social participation, mass-

media participation and sources of information had a positive and significant relationship with adoption level of paddy cultivating Andhra migrant farmers.

Based on the above findings of the study, the following recommendations are made.

1. Extension efforts should be directed to increase the knowledge and adoption level of farmers regarding improved cultivation practices of rice.
2. There is need to teach the skills of complex practices like split dose application of fertilizers, salt water treatment, as there was low level of adoption in respect of these practices. Suitable extension teaching methods need to be taken up.
3. In the present study it was found that the practices like fertilizer and pesticide applications that are very important to harvest good yields were not adopted as per the recommendation. Hence there is need to concentrate on extension efforts for educating rice farmers about these practices.
4. For most of the practices, majority of the respondents had given the reasons like lack of knowledge, non-availability of inputs, non - availability of labour, and irrigation water in time for their non adoption and partial adoption of cultivation practices. In this context, there is need to take suitable measures to overcome these constraints and enable the rice farmers to adopt improved practices and thereby increase land productivity.
5. It was noticed that the variables like education, mass-media participation, social participation and sources of information had a positive and significant association with the adoption behaviour of the respondents. Therefore, it is necessary to improve upon these factors of migrant farmers in the area to make them more innovative and to take up new farm practices. The programmes of literacy and other communication facilities might improve some of these factors.

Further, the extension workers should utilize these migrant farmers to channelise information on new farm practices since they have already taken lead in the area to put many agricultural innovations into action as well as influence others. Organised farm leader's training programmes using these people might enhance these effects.

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