

# IMPACT OF RICE MINIKIT TRIALS ON THE ADOPTION BEHAVIOUR OF FARMERS

BY

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COLLEGE OF AGRICULTURE  
VELLAYANI  
THIRUVANANTHAPURAM  
1992

Dedicated  
to the loving memory of  
Sasi Annan

CERTIFICATE  
DECLARATION

I hereby declare that this thesis entitled, "Impact of Rice Minikit Trials on the Adoption Behaviour of Farmers", is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship or other similar title of any other University or Society.

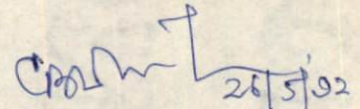
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# ***INTRODUCTION***

## 1. INTRODUCTION

The agricultural scene in the country has been plagued by the threat of ever increasing population. The challenge of feeding this proliferating millions has been made possible through the Green Revolution, the success of which hinged much upon the advent of high yielding varieties of food crops mainly rice and wheat.

The traditional extension methods were found inadequate, if not obsolete, for the spread of these high yielding varieties evolved as a result of the stupendously rapid progress achieved in rice breeding. For a massive impact of the new technology on rice production a fast approach was necessary to transfer the technology to the farmers' fields.

It was with this objective in mind that the Rice Production and Applied Research Unit in IRRI developed a new extension technique namely Minikit Trials Programme in 1968. In India, the programme was introduced during 1968 itself and is in vogue even now.

Despite substantial improvement in productivity, rice production in Kerala has been stagnating at around 10 to 11 lakh tonnes during the first half of eighties. This was mainly due to the fact that the improvement in

productivity had been more than offset by the decline in area under the crop during the period. This was mainly because of the widening disparities in the net income of rice vis-a-vis other competing crops like coconut, banana etc. The surging pressure exerted by the more rewarding crops resulted in a continuous shift in area from rice cultivation to other crops.

Though the productivity of rice reached an all time record of 1956 kg in 1989-90, (Govt. of Kerala, 1990), attaining self-sufficiency in this vital aspect still remains a far cry. The overall coverage under high yielding varieties of rice has been only around 30 per cent of the area under rice. The scope for securing further increase in rice production lies largely in achieving higher coverage of high yielding varieties during all the three seasons.

To this end, Minikit Trials Programme is being implemented in all the districts of Kerala state from 1968 onwards. Being the staple food crop, rice is accorded priority in these trials in the Kerala state.

#### Need for the study

During 1989-90 a total of 26920 Rice Minikit Trials were conducted in the state. Yet no systematic and



objective research study evaluating the impact of Rice Minikit Trials in the state has been conducted so far albeit studies from other states by Swaminathan (1986) in Tamil Nadu on Pulse Minikit Trials, Sankaran(1987) also in Tamil Nadu on Groundnut Minikit Trials and Goswami(1988) in Uttarpradesh on Wheat Minikit Trials have been reported.

Such studies would help to determine the impact of Minikit Trials through the reactions and responses of the participant and the non-participant farmers towards these trials, the varieties involved and the procedures followed while conducting these trials so as to engender suitable alterations in attempting to streamline the programme in better directions.

So it was with this intention that a study was designed to evaluate the impact of Rice Minikit Trials Programme on the adoption behaviour of farmers, with the following specific objectives:

1. To assess the impact of Rice Minikit Trials on the adoption behaviour of the participant and the non-participant farmers.
2. To examine the influence of various characteristics of farmers on the adoption behaviour.

3. To analyse the perception of the participant and the non-participant farmers about the innovation-characteristics of Minikit Rice Varieties.
4. To evaluate the procedures followed in conducting Rice Minikit Trials.
5. To study the constraints faced by the participant farmers and the extension personnel in conducting Rice Minikit Trials.

#### Limitations of the study

Since the study is of ex-post-facto design, the memory bias on the part of the respondents could not be overruled. Though the Minikit Trials are being conducted in all the districts of Kerala, due to the limitation of both resources and time, it was rather impossible to cover all these districts and hence the study could be done only in one district. However sincere efforts were taken to make the study as systematic and objective as possible.

# ***THEORETICAL ORIENTATION***

## 2. THEORETICAL ORIENTATION

A review of previous works either theoretical or empirical may assist in the delineation of new problem areas and may provide a basis for developing a theoretical framework for the study. It helps to understand where the society including the researcher stands in understanding the particular research problem. It also helps to operationalise variables enabling data collection on the problem under investigation.

In accordance with the objectives of the present study the theoretical orientation is furnished on the following lines.

1. Concept of Rice Minikit Trials Programme.
2. Impact of Minikit Trials on the adoption behaviour of farmers.
3. Farmers' characteristics contributing towards the impact of the Rice Minikit Trials in terms of adoption of recommended practices.
4. Perception about the innovation-characteristics of the Minikit varieties of rice by the participant and the non-participant farmers.
5. Evaluation of the procedure followed in conducting Rice Minikit Trials.

6. Constraints experienced by the farmers in conducting Rice Minikit Trials.
7. Theoretical concepts and operational definitions of the selected variables and
8. Hypotheses formulated for testing in the study.

#### 1. Concept of Rice Minikit Trial Programme

The concept of Rice Minikit Trial could be well understood if its objectives initially set by the Rice Production and Applied Research Unit of IRRI in 1968, are carefully studied.

The programme envisaged the following objectives.

1. To enable the farmers as well as extension personnel to determine suitable varieties and package of practices.
2. Farmers' participation in varietal choice.
3. Multiplication of suitable varieties.
4. Quick spread of new varieties.
5. Wide contact with farmers and
6. Increased production.

The details of the programme as being followed now in India are presented below.

According to Government of India (1989), this is a centrally sponsored programme aimed at the popularisation of location-specific high yielding varieties of rice and the conduct of demonstration of pre-release varieties.

Each minikit consists of 4 kg of either pre-release or recently released high yielding variety rice seeds. In Kerala, only transplanting type of varieties are being supplied. The kits also contain a leaflet on the package of practices of cultivation of the variety. The kits are distributed to the selected farmers at a nominal charge of Re.1/-.

It is the duty of the extension personnel to ensure that only certified seeds are supplied. The trials are to be conducted in fields of the identified farmers under the guidance and supervision of the extension personnel.

According to the instructions promulgated by the Govt. of Kerala (1989) participants must be identified with the help of the Karshika Vikasana Samithy in the area. While selecting the participants preference must be given to small and marginal farmers who have not taken part in the programme earlier.

The names of the selected farmers are to be entered into a register and a list of their names has to be displayed in the Krishi Bhavan.

The farmers are asked to cultivate the variety supplied, along with the main variety they are cultivating, but in a separate plot. Treatments for both the varieties must be identical. The main variety is considered as a check variety.

The results of the trial are to be promptly recorded by the extension personnel in the "farmers' reaction card".

2. Impact of Minikit Trials on the adoption behaviour of farmers.

Impact of Minikit Trials forms the focal point of the study. Only very few closely related studies could be obtained in this regard. They are reviewed below.

Swaminathan (1986) studying the impact of the Pulse Minikit Demonstrations on the adoption behaviour of farmers indicated that high level of adoption of recommended pulse practices was observed only in the case of the participant farmers, majority of whom belonged to medium to high extent of adoption.

While making a study on the impact of Groundnut Minikit Trials Programme on knowledge and adoption of Groundnut technology, Sankaran (1987) observed significant difference in the extent of adoption between beneficiaries and non-beneficiaries.

Goswami (1988) evaluating the benefits of Wheat Minikit Programme in Uttar Pradesh observed that the level of adoption of new technology in many areas was unsatisfactory.

In its special study on the impact of Minikit of Pulses and Oil seeds, Government of Kerala (1988) reported that majority of the participant farmers under the programme had adopted the recommended practices like plant protection measures and fertilizer application.

The above studies revealed that the Minikit Trials have shown varying levels of impact on the adoption behaviour of farmers.

### 3. Farmers' characteristics contributing towards the impact of the Rice Minikit Trials in terms of adoption of the recommended practices

The impact of Rice Minikit Trials in terms of adoption of recommended practices was conceptualised as being influenced by a number of factors such as socio-economic status, extension orientation, cosmopolitaness, mass media participation, scientific orientation, crop yield index, and management orientation. In the absence of direct studies examining the influence of such characteristics on the impact of Rice Minikit Trials in terms of adoption of



recommended practices, the results of other closely related studies available on these lines have also been organised and presented as follows.

### 3.1. Socio-economic status

The following studies have shown positive and significant relationship between socio-economic status and adoption behaviour of farmers.

Sl.no.	Author	Year
1	Kamble	1973
2	Vellapandian	1974
3	Supe and Salode	1975
4	Somasundaram	1976
5	Vijayaraghavan	1977
6	Chandrasekharan	1979
7	Pathak <u>et al</u>	1979
8	Manivannan	1980
9	Prakash	1980
10	Ravichandran	1980
11	Naik	1981
12	Sushama <u>et al</u>	1981
13	Voh	1982
14	Vijayakumar	1983
15	Cherian	1984

16	Jayakrishnan	1984
17	Sangle	1984
18	Sreekumar	1985
19	Lakshmanan	1987
20	Mahadevaiah	1987
21	Ramegowda and Siddaramaiah	1987
22	Rameshbabu	1987
23	Syamala	1988
24	Anithakumari	1989
25	Sajeevchandran	1989
26	Kumar and Waswik	1990
27	Satheesh	1990
28	Bhoite and Girase	1991
29	Grewal and Sohal	1991

A few studies revealed a non-significant relationship between socio-economic status and adoption behaviour. They are given below.

Sl.no.	Author	Year
1	Mathew	1980
2	Godhandapani	1985
3	Olowu <u>et al</u>	1988
4	Chandargi. <u>et al</u>	1991

Based on the above studies, it was assumed that socio-economic status would influence the adoption behaviour of participant as well as non-participant farmers and hence this variable was included in the study.

### 3.2. Extension orientation

The relevant studies showing positive and significant relationship between extension orientation and adoption behaviour are summarised below.

Sl.no.	Author	Year
1	Jha and Sharma	1972
2	Bhaskaran	1979
3	Manivannan	1980
4	Ogunfiditimi	1981
5	Swaminathan	1986
6	Dudhani <u>et al</u>	1987
7	Sankaran	1987
8	Goswami	1988
9	Gowd	1988
10	Krishnamoorthy	1988
11	Olowu <u>et al</u>	1988
12	Reddy and Reddy	1988
13	Singh <u>et al</u>	1988
14	Syamala	1988
15	Rajagopal	1990
16	Hanchinal <u>et al</u>	1991

But some of the studies, as given below, indicated that extension orientation had non-significant relationship with adoption behaviour.

Sl.no.	Author	Year
1	Chandrasekharan	1979
2	Godhandapani	1985
3	Swaminathan	1986
4	Balan	1987
5	Sheoran and Kumar	1988
6	Bhoite and Girase	1991

The interesting results of the above studies necessitated to find out the kind of relationship between extension orientation and adoption behaviour of farmers in the present exploration.

### 3.3 Cosmopolitaness

The review of studies available showing positive and significant relationship between cosmopolitaness and adoption behaviour is presented below.

Sl.no.	Author	Year
1	Anbalagan	1974
2	Karim and Mahboob	1974
3	Ariffin	1975
4	Vijayakumar	1983

5	Mahadevaiah	1987
6	Ramegowda and Siddaramaiah	1987
7	Olowu <u>et al</u>	1988

But a few authors reported the relationship between cosmopolitanness and adoption behaviour as non-significant. They are

Sl.no.	Author	Year
1	Vijayaraghavan	1977
2	Thankaraju	1979
3	Kamarudeen	1981
4	Viju	1985
5	Syamala	1988

It was decided to test the validity of these results in the present investigation also and hence this variable was selected.

#### 3.4. Mass media participation

The following studies indicated positive and significant relationship between mass media participation and adoption behaviour of farmers.

Sl.no.	Author	Year
1	Singh and Singh	1970
2	Vellapandian	1974

3	Mahadevaswamy	1978
4	Bhaskaran	1979
5	Ravi	1979
6	Balasubramanian	1980
7	Manivannan	1980
8	Sohi and Kherde	1980
9	Haraprasad	1982
10	Sanoria and Sharma	1983
11	Hirevenkanagoudar <u>et al</u>	1984
12	Lakshminarayanan	1984
13	Balasubramaniam	1985
14	Godhandapani	1985
15	Mishra and Jha	1985
16	Swaminathan	1986
17	Burns	1987
18	Sankaran	1987
19	Reddy	1989
20	Jaiswal and Sharma	1990
21	Satheesh	1990
22	Umale <u>et al</u>	1991

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But the following studies revealed non significant relationship between mass media participation and adoption behaviour.

Sl.no.	Author	Year
1	Rajendran	1978
2	Chandrasekharan	1979
3	Tyagi and Sohal	1984
4	Nanjayan	1985
5	Swaminathan	1986
6	Sheoran and Kumar	1988
7	Syamala	1988

In view of the results of the above studies, it was decided to test the relationship between mass media participation and adoption behaviour of farmers.

### 3.5. Scientific orientation

Various studies which concluded positive and significant relationship between scientific orientation and adoption behaviour are given below.

Sl.no.	Author	Year
1	Beal and Sibley	1967
2	Reddy and Kivlin	1968
3	Supe and Salode	1975
4	Somasundaram	1976
5	Palaniswamy	1978
6	Thankaraju	1979

7	Manivannan	1980
8	Aristotle	1981
9	Jayakrishnan	1984
10	Jayapalan	1985
11	Krishnamoorthy	1985
12	Nanjayan	1985
13	Wilson and Chaturvedi	1985
14	Prasannan	1987
15	Reddy and Reddy	1988
16	Anithakumari	1989
17	Sajeevchandran	1989
18	Umale <u>et al</u>	1991

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But Sakthivel (1979) found the relationship as non significant while Swaminathan (1986) supported the finding only in the case of participant farmers.

Since majority of the studies revealed positive and significant relationship between scientific orientation and adoption behaviour, it was decided to include this variable also in the present study.

### 3.6. Crop yield index

All the studies reviewed, as presented below, revealed significant relationship between crop yield index and adoption behaviour of farmers.



Sl.no.	Author	Year
1	Channegowda	1971
2	Sinha and Kotle	1974
3	Samantha	1977
4	Ramalingagowda	1978
5	Bhaskaran	1979
6	Rannorey	1979
7	Sreekumar	1985
8	Mahadevaiah	1987
9	Syamala	1988

Thus it would be of use to test the validity of the above results in the present investigation.

### 3.7. Management orientation

The following studies indicated positive and significant relationship between management orientation and adoption behaviour of farmers.

Sl.no.	Author	Year
1	Samantha	1977
2	Shanmukhappa	1978
3	Bhaskaran	1979
4	Sheshachar	1980
5	Kamarudeen	1981

6	Thimmappa	1981
7	Renukaradhya	1984
8	Sreekumar	1985
9	Ramesh babu	1987
10	Syamala	1988
11	Saed	1989

Contradictory results in this regard were reported by the following authors.

Sl.no.	Author	Year
1	Ansari	1979
2	Bhat	1980
3	Nidajundi	1981
4	Al-Mozel	1985

It would be interesting to test the way in which this variable would influence the adoption behaviour of farmers in the present context and hence this variable was also selected.

4. Perception about the innovation-characteristics of the Minikit Varieties of Rice.

All innovations cannot be regarded as similar or equivalent in their capacity to induce adoption (Coughenour 1965). Barnett (1953) in this connection stated "the

reception given to a new idea is not so fortuitous and unpredictable as it sometimes appears to be". The character of the idea itself is an important determinant. The properties of a given idea act as stimuli and their perception by an individual influences his behaviour (Rogers, 1983).

Bohlen and Beal (1960) postulated that an individual's response or action is the result of perception of the stimulus which implies the behaviour as motivated by a stimulus.

Rogers and Shoemaker (1971) stated that it is the receiver's perception of the attributes of innovations that affects their rate of adoption. The innovation-characteristics can be perceived differently by different individuals.

A review of studies conducted on the innovation-characteristics perceived to be significantly related to rate of adoption is presented below.

Sl.no.	Author	Year	Innovation-characteristics
1	Salwi and Pawar	1966	Profitability, compatibility, efficiency and feasibility
2	Jaiswal and Roy	1968	Profitability, cost, physical compatibility, cultural compatibility, complexity and communicability
3	Mulay and Roy	1968	Simplicity, complexity, cost profitability, compatibility
4	Singh and Babu	1968	Profitability
5	Nair	1969	Profitability
6	Singh	1969	Cost, divisibility and complexity
7	Perumal	1970	Cost, profitability
8	Rao	1970	Profitability, compatibility and complexity
9	Rogers and Shoemaker	1970	Relative advantage, compatibility, trialability, observability and complexity
10	Choukidar and George	1972	Taste, keeping quality and cooking quality of High Yielding varieties of paddy
11	Viswanathan	1972	Compatibility, cost, labour
12	Ernest	1973	Profitability, labour
13	Ramamoorthy	1973	Complexity
14	Ambalagan	1974	Profitability, cost
15	Ramachandran	1974	Profitability
16	Sharma and Nair	1974	Complexity, cost, profitability, suitability and labour
17	Arifin	1975	Relevance to the situation

18	Momi and Sohal	1975	Risk, compatibility and complexity
19	Arulraj and Knight	1977	Cost and profitability
20	Zuckerman	1978	Threshold level of cash returns
21	Sakthivel	1979	Profitability
22	Brady	1980	Profitability
23	Singh and Singh	1980	Profitability
24	Ashby	1982	Suitability
25	Subramani	1982	Yield, suitability
26	Arulraj	1984	Managerial feasibility, use complexity, flexibility content complexity, physical feasibility, labour efficiency and physical compatibility
27	Ramegowda and Siddaramaiah	1987	Profitability, compatibility, Trialability and observability
28	Hanchinal <u>et al</u>	1991	Suitability, economic advantage, non-riskiness and trialability

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Majority of the studies reported profitability as the most important innovation-characteristic influencing adoption in a significant way. But as Rogers (1983) pointed out, a controversy regarding the relative importance of profitability over other perceived innovation-characteristics can also be traced. To argue that the economic factors are the sole predictors of rate of adoption may be ridiculous. So in the present study, in addition to profitability other

important innovation- characteristics such as complexity, suitability, cost and labour requirement are also included.

5. Evaluation of the procedure followed in conducting Rice Minikit Trials

Since no direct study in this regard could be obtained, a few closely related studies are furnished below.

Somasundaram (1970) analysed the importance and purpose of composite demonstrations as perceived by farmer-demonstrators and found that their understanding of the purpose of demonstrations was not adequate. He also found that preparation and use of the calendar of work was not common. Supervision was not systematic, pre-planned and purposeful. Little attention was given to follow-up.

Balar and Patel (1973) analysed the procedures and techniques followed in conducting National Demonstrations and reported that the extent of attempt made by the organizers for the publicity of demonstrator-farmers and National Demonstration plots was very low. The publicity efforts seemed to be inadequate and the results of National Demonstrations were not given any publicity. The selection of demonstrator-farmers was quite satisfactory and selection of plot sites was appropriate. They further observed that in general there was lack of co-ordination between

demonstration organizers, extension agency, local leaders and institutions. No proper visits, educational tours, field days etc. were organized for the benefit of the farmers. No systematic follow up of the programme was undertaken.

Nandakumar (1980) reported that majority of the participants were satisfied with the working conditions of Drought Prone Area Programme.

Duraiswami (1981), making a beneficiary analysis of the IRDP, found majority of small and marginal farmers were satisfied with the services rendered.

While making an evaluation of Minikit Programme in wheat, Goswami (1988) indicated that there was little co-ordination among the officials at different levels of execution. He also reported that the officials did not strictly follow the criteria in the selection of beneficiaries and the follow up in most of the cases was not adequate.

An evaluation of the procedures followed while conducting any agricultural development programme is a sure indicator of its effectiveness. It would also bring out the lapses, if any, on the side of the extension machinery in

attaining the objectives of the programme. Therefore, it was decided to make an attempt to evaluate the procedures followed in the conduct of the Rice Minikit Trials.

6. Constraints felt by participant farmers and extension personnel while conducting Rice Minikit Trials

In the absence of direct studies on this aspect, a few closely related studies are reviewed here.

Kaleel (1978), studying the impact of intensive paddy development programme, reported non-availability of inputs in time as the most important constraint felt by farmers.

Pathak et al (1979) listed the problems reported by the demonstration farmers and non-demonstration farmers as 1) lack of timely supply of inputs, 2) lack of irrigation facilities, 3) lack of working skill in the farmers, 4) lack of technical assistance, 5) lack of credit facilities and 6) unavailability of spare-parts of implements.

Tripathy et al (1982), analysing the constraints in the adoption of High Yielding Rice Technology reported that poor germination percentage of government supplied seeds and not demonstrating the improved techniques sufficiently were the main hurdles faced by farmers.



Waghmare and Pandit (1982) found lack of knowledge, lack of technical guidance and high cost of chemical fertilizers as the important constraints on adoption of wheat technology by tribal farmers of Madhya Pradesh.

Ramanathan et al (1987) reported that high cost of cultivation, non-availability of planting material in time and better performance of local varieties under poor management were acting as constraints in the adoption of High Yielding cassava varieties.

Sankaran (1987), studying the impact of Minikit Programme on knowledge and adoption of groundnut technology, listed the following constraints as experienced by the participant and the non-participant farmers. 1) failure of seasonal rains, 2) inadequate supply of inputs, 3) non-availability of inputs, 4) fluctuations in market price, 5) high cost of cultivation, 6) difficulties in availing credit, 7) more pests and diseases attack, 8) non-availability of labour during peak season and 9) high cost of labour.

Goswami (1988), evaluating the benefits of Minikit Programme in wheat, reported that lack of timely supply of kits and inadequate field trials were considered as the major constraints by participant farmers and extension personnel, respectively.

Reddy (1988) reported lack of conviction about improved technology as the major constraint in adopting dry land technology in Andhra Pradesh.

Syamala (1988) found that lack of follow-up, training conducted not based on farmers' needs, and field days conducted not appropriate were the most-felt constraints by farmer demonstrators.

Kunju (1989) reported that the susceptibility of improved rice varieties to pests and diseases, followed by the need for heavy doses of fertilizers and pesticides and poor cooking quality as the major constraints in the Transfer of Technology of rice varieties released by the Kerala Agricultural University as perceived by the client, extension and input sub-systems.

Prakash (1989) identified small sized holdings, high wage rate, incidence of pests and diseases and non-availability of inputs in time as the major constraints in rice cultivation.

Bhople et al (1991) identified the important constraints in adoption of dry land practices under the four heads viz. situational, technical, economic and infrastructural.

Kumar and Singh (1991) identified the major constraints felt by marginal and small farmers in using fertilizers as poor economic condition, high cost of fertilizer and lack of knowledge.

Tantray and Nanda (1991) reported that the major constraints felt by rice farmers in employing the full potential of advanced technology were economic difficulties and lack of timely input availability.

The above studies indicate that the farmers have to face a number of problems while practising improved agriculture. So identification of constraints felt by the farmers in conducting the Rice Minikit Trials is included as an objective in the study. Though the number of studies analysing the constraints felt by the extension personnel are rare, an attempt is made in the present investigation to bring to light their difficulties in conducting the trials which it is hoped would help to suggest ways to improve the modus operandi of these trials.

## 7. Theoretical concepts and operational definitions of the selected variables

### 7.1. Impact of Minikit Trials

Swaminathan (1986) studied the impact of Pulse Minikit Trials in terms of adoption of recommended practices by participant and non-participant farmers.

Sankaran (1987) studied the impact of Minikit Programme in groundnut by analysing the adoption behaviour as well as knowledge level of the farmers in relation to the recommended cultivation practices.

Goswami (1988) also measured the impact of Wheat Minikit Trials in terms of adoption of recommended practices.

The impact of Rice Minikit Trials in this study has been analysed in terms of the adoption of recommended practices by the participant and the non-participant farmers.

### 7.2. Participant farmer

In this study a participant farmer is the farmer on whose field Rice Minikit Trial was conducted in Kharif, 1990.

### 7.3. Non-participant farmer

A non-participant farmer is the farmer on whose fields no Rice Minikit Trial was conducted in Kharif, 1990.

### 7.4. Adoption behaviour of farmers

Wilkening (1953) postulated adoption of an innovation as a process composed of learning, deciding and acting over a period of time.

Chattopadhyay (1963) considered adoption behaviour as a stage in the adoption process where decision making is complete regarding the use of a practice and actions with regard to such a decision commences.

Rogers (1983) defined adoption as the decision to make full use of an innovation as the least course of action available. It could be considered as an overt behaviour which is intended to accomplish some objective which in turn would satisfy or atleast reduce some need of the individual.

Arulraj (1984) conjured adoption behaviour as a decision and action to follow or use more number of practices within a shorter time from the awareness of existence of the same and for a longer time without discontinuance for the potential acreage according to recommendations made by competent scientific authority.

Leagans (1985) stated that adoption behaviour would be specific to particular innovations, individuals and environments. But there are some characteristics in general such as ;

1. It is an adult behaviour and as such idiosyncratic. Adoption behaviour varies as individual circumstances also vary.
2. Effect of communication ie what,why and how of the technical ideas is a component.
3. Traditional socio-economic factors such as size of farm,age,education,income,family size etc. generally influence the adoption of an agricultural innovation.
4. Socio-psychological factors significantly influence the adoption of an innovation.

In this study adoption is considered as the overt end action of using the selected recommended agricultural practices in the cultivation of Minikit Varieties of Rice.

#### 7.5. Perception

According to Crowe and Crowe (1956) perception is the meaningful sensation that assumes an important role in the life of an individual. It refers to the ways by which

the individual receives, interprets and responds to the stimuli picked by his sense organs.

According to Blalock (1963) perception has the following characteristics.

- 1) It is an individual matter. There may be as many different perceptions as there are individuals.
- 2) It involves not only perceiving stimuli but also interpreting and describing these stimuli in terms of that are meaningful to the individual.
- 3) Various internal and external factors may influence both the interpretation of the stimulus and the response it is likely to provoke and
- 4) It is a dynamic phenomenon that may be continually changing within the individual.

Theodorson and Theodorson (1970) defined perception as the selection, organisation and interpretation by an individual of specific stimuli in a situation according to prior learning activities, interest, experience etc.

Morgan (1986) defined perception as whatever experienced by a person.

Operationally perception is defined as the interpretation made by the participant as well as the non-participant farmers about the innovation-characteristics of Minikit Varieties of Rice.

#### 7.6. Socio-economic status

Socio-economic status is the position or status of an individual or a family in the society.

Chapin (1928) defined socio-economic status as the position an individual or a family occupies with reference to the prevailing average standards of cultural possessions, effective income, material possessions and participation in the group activities of the community.

Belcher (1951) found that the material possession items tended to be more staple indicators of socio-economic status than those dealing with social participation or cultural possessions.

For the present study socio-economic status is taken as a multi-dimensional concept referring to the respondents' occupation, land holdings, education, socio-political participation, possessions, house and house hold.



### 7.7. Extension orientation

Extension orientation is a cumulative function of extension contact and extension participation. It has been operationally defined in the study as the degree to which the respondent has contact with various extension personnel and participation in various extension activities.

### 7.8. Cosmopolitaness

According to Rogers and Svenning (1969), cosmopolitaness is the extent of contact with outside village such as visiting the nearest town, the purpose of visit and the membership in organisations outside the village.

Cosmopolitaness has been operationally defined in the study as the farmer's extent of contact with outside village such as visiting the nearest town, the purpose of visit and the membership in organisations outside the village.

### 7.9. Mass media participation

According to Gould and Kolb (1964), mass media are all the impersonal means of communication by which visual and/or auditory messages are transmitted directly to audience.

Mass media participation is operationally defined in the present study as the number and frequency of mass media information sources used or contacted by the respondents.

#### 7.10. Scientific orientation

According to Supe (1969), scientific orientation is the degree to which a farmer is oriented to the use of scientific methods in decision-making in farming. The same operational definition is adopted in the present study also.

#### 7.11. Management orientation

Following Samantha (1977), management orientation has been operationally defined as the degree to which a farmer is oriented towards scientific farm management comprising of planning, production, and marketing of his farm enterprises.

#### 7.12. Crop yield index

Crop Yield Index is the ratio of the per acre yield of major crops of the respondent to the average yield of those crops in the village, converted to percentage [Bhaskaran (1979)].

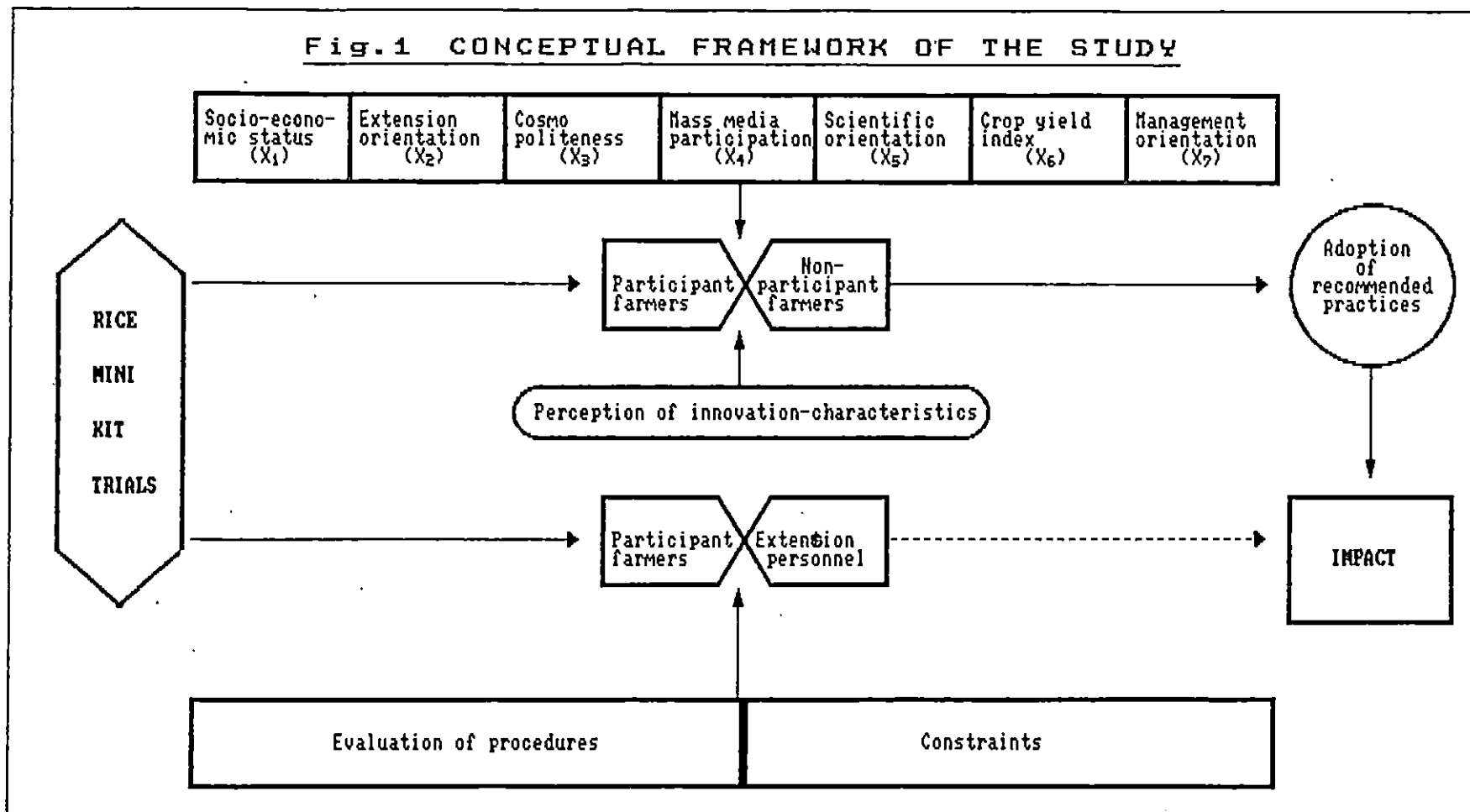
## 8. Hypotheses

Based on the theoretical orientation of the study and the review of available literature, the following null hypotheses were formulated.

- H<sub>0</sub>-1 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their socio-economic status.
- H<sub>0</sub>-2 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their extension orientation.
- H<sub>0</sub>-3 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their cosmopolitaness.
- H<sub>0</sub>-4 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their mass media participation.
- H<sub>0</sub>-5 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their scientific orientation.
- H<sub>0</sub>-6 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their crop yield index.

- H<sub>0</sub>-7 There would be no significant difference between the participant farmers and the non-participant farmers with respect to their management orientation.
- H<sub>0</sub>-8 There would be no significant difference between the participant farmers and the non-participant farmers in their level of adoption of recommended cultivation practices.
- H<sub>0</sub>-9 There would be no significant relationship between the selected characteristics of the participant farmers and their adoption of recommended cultivation practices.
- H<sub>0</sub>-10 There would be no significant relationship between the selected characteristics of the non-participant farmers and their adoption of recommended cultivation practices.
- H<sub>0</sub>-11 There would be no significant contribution of the set of selected characteristics in the variations in the level of adoption of the recommended cultivation practices by the participant farmers.
- H<sub>0</sub>-12 There would be no significant contribution of the set of selected characteristics in the variations in the level of adoption of the recommended cultivation practices by the non-participant farmers.

**Fig.1 CONCEPTUAL FRAMEWORK OF THE STUDY**



# ***METHODOLOGY***

### 3. METHODOLOGY

The materials and methods employed in this study are presented under the following sections.

- 1 . Location of the study
- 2 . Selection of the sample
- 3 . Selection of recommended cultivation practices
- 4 . Variables selected and their quantification
- 5 . Techniques employed in data collection
- 6 . Statistical methods used

#### 1. Location of the study

The study was conducted in Kollam District of Kerala State. During 1989-90 a total of 26920 Rice Minikit Trials were conducted in the Kerala State. While considering the ratio between the number of Rice Minikit Trials and the total area under rice in the 14 districts of the state, Kollam district emerged at the top and hence this district was selected as the locale of the study. The following table bolsters this fact.

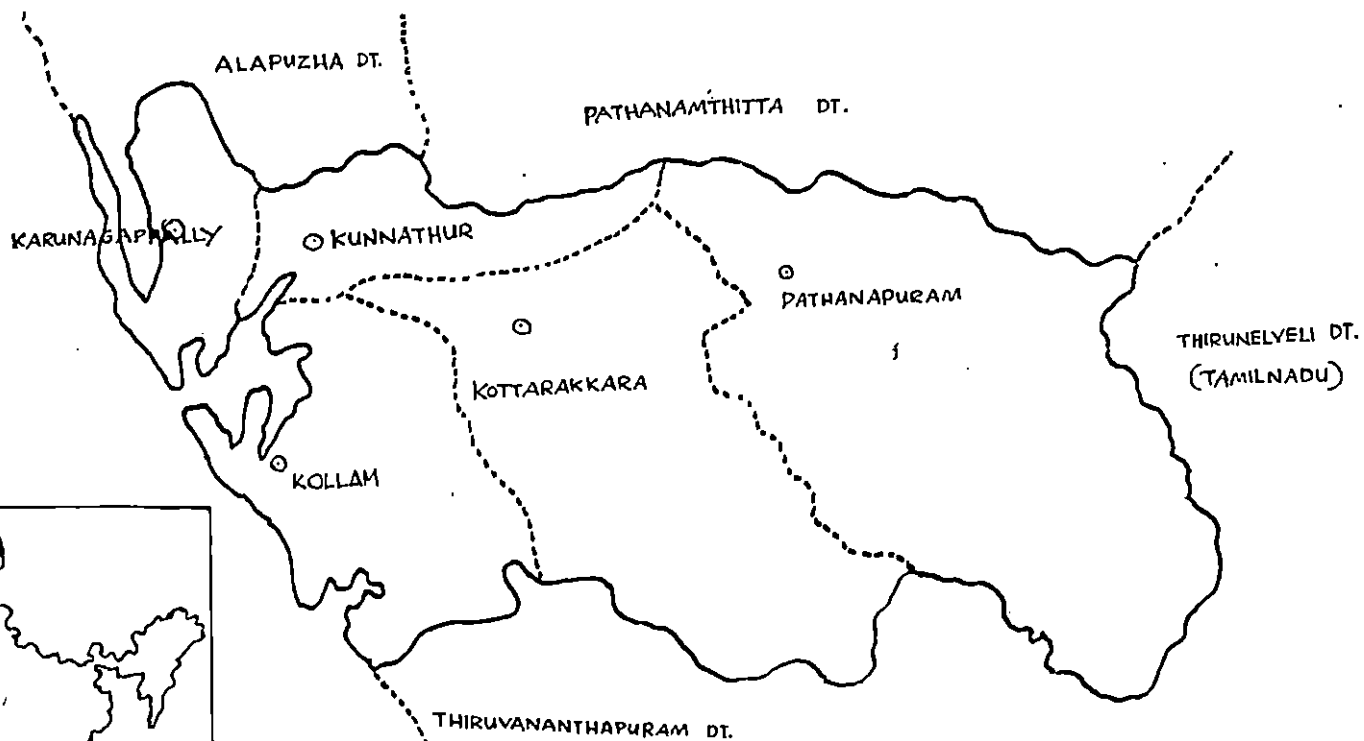
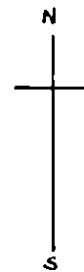
Table 1. Rice Minikit Trials conducted in the different districts of Kerala State during 1989-90 .

District	Number of Minikit Trials	Area (Ha) under paddy	Number of Minikit Trials
			Area (Ha) under paddy
Thiruvananthapuram	1578	25444	0.062
Kollam	3590	32824	0.109
Pathanamthitta	917	13130	0.069
Idukky	25	7085	0.003
Alappuzha	1129	67838	0.017
Kottayam	1024	33603	0.031
Eranakulam	3973	80817	0.049
Palakkadu	3000	154864	0.019
Thrissur	1532	89527	0.017
Malappuram	2210	62308	0.035
Kozhikkode	568	18123	0.031
Kannur	1732	26961	0.064
Wayanad	130	29999	0.004
Kasaragodu	170	21280	0.008

A map showing the location of the study is furnished in Figure 2.



FIG 2. MAP SHOWING THE LOCATION OF THE STUDY



## 2. Selection of sample

There are 74 Krishi Bhavans in Kollam district under two Agricultural subdivisions viz. Kollam and Kottarakkara. These Krishi Bhavans are primarily responsible for conducting the Minikit Trials. In all the Krishi Bhavan areas in Kollam district, Rice Minikit Trials were conducted during 1989-90.

From each agricultural subdivision 15 Krishi Bhavans were selected randomly. (The list of the selected Krishi Bhavans is given in Table 2.). From each Krishi Bhavan two farmers on whose fields Rice Minikit Trials were conducted in Kharif - 1990 (participant farmers) were selected randomly. Two rice cultivating farmers on whose fields no Rice Minikit Trials were conducted (non-participant farmers) from the corresponding Krishi Bhavans also were selected randomly. All the agricultural officers in charge of the selected Krishi Bhavans were also included as respondents of the study.

Thus the study had a total sample size of 150 respondents consisting of 30 Agricultural officers, 60 participant farmers and 60 non-participant farmers.

Table 2. List of the Krishi Bhavans selected

Name of subdivision	Name of Krishi Bhavans
I. Kollam	1.Chathannore
	2.Adichanellore
	3.Mayyanad
	4.Thrikkovilakom
	5.Kottangara
	6.Thrikkatavoor
	7.Chavara
	8.W.Kallada
	9.Panmana
	10.Karunagappally
	11.Mynagappally
	12.Ochira
	13.Thazhava
	14.Perinadu
	15.E.Kallada
II.Kottarakkara	1.Kottarakkara
	2.Neduvathoor
	3.Vettikkavala
	4.Kulakkada
	5.Chadayamangalam
	6.Kadakkal

7. Anchal
8. Pooyappally
9. Eroor
10. N. Pattazhi
11. Thalavur
12. Piravanthoor
13. Sasthamcottah
14. Suranadu
15. Poruvazhi

### 3. Selection of recommended cultivation practices.

Based on the popularity as common practices and the opinion of the Project Leader and subject matter specialists implementing the Trials, the following practices were selected.

1. Use of High Yielding varieties
2. Seed Treatment
3. Soil Testing
4. Lime application
5. Use of chemical fertilizers
6. Use of plant protection chemicals

#### 4. Variables selected and their quantification

Based on the specific objectives of the study and review of the past studies conducted, the following variables were selected for the study.

##### 1. Dependent variable

Adoption of the six recommended cultivation practices of paddy

##### 2. Independent variables

1. Socio-economic status
2. Extension orientation
3. Cosmopolitaness
4. Mass media participation
5. Scientific orientation
6. Crop Yield Index
7. Management orientation

3. Perception about the innovation-characteristics of Rice Minikit Varieties

4. Evaluation of the procedures followed in conducting the Rice Minikit Trials

5. Constraints experienced by the participant farmers and the extension personnel in conducting the Minikit Trials

The above variables were quantified by the following procedures.

1. Dependent variable

Adoption of the recommended cultivation practices

Different researchers have developed and used various methods to measure adoption behaviour.

Wilkening (1952) developed an adoption index, which was the percentage of new practices adopted by a farmer to the number of practices available to him.

Marsh and Coleman(1955) suggested an adoption ratio by taking into consideration area adopted and potential area.

$$\text{Adoption Ratio} = \frac{1}{N} \sum \frac{\text{area adopted}}{\text{area potential}} \times 100$$

where N=number of practices.

Dasgupta(1963) developed an adoption quotient by adding a new element viz. time.

Chattopadhyay(1963) developed a comprehensive scale called 'adoption quotient' by taking into consideration the extent of adoption, potentiality, applicability, time, consistency and differential nature of innovations.

Singh and Singh(1974) modified the scale developed by Chattopadhyay(1963) by taking only the two dimensions viz. extent and potentiality. According to this, the adoption quotient of each respondent was calculated by using the following formula.

$$\text{Adoption Quotient} = \frac{\sum e/p}{N} \times 100$$

where,

$\Sigma$  = the summation

e = extent of adoption of each practice

p = potentiality of adoption of each practice

N = total number of practices selected

Sankaran(1987), Goswami(1988) and Anithakumari(1989) used the same procedure in their studies.

In the present study, the method developed by Singh and Singh(1974) was used with slight modification. According to this method, a score of three was given for full adoption, two for incomplete or improper adoption and one for non-adoption.

In this method, the extent of adoption means the degree to which the respondent has actually adopted the selected practices. When the extent of adoption equals potentiality adoption is full and when it is nil it is considered as non-adoption.

Potentiality is the maximum degree to which the respondent can extend his adoption, if he so wills, depending on the maximum utilization of the resources he commands or can command.

The extent of adoption of each individual practice was calculated as follows.

1. Use of high yielding varieties

- |                                    |           |
|------------------------------------|-----------|
| 1. Minikit variety                 | score - 3 |
| 2. Any other high yielding variety | score - 2 |
| 3. Local variety                   | score - 1 |

2. Seed Treatment

- |                                       |           |
|---------------------------------------|-----------|
| 1. Proper seed treatment              | score - 3 |
| 2. Incomplete/improper seed treatment | score - 2 |
| 3. No seed treatment                  | score - 1 |



3. Soil Testing

- 1. Proper soil testing score - 3
- 2. Incomplete/improper soil testing score - 2
- 3. No soil testing score - 1

4. Liming

- 1. Proper liming score - 3
- 2. Incomplete/improper liming score - 2
- 3. No liming score - 1

5. Use of chemical fertilizers

- 1. Use of chemical fertilizers on the basis of soil test results score - 3
- 2. Use of chemical fertilizers on the basis of general package of practices score - 2  
(Not on the basis of soil test results)
- 3. No chemical fertilizer application score - 1

6. Use of plant protection chemicals

- 1. Correct/proper use of plant protection chemicals score - 3
- 2. Incorrect/improper use of plant protection chemicals score - 2

### 3. No application of plant protection

chemicals even when it was necessary score - 1

After computing the adoption score of the respondents with respect to the six practices, the mean score for the participant farmers and the non-participant farmers were calculated separately.

## 2. Independent variables

### 1. Socio-economic status

In order to measure socio-economic status, the scale developed by Venkataramaiah(1983) was used after modifying it to suit the conditions prevailing in the study area.

The scale consists of eight items. They are occupation, land holding, income, education, socio-political participation, possessions, house and household.

The assignment of scores for the various items was as follows.

1. Occupation	Scores
No occupation	0
Unskilled	1

Semi-skilled	2
Skilled	3
Farming	4
Professional	5

2. Land holding Scores

No land	0
Less than one acre	1
1-5 acre	2
>5 acre	3

3. Annual Income Scores

Rs.1200- Rs1800	1
Rs.1801- Rs2400	2
Rs.2401- Rs.3500	3
Rs.3501- Rs.4800	4
Rs.4801 and above	5

4. Education Scores

No schooling/illiterate	0
Functionally literate	1
Primary school	2
Middle school	3
High school	4

College	5
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5. Socio-political participation	Scores
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Without any official position in	0
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socio-political organisations	
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Official position in one or more	1
----------------------------------	---

organisation	
--------------	--

Functional contribution or raising fund	2
---	---

for common works	
------------------	--

Active office bearer	3
----------------------	---

Involvement in community work	4
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6. Possessions	Scores
----------------	--------

None	0
------	---

One farm animal (Bullock, Buffalo, Cow)/	1
--	---

cycle/furniture	
-----------------	--

Two farm animals/bullock cart/radio	2
-------------------------------------	---

Three to four farm animals/improved	3
-------------------------------------	---

farm implements, news paper/electricity	
---	--

Five to ten farm animals/gobar gas plant/	4
---	---

pump set	
----------	--

More than ten farm animals/tractor/	5
-------------------------------------	---

automobile	
------------	--

7. House	Scores
Shed thatched	1
Mud wall and tiled	2
Brick wall and tiled	3
Concrete house	4
Concrete and double storied	5

8. House hold	Scores
Small	1
Medium	2
Large	3
Very large	4
Special features	5

## 2. Extension orientation

The method used by Bhaskaran(1979) was used with slight modification. The extension orientation consisted of the following items.

1. Extension contact
2. Extension participation

### 1. Extension contact

The extent of extension contact by the farmers was computed by giving scores to the items as below.

Frequency of meeting gramsevak/Agricultural Assistant/ Agricultural Officer/Block Development Officer	Scores
Two or more times a week	3
Once a week	2
Once to thrice a month	1
Never	0

## 2. Extension participation

The following activities were included to evaluate the extension participation of the respondents after consultation with the agricultural extension agencies in the area.

1. Meetings
2. Seminars
3. Exhibitions
4. Film shows
5. Farmers' days
6. Demonstrations
7. Field days

The respondent's participation in the above extension activities for the past one year was the index used to arrive at extension participation scores as below.

Frequency	Scores
Whenever conducted	2
Not attending all the times whenever the ) activities were conducted )	1
Never	0

The scores obtained for both the sub-items by each of the respondents were calculated and summed up and this gave the extension orientation score of the respondent.

### 3. Cosmopolitaness

The method suggested by Desai(1981) was used for measuring cosmopolitaness of the respondents. It was measured in terms of the frequency of visit to the nearby town, purpose of visit and membership in organisations outside the village.

The scoring procedure was as follows

1. Frequency of visit to the nearby town	Scores
Never	0
Once in a month	1
Once in a fortnight	2
Once in a week	3
Two/more times a week	4

2. Purpose of visit	Scores
Entertainment	0
Other purpose	1
Personal/professional	2
Agricultural	3
3. Membership in organisation outside the village	Scores
Non-member	0
Member	1

The total score obtained by an individual was taken as his cosmopolitanness score.

#### 4. Mass media participation

The procedure used by Anantharaman(1977) was adopted to measure the extent of participation of the respondents in different mass media. The scoring was done as follows.

Mass medium	Frequency	Scores
Radio	Daily	5
	Two to six days	4
	a week	



	Once a week	3
	Once a fortnight	2
	Rarely	1
	Never	0
Newspaper	Daily	5
	Two to six days a week	4
	Once a week	3
	Once a fortnight	2
	Rarely	1
	Never	0
Magazines	Regularly	2
leaflets	Occasionally	1
bulletins	Never	0
Films(seen during last year)	More than six times	3
	4-6 times	2
	Once to three times	1
	None	0

The total score of each respondent was computed and was taken as his score for mass media participation.

## 5. Scientific orientation

The scale developed by Supe(1969) was used for this study to know the respondent's scientific orientation. The scale consisted of six statements of which one was negative. The responses were collected on a five-point continuum as shown below.

Points in the continuum	Scores
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

The scoring pattern was reversed for negative statement. The total scores thus obtained by an individual was taken as his score for scientific orientation.

## 6. Crop yield index

The scale developed by Samantha(1977) was used with slight modification for quantifying this variable.

For calculating the crop yield index of a particular farmer, the average yield of paddy in the village was first determined. By dividing the yield/unit area of

paddy on the particular farm by the average yield of paddy in the village and multiplying by 100 a percentage was obtained.

For the purpose of this study, the yield levels of paddy in respect of each individual farm for the two crop seasons, coconut, banana, tapioca in the year preceding the year of study were recorded.

By using the area devoted to the cultivation of these crops as a weight to multiply this percentage index, the products were obtained for each respondent. By adding the products and dividing the sum of the products by the total area under the four crops, the crop yield index for the particular respondent was obtained.

#### 7. Management orientation

For measuring the farmers' management orientation, the scale developed by Samantha (1977) was used. It consisted of 18 statements - six each for planning, production and marketing orientations. In each group, positive and negative statements were mixed. In the case of a positive statement, a score of one was given for agreement and zero for disagreement. For a negative statement, the

scoring pattern was reversed. The sum of the scores obtained by a respondent was taken as his score for management orientation.

In order to analyse the distribution of the participant farmers and the non-participant farmers with respect to the selected characteristics, they were categorised into three groups as given below based on the mean and the standard deviation values (Appendix -1) of the corresponding groups.

<u>Category</u>	<u>Criterion</u>
Low	< Mean - Standard deviation
Medium	Mean $\pm$ Standard deviation
High	> Mean + Standard deviation

### 3. Perception about the innovation-characteristics of the Rice Minikit Varieties

Perception about the innovation characteristics of the Rice Minikit Varieties was measured using the scale developed by Nair(1968). It consists of five innovation-characteristics namely complexity, cost,profitability, suitability and labour requirement which were rated in a five-point continuum. The scoring pattern followed is given below.

Sl. No.	Innovation-characteristic	Continuum with score				
1	Complexity /Difficulty	Very easy (5)	Easy (4)	Neither easy nor difficult (3)	Difficult (2)	Very difficult (1)
2	Cost	Very low (5)	Low (4)	Neither low nor high (3)	High (2)	Very high (1)
3	Profitability	Most profitable (5)	Profitable (4)	Somewhat profitable (3)	Least profitable (2)	Not profitable (1)
4	Suitability	Most suitable (5)	Suitable (4)	Somewhat suitable (3)	Least suitable (2)	Not at all suitable (1)
5	Labour requirement	Much more (1)	Little more (2)	No difference (3)	Less labour (4)	Much less labour (5)

The perception about each innovation-characteristic was separately analysed for the participant and the non-participant farmers by taking the characteristic-wise scores alone.

#### 4. Evaluation of the procedure of conducting Rice Minikit Trials

The exact procedures for conducting the Rice Minikit Trials were listed by referring to the instructions promulgated by the Department of Agriculture and Co-operation, Krishi Bhavan, New Delhi and the Directorate of Agriculture, Govt. of Kerala as well as by consulting the officials in charge of the Rice Minikit Programme in the State Department of Agriculture, Kerala.

In order to find out the extent to which these instructions were adhered to, the Agricultural officers were asked to indicate their responses against each of the fifteen selected procedural requirements as 'Yes' if they had done it or 'No' if they had not. In the same way responses were obtained from the participant farmers too. These responses were compared after doing percentage analysis, to get a discernible picture of evaluation of the procedure of conducting Rice minikit Trials.

5. Constraints experienced by the extension personnel and the participant farmers in conducting Rice Minikit Trials

Based on discussion with the extension personnel and the participant farmers and also through review of relevant literature, the constraints faced by the extension personnel and the participant farmers were collected separately.

Ten constraints experienced by the extension personnel and fourteen constraints felt by the participant farmers were finally selected and these constraints were enlisted in the respective interview schedules.

The response to each constraint was obtained on a three-point continuum viz. most important, important and least important. In order to rank the constraints, a cumulative index was calculated. For this, weightages of 3, 2 and 1 were given to the responses most important, important and least important, respectively. The frequency of responses under each category was multiplied with the corresponding weightage and added to get a cumulative index for the particular constraint. The ratio between the cumulative index and the frequency of responses for each constraints was worked out. Based on this ratio, the constraints were ranked in each case.

## 5. Techniques employed in data collection

Personal interview method was used for collecting data from the farmer respondents while data from the Agricultural Officers were obtained through a questionnaire. The draft of the interview schedule was pre-tested in a pilot study conducted in a non-sample area and suitable modifications were made accordingly.

Data collection was carried out during September-October 1991. The interview schedule was prepared in Malayalam and the farmers were individually interviewed and their responses were recorded. Data from the Agricultural Officers were also collected in person by supplying them with the questionnaires.

## 6. Statistical methods employed

### 1. Simple Correlation Analysis

To study the relationship between each independent variable and the dependent variable simple correlation analysis was done.



The formula used was

$$\text{Correlation coefficient } (r) = \frac{\text{Exy} - \text{ExEy}/n}{\sqrt{\text{Ex}^2 - (\text{Ex})^2/n \cdot \text{Ey}^2 - (\text{Ey})^2/n}}$$

where,

x = independent variable

y = dependent variable

n = number of observations

## 2. Multiple Correlation and Regression Analysis

As mere relationship of the variables studied in isolation will not throw light as to how much they actually contribute to the variations in the dependent variable, particularly in the presence of one another, the multiple regression analysis was carried out.

The multiple correlation coefficient (R) represented the zero-order correlation between the actual dependent variable scores and the predicted dependent variable scores obtained from the independent variables under consideration. If the predicted dependent variable score for each farmer would exactly correspond to his actual dependent variable score obtained in the study the multiple correlation coefficient would be unity or 1.00

The square of the multiple correlation coefficient ( $R^2$ ) represented the proportion of the total variation explained by the independent variables in the regression equation taken together.

The partial regression coefficients or partial "b" s were obtained for the variables included in the regression equation. The following prediction equation was used in the present study to determine the multiple regression.

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7$$

in the case of the participant farmers , and

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7$$

in the case of the non-participant farmers, where

a=constant

$b_1$ =the coefficient which appears in the equation which represents the amount of change in Y that can be associated with unit increase in 'x<sub>1</sub>' with the remaining independent variables held fixed. This is referred to as partial regression coefficient or partial 'b'.

Y = Adoption of the recommended practices

x<sub>1</sub> = Socio-economic status

x<sub>2</sub> = Extension orientation

x<sub>3</sub> = Cosmopolitaness

x<sub>4</sub> = Mass media participation

$x_5$  = Scientific orientation

$x_6$  = Crop yield index

$x_7$  = Management orientation

A correction was made to bring the measurements of the independent variables to a single unit. The correction was effected by standardising each partial 'b' value using the standard deviation of the respective variable. A standard 'b' called the beta weight of the partial coefficient was computed by the following formula.

$$\text{Beta weight} = \frac{\text{S.D. of independent variable}}{\text{S.D. of dependent variable.}} \times \text{partial 'b'}$$

The absolute values of these beta weights indicated the relative importance of the independent variables in the regression equation.

### 3. Path Analysis

Path analysis was used to know the direct and indirect influence of the independent variables on the dependent variable and to know the extent of determination of these variables on the dependent variable.

#### 4. Mann-Whitney U Test

This test was used to test whether there was significant difference between the two groups of respondents with respect to the dependent variable as well as that along the various dimensions of dependent variable and the perception about the innovation-characteristics of the minikit varieties of rice.

The scores of both the groups could be arranged in ascending order of magnitude and were ranked from the lowest value to the highest value irrespective of the groups to which each score belonged.

Let 'W' be the number of times the score in one group precedes the score of the other group. 'W' could be obtained directly using the formula

$$W = n_1 n_2 + \left( \frac{n_1 (n_1 + 1)}{2} \right) - T_1$$

where,

$n_1$  = number of observations in group 1

$n_2$  = number of observations in group 2

$T_1$  = sum of the ranks in the group of size  $n_1$

Then the normal test of significance 'z' was calculated using the formula

$$z = \frac{| W - (n_1 n_2) / 2 |}{\sqrt{n_1 n_2 (n_1 + n_2 + 1) / 12}}$$

where,

W = number of times the scores in one group precedes the score of other group

n<sub>1</sub> = number of observations in group 1

n<sub>2</sub> = number of observations in group 2

## ***RESULTS***

#### 4. RESULTS

The results of the study are presented in this chapter under the following sub-heads.

1. Analysis of the characteristics of the participant and the non-participant farmers.
  - 1.1. Distribution of the participant and the non-participant farmers with respect to their selected characteristics.
  - 1.2. Comparison of mean scores of the participant and the non-participant farmers on the selected characteristics.
2. Analysis of the adoption behaviour of the participant and the non-participant farmers.
  - 2.1. Distribution of the participant and the non-participant farmers according to their adoption of recommended practices.
  - 2.2. Comparison of mean scores of the participant and the non-participant farmers according to their adoption of recommended practices.
  - 2.3. Distribution of the participant and the non-participant farmers with respect to the adoption of each selected practice.

3. Relationship between the farmers' characteristics and the adoption of recommended practices by them.
4. Perception of the farmers about the innovation - characteristics.
5. Evaluation of the procedure of conducting Rice Minikit Trials.
6. Constraints experienced by the Extension-personnel and the participant farmers in conducting the Rice Minikit Trials.

1. Analysis of the characteristics of the participant and the non-participant farmers.

1.1. Distribution of the participant and the non-participant farmers with respect to their characteristics.

1.1.1. Socio-economic status

The distribution of the participant and the non-participant farmers with respect to their socio-economic status is furnished in Table 3.



Table 3. Distribution of the participant and the non-participant farmers with respect to socio-economic status.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	8	13.33	14	23.33
2	Medium	38	63.33	35	58.33
3	High	14	23.33	11	18.33

Table 3 shows that majority of the participant farmers as well as the non-participant farmers belonged to the medium socio-economic status group. The percentage of farmers belonging to the low socio-economic status group was more in the case of the non-participant farmers while the percentage of farmers having high socio-economic status was more in the case of the participant farmers.

#### 1.1.2. Extension orientation

The distribution of the participant and the non-participant farmers with respect to their extension orientation is presented in Table 4.

Table 4. Distribution of the participant and the non-participant farmers with respect to their extension orientation.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	2	3.33	26	43.33
2	Medium	44	73.33	27	45.00
3	High	14	23.33	7	11.67

Table 4 reveals that the demarcation between the participant and the non-participant farmers was more clear in the case of extension orientation. The distribution of the participant farmers was low (3.33 per cent) in the low category while it was 43.33 per cent in the case of non-participant farmers. When 73.33 per cent of the participant farmers belonged to medium extension orientation group only 45 per cent of the non-participant farmers belonged to this group. In the high category when there was 23.33 per cent of the participant farmers, only just half of it was among the non-participant farmers.

### 1.1.3. Cosmopolitaness

The distribution of the participant farmers and the non-participant farmers according to their cosmopolitaness is given in Table 5.

Table 5. Distribution of the participant and the non-participant farmers with respect to their cosmopolitaness.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	9	15.00	8	13.33
2	Medium	46	76.67	48	80.00
3	High	5	8.33	4	6.67

A perusal of Table 5 evinces homogeneity among the respondents as far as their cosmopolitaness is concerned. Still, the percentage of farmers having medium level of cosmopolitaness was slightly more in the case of the non-participant farmers.

### .1.4. Mass media participation

The distribution of the participant and the non-participant farmers with respect to their mass media participation is given in Table 6.

Table 6. Distribution of the participant and the non-participant farmers with respect to their mass media participation.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	4	6.67	6	10.00
2	Medium	48	80.00	47	78.33
3	High	8	13.33	7	11.67

As Table 6 shows majority of the respondents had medium level of mass media participation. The percentage of respondents belonging to the low, medium and high categories of mass media participation was not much difference in the case of the participant and the non-participant farmers.

#### 1.1.5. Scientific orientation

The distribution of the participant and the non-participant farmers based on their scientific orientation is furnished in Table 7.

Table 7. Distribution of the participant and the non-participant farmers according to their scientific orientation.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	5	8.33	7	11.67
2	Medium	53	88.33	53	88.33
3	High	2	3.33	0	0.00

It was evident from Table 7 that 88.33 per cent each of both the participant and the non-participant farmers had medium level of scientific orientation. Interestingly, while none of the non-participant farmers came under the high scientific orientation category, 3.33 per cent of the participant farmers had high level of scientific orientation.

#### 1.1.6. Crop yield index

The distribution of the participant and the non-participant farmers with respect to their crop yield index is given in Table 8.

Table 8. Distribution of the participant and the non-participant farmers according to their crop yield index.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	4	6.67	12	20.00
2	Medium	45	75.00	40	66.67
3	High	11	18.33	8	13.33

As Table 8 shows 75 per cent of the participant farmers had medium level of crop yield index and 18.3 per cent of them came under the high crop yield index category. Percentage of farmers belonging to the low group of crop yield index was more in the case of the non-participant farmers. The highest percentage came under the medium category in both the groups of farmers.

#### 1.1.7. Management orientation

The distribution of the participant and the non-participant farmers with respect to their management orientation is furnished in Table 9.

Table 9. Distribution of the participant and the non-participant farmers according to their management orientation.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	1	1.67	3	5.00
2	Medium	50	83.33	54	90.00
3	High	7	15.00	3	5.00

Majority of the respondents had medium level of management orientation as evidenced from Table 9 (83.33 percentage and 90 percentage for the participant and the non-participant farmers respectively). When 15 per cent of the participants had high level of management orientation, only five per cent of the non-participants had high level of the same.

### 1.2. Comparison of mean scores of the participant and the non-participant farmers on the selected characteristics

A comparison of mean scores of the participant and the non-participant farmers on the selected characteristics is presented in Table 10.

Table 10. Mean scores of the participant farmers and the non-participant farmers on the selected characteristics.

Sl. No.	Characteristics	Mean scores of		Z' value
		Participant farmers (n=60)	Non-participant farmers (n=60)	
1	Socio-economic status	20.18	16.47	3.291**
2	Extension orientation	2.83	0.79	8.493**
3	Cosmopolitaness	6.05	5.86	1.102 <sup>NS</sup>
4	Mass media participation	12.43	10.22	5.217**
5	Scientific orientation	16.53	14.85	5.862**
6	Crop yield index	130.75	123.50	7.453**
7	Management orientation	31.83	30.48	2.165*

xx significant at 1% level of probability  
 x significant at 5% level of probability  
 NS non-significant

From the results given in Table 10, it is clear that there was significant difference between the participant farmers and the non-participant farmers with



respect to their socio-economic status, extension orientation, mass media participation, scientific orientation, crop yield index and management orientation.

The difference between the participant and the non-participant farmers was found to be non-significant as far as their cosmopolitanness was concerned.

A comparison of the mean scores of the participant as well as the non-participant farmers along their different characteristics reveals that the highest difference was noticed in the case of crop yield index ( mean scores being 130.75 and 123.50 respectively ). This was followed by socio-economic status ( mean scores being 20.18 and 16.47 respectively ) and mass media participation ( 12.43 and 10.22 being the corresponding mean scores ). The order of difference between the participant and the non-participant farmers with respect to other characteristics was scientific orientation ( 16.53 and 14.85 ), management orientation ( 31.83 and 30.48 ) and Cosmopolitanness ( 6.05 and 5.86 ).

2. Analysis of the adoption behaviour of the participant and the non-participant farmers.

2.1. Distribution of the participant and the non-participant farmers according to their adoption of recommended practices.

The distribution of the participant and the non-participant farmers according to their adoption of recommended practices is furnished in Table 11.

Table 11. Distribution of the participant and the non-participant farmers according to their adoption of recommended practices.

Sl.No.	Category	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1	Low	6	10.00	4	6.67
2	Medium	45	75.00	51	85.00
3	High	9	15.00	5	8.33

Table 11 reveals that 15 per cent of the participant farmers had high level of adoption whereas it was only five per cent in the case of the non-participants. The percentage of respondents belonging to the medium level

of adoption was more in the case of the non-participant farmers (85 per cent) than the participant farmers (75 per cent) .

2.2. Comparison of mean scores of the respondents on the adoption of recommended practices.

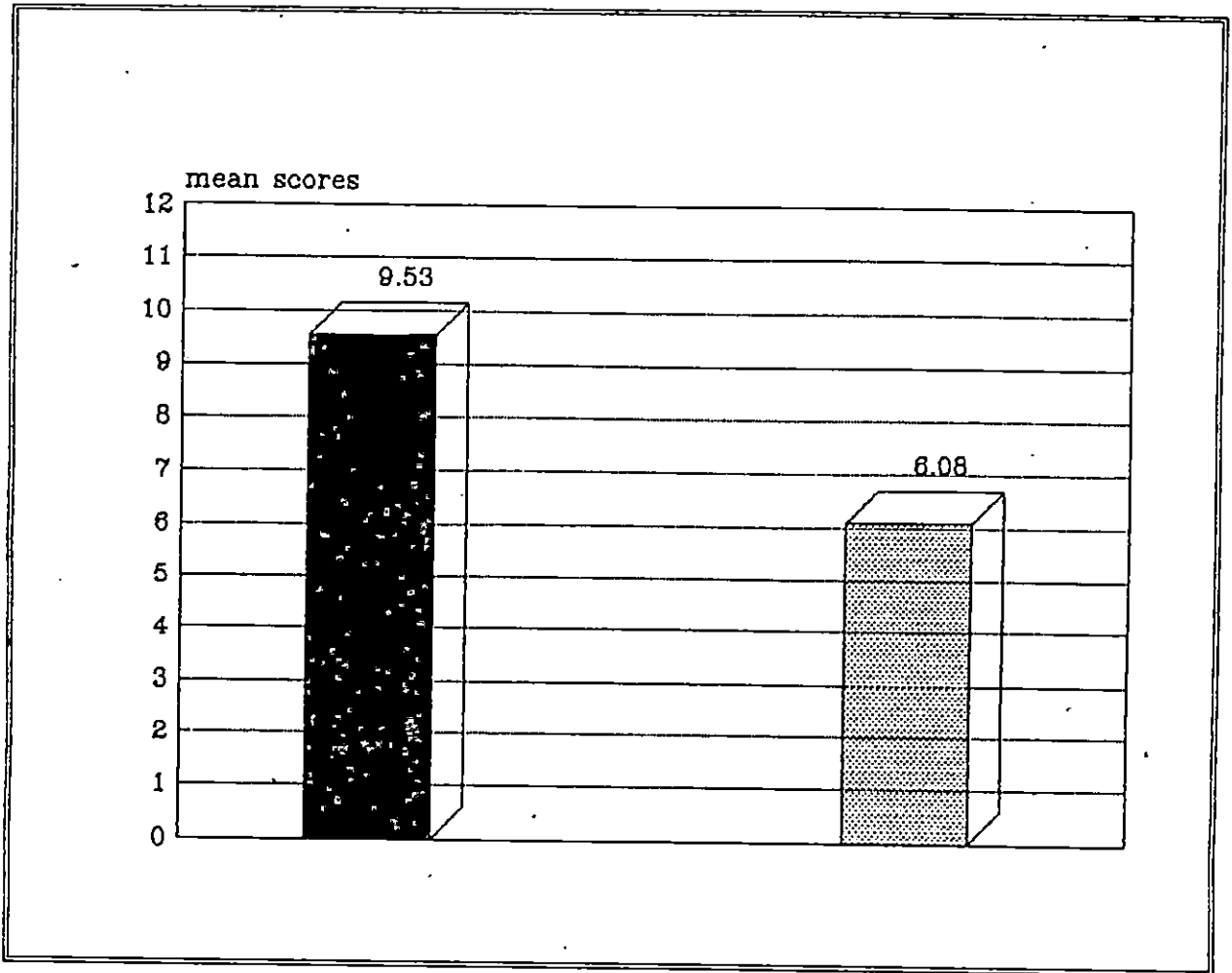
The comparison of mean scores of the participant as well as the non-participant farmers is given in Table 12 and Figure 3.

Table 12. Mean scores of the respondents on the adoption of recommended practices.

Respondents	Mean Adoption Score	'Z' value
Participant farmers (n=60)	9.53	7.20**
Non-participant farmers (n=60)	6.08	

xx significant at 1% level of probability

It was clearly indicated by the results in Table 12 that the mean adoption score for the participant farmers (9.53) was significantly higher than that of the non-participants (6.08). This was explained by the 'Z' value obtained which was found to be significant at one per cent level.



**Fig. 3 Mean scores of the farmer respondents on the adoption of recommended practices**



**Participant farmer**



**Non-participant farmer**

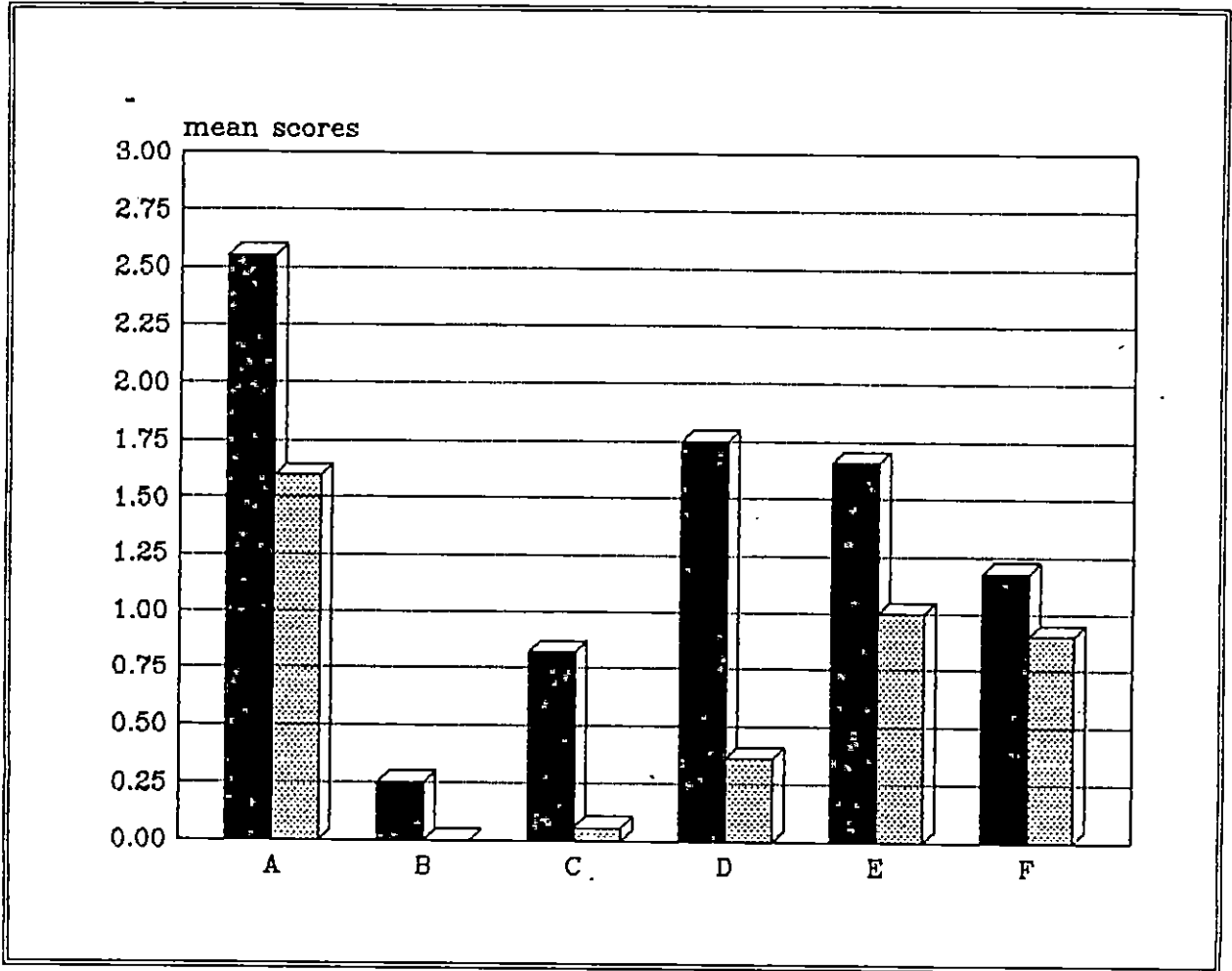
2.3. Distribution of the participant and the non-participant farmers with respect to the adoption of each selected practice.

The distribution of the participant as well as the non-participant farmers with respect to the adoption of each recommended practice, is furnished in Table 13 and Figure 4.

Table 13. Distribution of the participant and the non-participant farmers with respect to the adoption of each recommended practice.

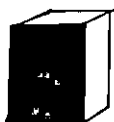
Sl. No.	Recommended practice	Mean scores of		Z' value
		Participant farmers (n=60)	Non-participant farmers (n=60)	
1	Variety	2.55	1.60	6.6605**
2	Seed treatment	0.25	0.00	2.3618*
3	Soil testing	0.82	0.06	5.3221**
4	Liming	1.75	0.36	4.5978**
5	Fertilizer application	1.66	1.00	4.7238**
6	Application of plant protection chemicals	1.17	0.90	2.3618*

xx significant at 1% level of probability  
 x significant at 5% level of probability

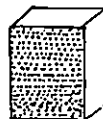


**Fig. 4 Mean scores of the participant and the non-participant farmers with respect to adoption of each recommended practices**

- A. Variety
- B. Seed treatment
- C. Soil testing
- D. Liming
- E. Fertilizer application
- F. Application of plant protection chemicals



Participant farmer



Non-participant farmer

An examination of Table 13 reveals that there was significant difference between the participant farmers and the non-participant farmers with respect to their adoption of each of the recommended practice as explained by the 'Z' values that proved to be significant in the case of all the six practices.

A comparison between the mean scores on the adoption of each practice of both the participant and the non-participant farmers revealed that the former excelled the latter in adopting these practices. None of the non-participant farmers adopted seed treatment. More number of the participant farmers applied plant protection chemicals compared to the non-participant farmers.

### 3. Relationship between the farmers' characteristics and the adoption of recommended practices by them.

The correlation coefficients showing the relationship between the farmers' characteristics and the adoption of recommended practices by participant as well as the non-participant farmers are furnished in Table 14 and Figure 5.

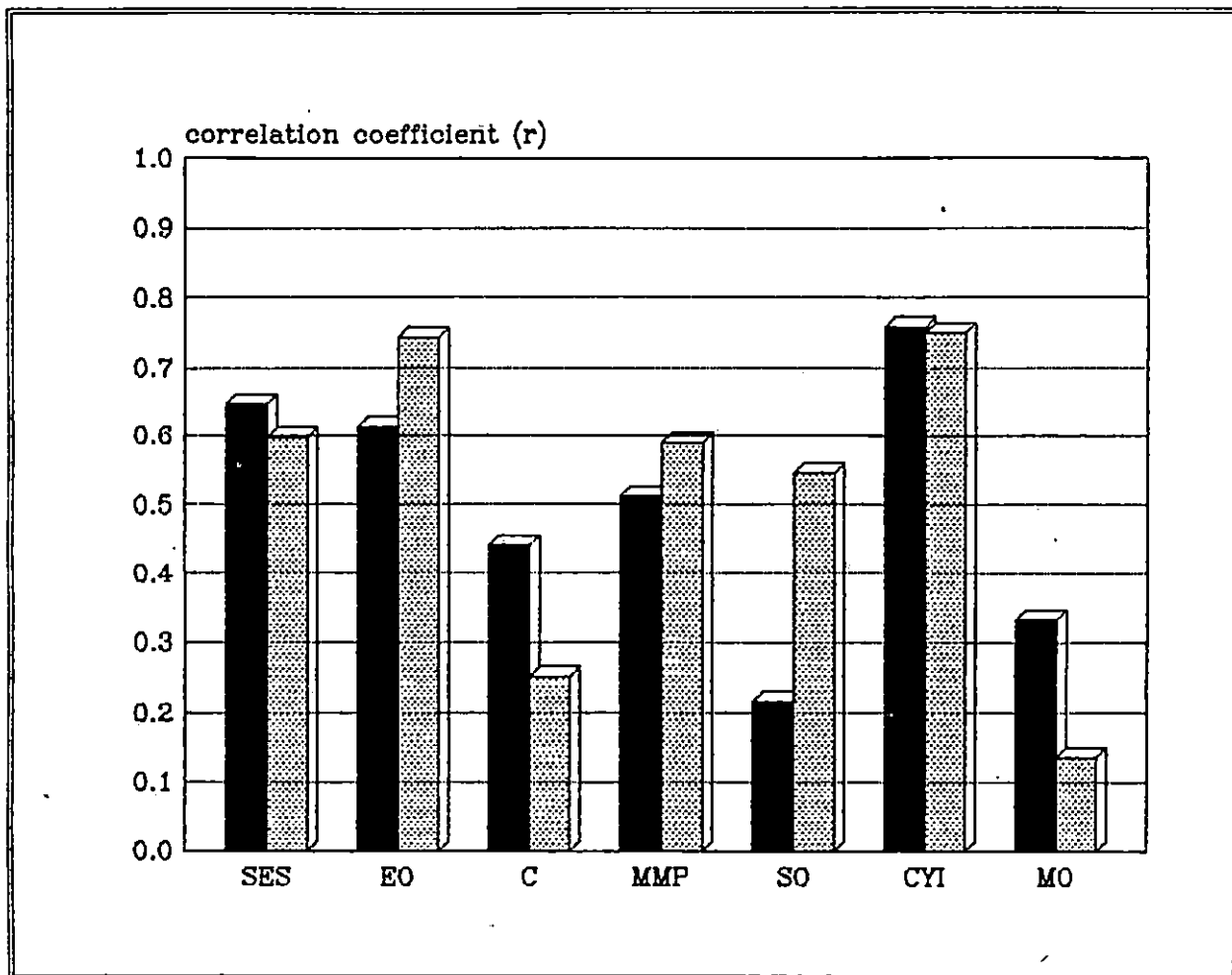
Table 14. Correlation between respondents' characteristics and the adoption of recommended practices by them.

Vble. No.	Name of the characteristic	Correlation coefficient 'r'	
		Participant farmers (n=60)	Non-participant farmers (n=60)
X <sub>1</sub>	Socio-economic status	0.6459**	0.5972**
X <sub>2</sub>	Extension orientation	0.6117**	0.7421**
X <sub>3</sub>	Cosmopolitaness	0.4416**	0.2509*
X <sub>4</sub>	Mass media participation	0.5119**	0.5890**
X <sub>5</sub>	Scientific orientation	0.2153*	0.5451**
X <sub>6</sub>	Crop yield index	0.7579**	0.7495**
X <sub>7</sub>	Management orientation	0.3324**	0.1344 <sup>NS</sup>

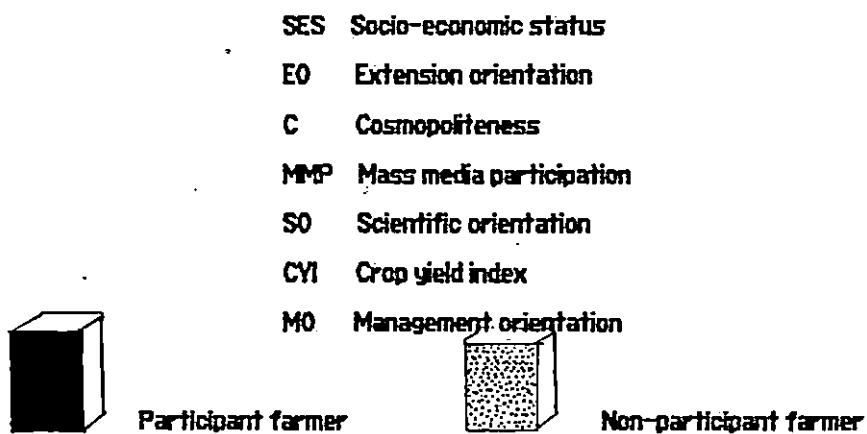
xx significant at 1% level of probability  
 x significant at 5% level of probability  
 NS non-significant

It is evident from Table 14 that there was positive and significant relationship for all the seven characteristics with the adoption of recommended practices in the case of the participant farmers and the non-participant farmers except for management orientation in the case of the latter.





**Fig. 5 Correlation between farmer respondents' characteristics and the adoption of recommended practices**



Management orientation was found to have no significant relationship with adoption of recommended practices by the non-participant farmers. In order to find out the extent of variation in the adoption of recommended practices explained by the respondent's characteristics, multiple regression analysis was carried out.

The results of the multiple regression analysis showing the variation in the participant farmers' adoption of the recommended practices contributed by the seven characteristics acting together are furnished in Table 15.

Table 15. Results of the multiple regression analysis showing the contribution of each characteristic of the participant on the level of adoption of recommended practices by them (n=60).

Sl. No.	Characteristics	Beta Weights	't' value	'F' value	R <sup>2</sup>
1.	Socio-economic status	0.0589	0.937 <sup>NS</sup>	20.05 <sup>**</sup>	0.7296
2.	Extension orientation	0.6902	2.374 <sup>*</sup>		
3.	Cosmopolitaness	-0.0365	0.146 <sup>NS</sup>		
4.	Mass media participation	0.1992	2.037 <sup>*</sup>		
5.	Scientific orientation	0.0910	0.719 <sup>NS</sup>		
6.	Crop yield index	0.2321	4.903 <sup>*</sup>		
7.	Management orientation	0.1243	1.348 <sup>NS</sup>		

R<sup>2</sup> Coefficient of determination  
 \*\* significant at 1 % level of probability  
 \* significant at 5 % level of probability.  
 NS non-significant

It was found that 73 per cent of the variation in adoption of recommended practices by the participant farmers was attributed to the seven characteristics included, as indicated by the coefficient of determination ( $R^2$ ). This variation was found to be significant as explained by the 'F' value ( $F = 20.05$ ).

The regression equation is,

$$Y = -31.6892 + 0.0589X_1 + 0.6902X_2 + -0.0365X_3 + 0.1992X_4 \\ + 0.0910X_5 + 0.2321X_6 + 0.1243X_7$$

Among the seven characteristics studied, extension orientation, mass media participation and crop yield index were found to have significant influence on adoption behaviour of the participant farmers. The other characteristics viz. management orientation, scientific orientation, cosmopolitaness and socio-economic status were found to have non-significant influence on adoption behaviour of the participants.

The results showed that a unit increase in the participant farmers' extension orientation resulted in an increase of 0.69 unit of their adoption of the recommended practices, other factors being kept constant. With a unit increase in crop yield index, their adoption was increased

by 0.23 unit. A unit increase in mass media participation resulted in the increase in the adoption by the participant farmers by 0.19 unit.

The results of the multiple regression analysis showing the variation in the non-participant farmers' adoption of recommended practices contributed by the seven characteristics acting together are given in Table 16.

Table 16 Results of the multiple regression analysis showing the contribution of each characteristic of the non-participant farmers on the level of adoption of recommended practices by them (n=60).

Sl. No.	Characteristics	Beta Weights	't' value	'F' value	R <sup>2</sup>
1.	Socio-economic status	0.0126	0.368 <sup>NS</sup>	28.79 <sup>xx</sup>	0.7949
2.	Extension orientation	0.5838	3.789 <sup>*</sup>		
3.	Cosmopolitaness	-0.0304	-0.451 <sup>NS</sup>		
4.	Mass media participation	0.1302	2.855 <sup>*</sup>		
5.	Scientific orientation	0.1185	1.527 <sup>NS</sup>		
6.	Crop yield index	0.1842	5.413 <sup>*</sup>		
7.	Management orientation	-0.0178	-0.786 <sup>NS</sup>		

R<sup>2</sup> Coefficient of determination  
 xx significant at 1 % level of probability  
 \* significant at 5 % level of probability.  
 NS not-significant.

The variation in the adoption of recommended practices by the non-participant farmers explained by the set of seven characteristics was found to be 79 per cent. The fitted regression was found to be significant as indicated by the 'F' value ( $F = 28.79$ ).

The regression equation is

$$Y = -19.66703 + 0.0126X_1 + 0.5838X_2 + -0.0304X_3 + 0.1302X_4 \\ + 0.1185X_5 + 0.1842X_6 + -0.0178X_7$$

The characteristics which were found to have significant influence on adoption of recommended practices by the non-participant farmers were extension orientation, crop yield index and mass media participation. The other characteristics like socio-economic status, management orientation, cosmopolitaness and scientific orientation were found to have non-significant influence on the adoption of recommended practices by the non-participant farmers.

The results indicated that a unit increase in extension orientation of the non-participant farmers gave rise to an increase of 0.58 unit of their adoption of recommended practices, other factors being kept constant. An increase of their crop yield index by one unit would bring an increase of 0.18 unit in their adoption of the

recommended practices. With a unit increase in mass media participation, an increase of 0.13 unit could be obtained in their adoption of recommended practices.

Path analysis was done to have a clearer idea about the influence, the characteristics of the farmers wield on their adoption behaviour.

The results of Path analysis delineating the direct and indirect effects of the characteristics on the adoption of recommended practices by the participant farmers are furnished in Table 17 and Figure 6.

Table 17. Direct and indirect effects of the characteristics on the adoption of recommended practices by the participant farmers (n=60).

Vble. No.	Name of characteristics	Direct Effect	Total indirect effect	Substantial indirect effect through	
				I	II
X <sub>1</sub>	Socio-economic status	0.1529	0.4929	0.2433 (X <sub>6</sub> )	0.1463 (X <sub>4</sub> )
X <sub>2</sub>	Extension orientation	0.2213	0.3892	0.2505 (X <sub>6</sub> )	0.0608 (X <sub>1</sub> )
X <sub>3</sub>	Cosmopoliteness	0.0003	0.4413	0.1335 (X <sub>6</sub> )	0.0988 (X <sub>1</sub> )
X <sub>4</sub>	Mass Media Participation	0.2092	0.3028	0.1533 (X <sub>6</sub> )	0.0962 (X <sub>1</sub> )
X <sub>5</sub>	Scientific orientation	0.0558	0.1596	0.0445 (X <sub>2</sub> )	0.0441 (X <sub>1</sub> )
X <sub>6</sub>	Crop yield index	0.4731	0.2849	0.1161 (X <sub>2</sub> )	0.0707 (X <sub>1</sub> )
X <sub>7</sub>	Management Orientation	0.1085	0.2239	0.1312 (X <sub>6</sub> )	0.0672 (X <sub>2</sub> )
			Residue = 0.5199		

It was found that the highest direct effect on the adoption of recommended practices was due to the characteristic crop yield index for the participant farmers ( 0.4731).

This was followed by extension orientation (0.2213) and mass media participation ( 0.2092) for the participant farmers.

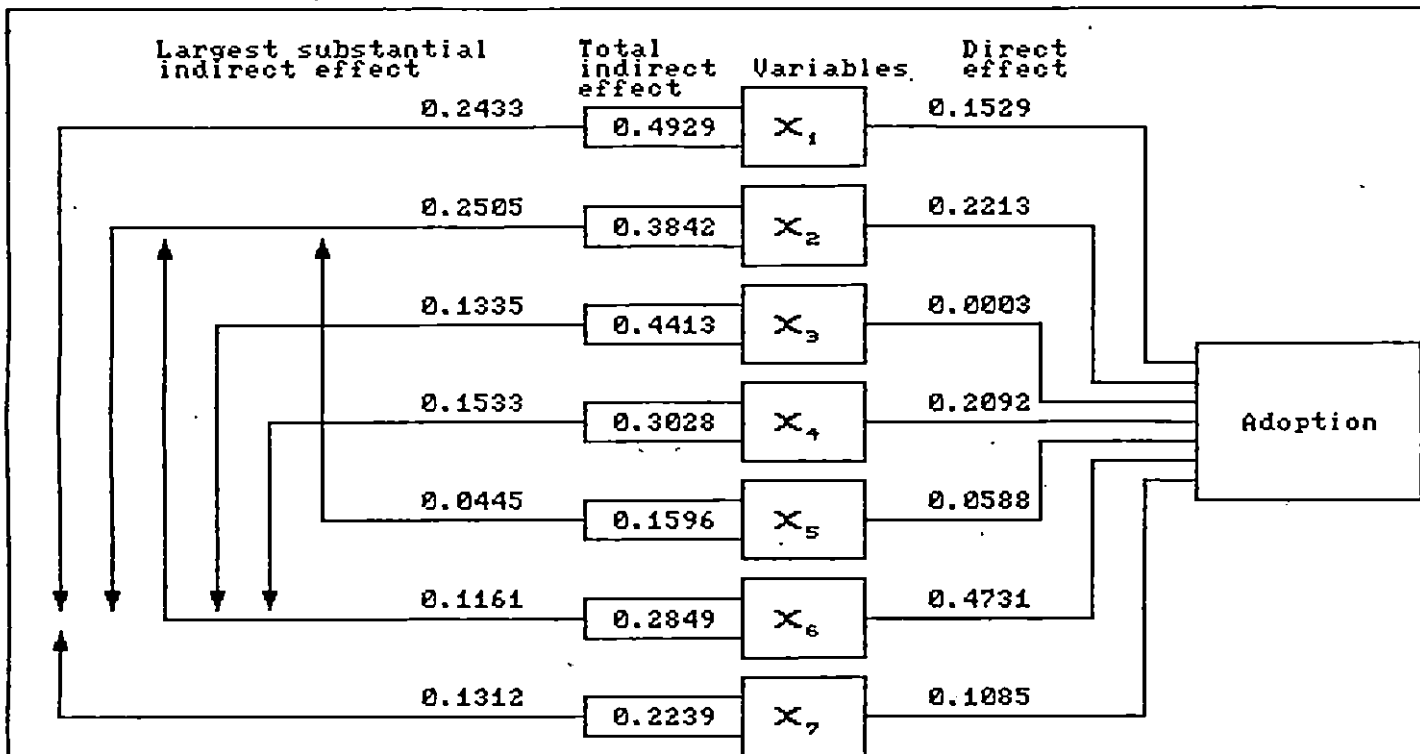


FIG. 6 Path diagram showing direct and indirect effects of the characteristics on the adoption of recommended practices by the participant farmers. (n=60)

- |  |   |
|--|---|
| X <sub>1</sub> - Socio-economic status | X <sub>4</sub> - Mass media participation |
| X <sub>2</sub> - Extension orientation | X <sub>5</sub> - Scientific orientation   |
| X <sub>3</sub> - Cosmopoliteness       | X <sub>6</sub> - Crop yield index         |
|  | X <sub>7</sub> - Management orientation   |



The least direct effect on the participant farmers' adoption behaviour was due to cosmopolitaness (0.003).

Table 18 and Figure 7 depict the results of Path analysis done in the case of the non-participant farmers.

Table 18. Direct and indirect effects of the characteristics on the adoption of recommended practices by the non-participant farmers (n=60).

Vble. No.	Name of characteristics	Direct Effect	Total indirect effect	Substantial indirect effect through	
				I	II
X <sub>1</sub> .	Socio-economic status	0.0221	0.5751	0.2602 (X <sub>2</sub> )	0.1877 (X <sub>6</sub> )
X <sub>2</sub> .	Extension orientation	0.3598	0.3823	0.2251 (X <sub>6</sub> )	0.0882 (X <sub>4</sub> )
X <sub>2</sub> .	Cosmopolitaness	-0.0317	0.2819	0.0968 (X <sub>4</sub> )	0.0876 (X <sub>2</sub> )
X <sub>4</sub> .	Mass media participation	0.2312	0.3579	0.1640 (X <sub>6</sub> )	0.1407 (X <sub>2</sub> )
X <sub>5</sub> .	Scientific orientation	0.1167	0.4284	0.1668 (X <sub>2</sub> )	0.1573 (X <sub>6</sub> )
X <sub>6</sub> .	Crop yield index	0.4223	0.3273	0.1966 (X <sub>2</sub> )	0.0898 (X <sub>4</sub> )
X <sub>7</sub> .	Management orientation	-0.0525	0.1870	0.0972 (X <sub>6</sub> )	0.0621 (X <sub>2</sub> )
				Residue = 0.4528	

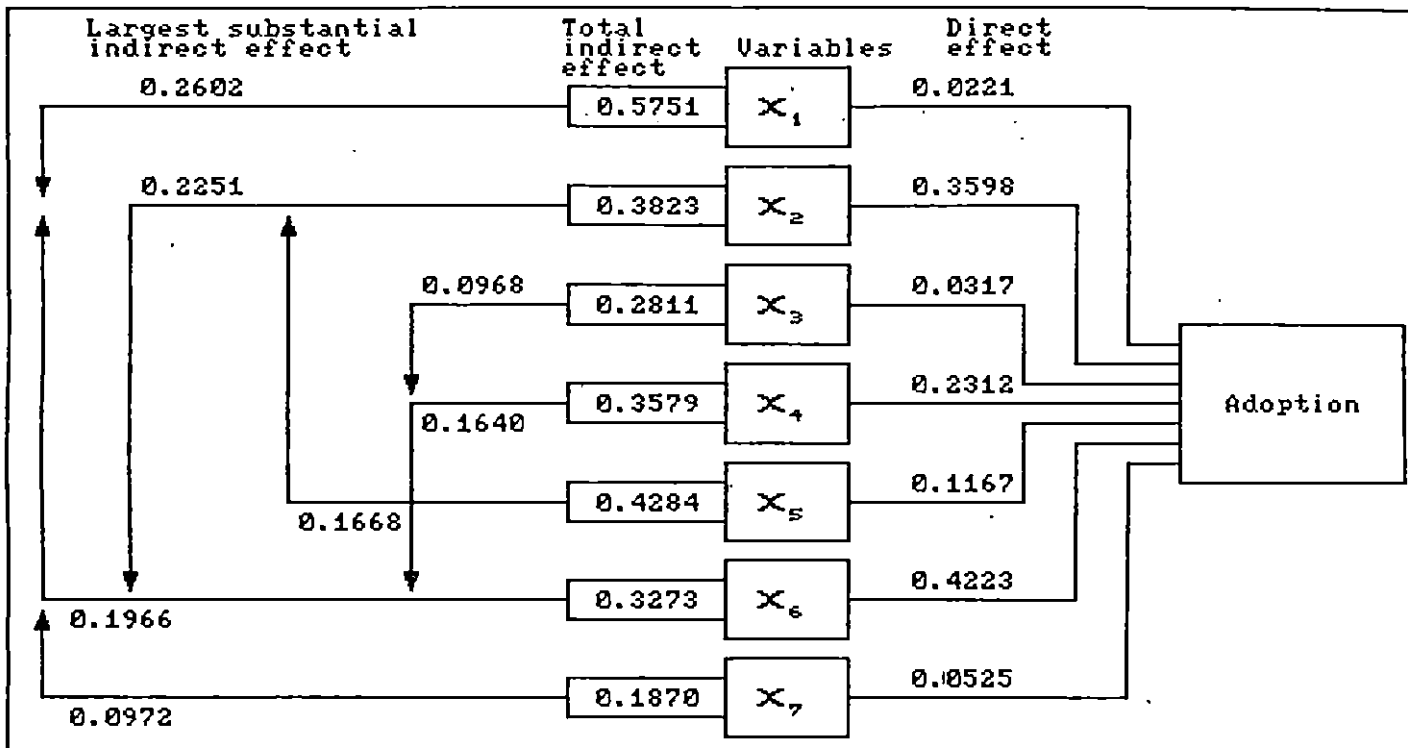


FIG. 7 Path diagram showing direct and indirect effects of the characteristics on the adoption of recommended practices by the non-participant farmers. (n=60)

- |  |   |
|--|---|
| X <sub>1</sub> - Socio-economic status | X <sub>4</sub> - Mass media participation |
| X <sub>2</sub> - Extension orientation | X <sub>5</sub> - Scientific orientation   |
| X <sub>3</sub> - Cosmopolitaness       | X <sub>6</sub> - Crop yield index         |
|  | X <sub>7</sub> - Management orientation   |

practices was due to crop yield index (0.4223) and this was followed by extension orientation (0.3598) and mass media participation (0.2312).

The characteristic-wise results of path analyses are presented below.

### 1. Socio economic status

#### 1.a. Participant farmers

The direct effect of this variable was 0.1529. Its substantial indirect effects on adoption of recommended practices were routed mainly through crop yield index ( $x_2$ ) (0.2433) and mass media participation ( $x_4$ ) (0.1463). The total indirect effect being 0.4929, was higher than the direct effect.

#### 1.b. Non-participant farmers

The direct effect of socio-economic status in the case of the non-participant farmers was 0.0221. Its substantial indirect effects on the dependent variable were routed mainly through extension orientation (0.2602) and mass media participation (0.1877). The total indirect effect being 0.3823, was higher than the direct effect.

## 2. Extension orientation

### 2.a. Participant farmers

The direct effect of this variable was 0.2213. Its substantial indirect effects were mainly coming through crop yield index (0.2505) and socio-economic status (0.0608). The total indirect effect being 0.3892, was more than the direct effect.

### 2.b. Non-participant farmers

The direct effect of the variable was 0.3598, which was lesser than the total indirect effect. Its substantial indirect effects were mainly routed through crop yield index (0.2251) and mass media participation (0.0882).

## 3. Cosmopolitaness

### 3.a. Participant farmers

The direct effect of this variable was 0.0003. Its substantial indirect effects were mainly routed through crop yield index (0.1335) and socio-economic status (0.0988). The total indirect effect being 0.4413, was more.

### 3.b. Non-participant farmers

The direct effect was 0.0317. Its substantial indirect effects were routed mainly through mass media participation (0.0968) and extension orientation (0.0876). The total indirect effect (0.2819) was higher than the direct effect.

## 4. Mass media participation

### 4.a. Participant farmers

The direct effect of this variable was 0.2092. Its substantial indirect effects were routed mainly through crop yield index (0.1533) and socio-economic status (0.0962). The total indirect effect being 0.3028, was higher than the direct effect.

### 4.b. Non participant farmers

The direct effect was 0.2312. Its substantial indirect effects were routed mainly through crop yield index (0.1640) and extension orientation (0.1407). The total indirect effect being 0.3579, was higher than the direct effect.

## 5. Scientific orientation

### 5.a. Participant farmers

The direct effect of this variable was 0.0558. Its substantial indirect effects were coming through extension orientation (0.0445) and socio-economic status (0.0441). The total indirect effect being 0.1596, was higher than the direct effect.

### 5.b. Non-participant farmers

The direct effect was 0.1167. Its substantial indirect effects were routed mainly through extension orientation (0.1668) and crop yield index (0.1573). The total indirect effect being 0.4284, was higher than the direct effect.

## 6. Crop yield index

### 6.a. Participant farmers

The direct effect of this variable was 0.4731. Its substantial indirect effects were routed mainly through extension orientation (0.1161) and socio-economic status (0.0707). The total indirect effect being 0.2849, was lesser than the direct effect.

### 6.b. Non-participant farmers

The direct effect was 0.4223 which was higher than the total indirect effect of 0.3273. Its substantial indirect effects were routed mainly through extension orientation (0.1766) and mass media participation (0.0898).

## 7. Management orientation

### 7.a. Participant farmers

The direct effect of this variable was 0.1085 which was lesser than the total indirect effect (0.2239). Its substantial indirect effects were routed mainly through crop yield index (0.1312) and extension orientation (0.0677)

### 7.b. Non-participant farmers

The direct effect was 0.0525 which was lesser than the total indirect effect (0.1870). Its substantial indirect effects were mainly routed through crop yield index (0.0972) and extension orientation (0.0621).

4. Perception of the participant and the non-participant farmers about the innovation-characteristics of the Minikit Varieties of Rice.

Table 19 shows the relative perception of the participant and the non-participant farmers about the innovation-characteristics of the Minikit varieties of rice.

Regarding the first innovation-characteristic viz. complexity, majority of the participant farmers (75 per cent) perceived it as neither easy nor difficult to cultivate minikit varieties of rice, 21.67 per cent of them felt it was difficult to cultivate these varieties whereas 3.33 per cent of the participant farmers perceived it as easy to cultivate these varieties. But in the case of the non-participant farmers 61.67 per cent of them perceived it as difficult to cultivate the minikit varieties and 38.33 per cent pointed out that it was neither easy nor difficult to cultivate them. None of them found it easy to cultivate minikit varieties of rice.

Majority of the participant as well as the non-participant farmers perceived the cost of cultivating the minikit varieties of rice as neither low nor high, the percentages being 81.67 and 56.67 respectively. 30.00 per cent of the non-participants put it high, and 13.33 per cent



Table 19. Relative perception of the participant and non participant farmers about the innovation-characteristic of the Minikit varieties<sup>b</sup> of rice

Innovation-characteristic	Response continuum	Participant farmers (n=60)		Non-participant farmers (n=60)	
		f	%	f	%
1. Complexity	very easy	-	-	-	-
	easy	2	3.33	-	-
	neither easy nor difficult	45	75.00	23	38.33
	Difficult	13	21.67	37	61.67
	very difficult	-	-	-	-
	Total	60	100.00	60	100.00
2. Cost	very low	-	-	-	-
	low	8	13.33	-	-
	neither low nor high	49	81.67	34	56.67
	high	3	5.00	18	30
	very high	-	-	8	13.00
	Total	60	100.00	60	100.00
3. Profitability	most profitable	2	3.33	-	-
	profitable	19	31.67	-	-
	somewhat profitable	37	61.67	27	45.00
	least profitable	2	3.33	13	21.67
	not profitable	-	-	20	33.33
	Total	60	100.00	60	100.00
4. Suitability	most suitable	-	-	-	-
	suitable	43	71.67	22	36.67
	somewhat suitable	17	28.33	12	20.00
	least suitable	-	-	26	43.33
	not at all suitable	-	-	-	-
	Total	60	100.00	60	100.00
5. Labour requirement	much more	-	-	2	3.33
	little more	15	25.00	22	36.67
	no difference	45	75.00	36	60.00
	less labour	-	-	-	-
	much less labour	-	-	-	-
	Total	60	100.00	60	100.00

of them perceived it as very high. Only 3.33 per cent of the participant farmers perceived it as high. Interestingly, 13.33 per cent of them felt the cost of cultivation as low.

Majority of the participant as well as the non-participant farmers perceived the profitability of cultivating the minikit varieties of rice as somewhat profitable. (61.67 per cent and 45.00 per cent, respectively). 31.67 per cent of the participant farmers felt that it was profitable to cultivate these varieties and 3.33 per cent of them perceived it as the most profitable. None of the participant farmers perceived it as not profitable. 33.33 per cent of the non-participant farmers perceived that it was not-profitable to cultivate the minikit varieties and 21.67 per cent of them perceived it as the least profitable.

Most of the participant as well as the non-participant farmers perceived the minikit varieties as suitable to their farming situation. (71.67 per cent and 36.67 per cent, respectively). 28.33 per cent of the participant farmers and 23.33 per cent of the non-participant farmers perceived it as somewhat suitable. 43.33 per cent of the non-participant farmers perceived it as the least suitable compared to the local varieties.

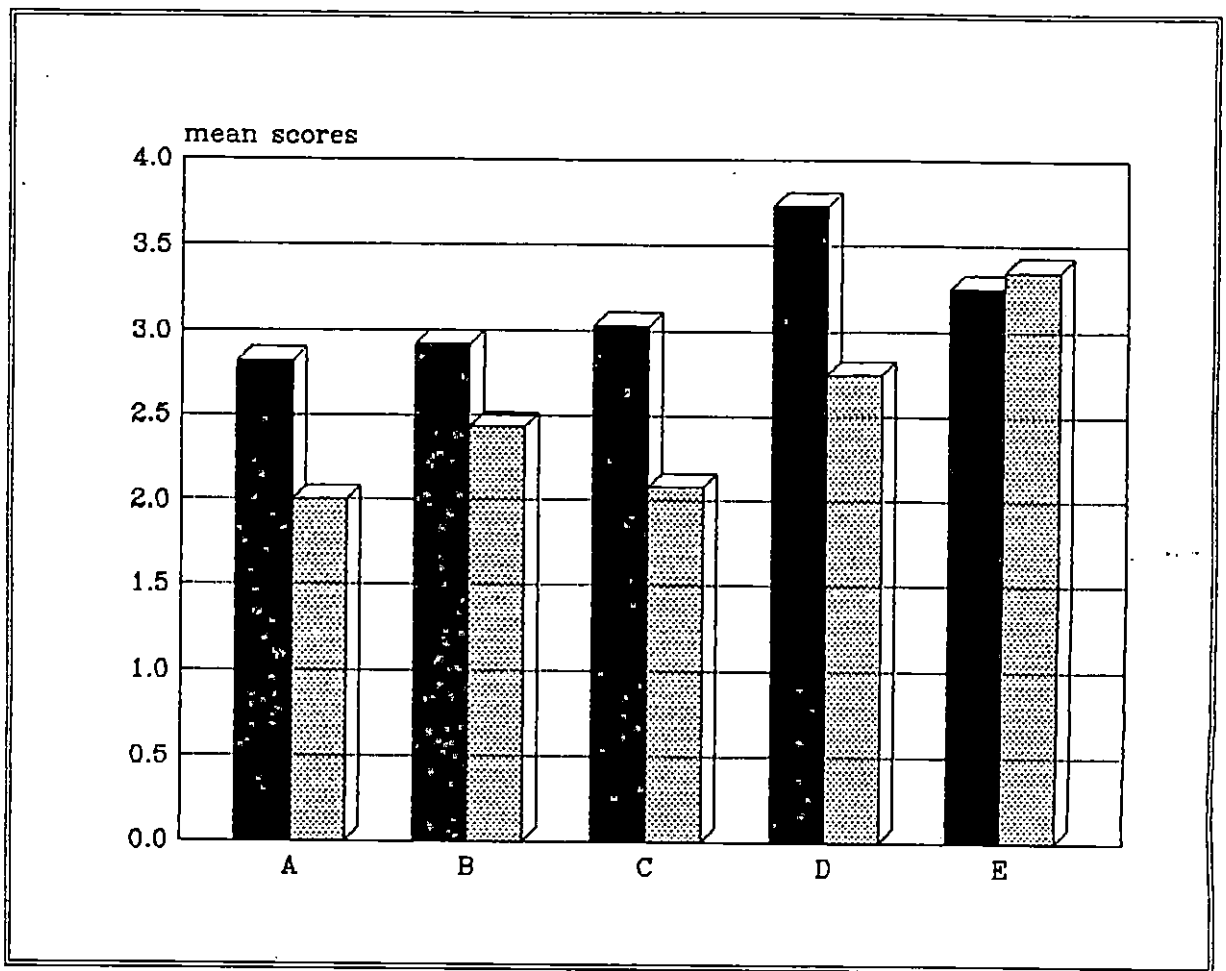
Regarding the requirement of labour in the cultivation of the minikit varieties, majority of the participant as well as the non-participant farmers perceived no difference when compared to that of local varieties (75.00 per cent and 60.00 per cent respectively). For 36.67 per cent of the non-participant farmers and 25.00 per cent of the participant farmers, the cost of cultivating these varieties was little more. 3.33 per cent of the non-participant farmers perceived it as much more.

The perception of the innovation-characteristics by the participant and the non-participant farmers is further explained through Table 20 and Figure 8.

Table 20. Perception of the innovation-characteristics by the participant and the non-participant farmers.

Sl. No.	Innovation-characteristics	Mean scores		'Z' value
		Participant farmers (n=60)	Non-participant farmers (n=60)	
1	Complexity	2.82	2.0	3.8997**
2	Cost	2.92	2.43	3.2699**
3	Profitability	3.03	2.08	6.4741**
4	Suitability	3.73	2.75	4.1569**
5	Labour requirement	3.25	3.35	1.1809 <sup>NS</sup>

xx significant at 1% level of probability  
NS non-significant



**Fig. 8 Mean scores of the farmer respondents on perception of the innovation-characteristics**

- A. Complexity
- B. Cost
- C. Profitability
- D. Suitability
- E. Labour requirement

 Participant farmer

 Non-participant farmer

It is evident from Table 20 that there was significant difference between the participant and the non-participant farmers in perceiving all the five innovation-characteristics except labour requirement. A comparison of mean scores indicated that the participant had better perception about the innovation-characteristics of the minikit varieties of rice (Figure 8).

#### 5. Evaluation of the procedure of conducting Rice Minikit Trials

The procedure of conducting Rice Minikit Trials was evaluated by comparing the responses tendered by both the extension personnel and the participant farmers as given in Table 21.

The following conclusion could be deciphered from the data presented in Table 21.

While all the extension personnel had vouched that had provided insight regarding the objectives of the trial to the participant farmers, only 16.67 per cent of the farmers agreed to have received it.

Table 21. Comparison of responses of the extension personnel and the participant farmers in evaluating the procedure of conducting Rice Minikit Trials.

Sl. No.	Procedural requirement	Yes				No			
		Extension personnel (n=30)		Participant farmers (n=60)		Extension personnel (n=30)		Participant farmers (n=60)	
		f	%	f	%	f	%	f	%
1	Providing insight regarding objectives of the trial	30	100.00	10	16.67	0	0.00	50	83.33
2	Providing assurance on quality of the seed	4	13.33	8	13.33	26	86.67	42	70.00
3	Providing literature along with the kit	0	00.00	0	0.00	30	100.00	60	100.00
4	Providing information on package of practices of the variety.	28	93.00	13	21.67	2	6.67	47	78.33
5	Providing assistance in laying out the plot	30	100.00	11	18.33	0	0.00	49	81.67
6	Making visits and giving guidance in time	30	100.00	16	26.67	0	0.00	44	73.33
7	Taking observations in time	30	100.00	12	20.00	0	0.00	48	80.00
8	Putting a board in the trial plot	1	3.33	0	0.00	29	96.67	60	100.00
9	Bring non-participants to the trial plot	4	13.33	4	6.67	26	86.67	56	93.33
10	Taking photographs	2	6.67	0	0.00	28	93.33	60	100.00
11	Conducting meetings	7	23.33	1	1.66	23	76.67	59	98.33
12	Conducting field days	4	13.33	0	0.00	26	86.67	60	100.00
13	Recording the yield data	30	100.00	28	46.87	0	0.00	32	53.33
14	Recording farmers' reaction	30	100.00	28	46.67	0	0.00	32	53.33
15	Doing follow up.	6	20.00	2	3.37	24	80.00	58	96.67

f frequency  
% percentage



13.33 per cent of the extension personnel said that they had ensured the quality of the seed before supplying it to the participant farmers. But a large majority of the participant farmers (86.67 per cent) said that they did not get any such assurance.

Neither the extension personnel nor the participant farmers agreed to have received any literature concerned with the package of practice recommendations for the variety along with the kit.

While 93.73 per cent of the extension personnel said that they had provided information regarding the package of practices recommended for the variety being supplied, only 21.67 per cent of the farmers accepted that they had got it.

With respect to providing assistance to the participant farmers in laying out the plot though the entire sample of extension personnel claimed to have done it, only 18.33 per cent of the participant farmers supported it.

Only 26.67 per cent of the participant farmers agreed to have received any on-the-spot guidance from the visiting extension personnel while, 100 per cent of the extension personnel had opined in the affirmative.

80 per cent of the participant farmers denied the claim expressed by the entire group of the extension personnel that they had taken timely observations at the different stages of the trial.

With respect to putting a board in the trial plot, a meagre 3.3 per cent of the extension personnel said they had done it. All other participant farmers agreed to disagree with it.

As far as the procedural requirements like bringing the non-participant farmers to the trial plots and conducting meetings, the percentages of the extension personnel who had responded positively were 13.33 and 23.33 respectively. The corresponding figure for the participant farmers were just 6.67 and 1.66, respectively.

Regarding conducting field days none of the participant farmers opted to support the positive response made by the extension personnel who happened to be a mere 13.33 per cent.

The claim made by all the extension personnel that they had recorded the yield data as well as farmers' reaction was refused by 56.30 per cent of the participant farmers.



6. Constraints experienced by the extension personnel and the participant farmers in conducting the Rice Minikit Trials.

6.1. Constraints experienced by the extension personnel in conducting the Rice Minikit Trials.

The major constraints experienced by the extension personnel in conducting the Rice Minikit Trials are presented in Table 22. These constraints are ranked on the importance with which they were felt.

It was found that the most important constraint experienced by the extension personnel was absence of Rice Minikits being supplied in time.

The constraints next in importance were absence of any literature on package of practices for the minikit rice variety being supplied along with the kit and the lack of any provision for giving financial assistance or other inputs like fertilizer, pesticide etc. along with the kit.

The other important constraints in the order of importance were poor quality of seeds supplied, quality of seeds now supplied being inadequate, too many programmes being implemented at the same time and instruction to give preference to small and marginal farmers while selecting beneficiaries.

Table 22. Constraints experienced by the extension personnel in conducting Rice Minikit Trials.

Sl. No.	Constraints	cumulative index frequency of response	Rank
1	Kits not supplied in time.	3.00	1
2	Absence of literature on package of practices recommendations of the variety, along with the kit.	2.87	2.5
3	No provision to give financial assistance / additional inputs along with the kit.	2.87	2.5
4	Poor quality of seeds.	2.80	4
5	Quantity of seeds not sufficient.	2.33	6
6	Instruction to give preference to small and marginal farmers while selecting the participants.	2.33	6
7	Too many programmes being implemented simultaneously.	2.33	6
8	Instruction to select only those who have not participated earlier.	1.60	8
9	Lack of supply of farmer's reaction cards.	1.57	9
10	Difficulty in finding out beneficiaries.	1.30	10

6.2. Constraints experienced by the participant farmers in conducting the Rice Minikit Trials.

The important constraints faced by the participant farmers in carrying out the Rice Minikit Trials are listed in Table 23. These constraints are ranked based on the importance with which they were felt.

Out of the 14 constraints experienced by the participants as given in Table 20, two constraints were equally placed as the most important ones. They were lack of minikits being supplied in time and lack of timely guidance and supervision by the extension personnel.

Three constraints together were ranked as next in importance. They were, absence of other inputs being supplied along with the kit, lack of information regarding the package of practices for the variety and poor quality of the seeds supplied.

Lack of information regarding the characteristics of the variety supplied was found to be the next important constraint faced by the participant farmers.

Insufficiency of quantity of seeds supplied and lack of follow up were ranked as the other important constraints.

Table 23. Constraints experienced by the participant farmers in conducting Rice Minikit Trials.

Sl. No.	Constraints	cumulative index frequency of response	Rank
1	Supply of kits not timely	2.97	2.5
2	Lack of timely guidance and supervision	2.97	2.5
3	Lack of information regarding package of practices recommendations of the variety	2.85	4
4	Poor quality of seeds.	2.85	4
5	Other inputs not being supplied	2.85	4
6	Lack of information regarding characteristics of the variety	2.82	6
7	Quantity of seeds not sufficient	2.70	7.5
8	Lack of follow-up	2.70	7.5
9	Variety not palatable	2.40	9
10	Risk involved	2.23	10
11	Lack of incentives	2.03	11
12	High cost of fertilizers	1.62	12
13	Incidence of pests and diseases	1.48	13
14	Lack of sufficient rains	1.20	14

# ***DISCUSSION***

## 5. DISCUSSION

The important results of the study are discussed in this chapter under the following broad sub heads.

1. Analysis of the characteristics of the participant and the non-participant farmers.
2. Analysis of the adoption behaviour of the participant and the non-participant farmers.
3. Relationship between the farmers' characteristics and the adoption of recommended practices by them.
4. Analysis of the perception of the farmers about the innovation-characteristics of the Minikit Rice varieties.
5. Evaluation of the procedure of conducting Rice Minikit Trials and
6. Constraints experienced by the Extension personnel and the participant farmers in conducting the Rice Minikit Trials.

1. Analysis of the characteristics of the participant and the non-participant farmers.

But for one characteristic viz. cosmopolitaness, the participant farmers differed significantly from the non-participant farmers. This was clearly indicated by the results in Tables 3-10.

A brief discussion on each of the selected characteristics brings forth some interesting insights.

As far as the socio-economic status was concerned the participant farmers differed significantly from the non-participant farmers, a result which was conducive enough to reject the hypothesis that there would be no significant difference between the participant farmers and the non-participant farmers with respect to their socio-economic status.

But a critical examination of the distribution of the respondents indicates a possible breach of instructions in selecting the beneficiaries.

As per the instructions, preference was to be given for small and marginal farmers while selecting the beneficiaries. The distribution of the respondents showed that the percentage of farmers belonging to the high socio-economic group was more in the case of the participant farmers. Had the said instruction been strictly followed, it is obvious that the distribution would have been just the reverse. In this context, it must also be noted that the above mentioned instruction was pointed out as one of the important constraints by the extension personnel (Table 22).

The next characteristic namely extension orientation registered the highest significant difference between the participant and the non-participant farmers. The percentages of respondents having medium as well as high levels of extension orientation were more among the participant farmers. This can be considered as a commendable consequence accruing to the participant farmers for having participated in the Rice Minikit Trials.

Thus, the hypothesis that there would be no significant difference between the participant and the non-participant farmers with respect to their extension orientation was rejected.

Cosmopolitaness was the only characteristic which the participant as well as the non-participant farmers had anything in common with. The non-significant difference exhibited by the characteristic led to the acceptance of the hypothesis that there would be no significant difference between the participant and the non-participant farmers with respect to their cosmopolitaness.

The increasing trend among Kerala farmers irrespective of whether they have participated in Rice Minikit Trials or not, becoming more cosmopolitan is pregnant in this result.



With respect to mass media participation there was significant difference between the participant and the non-participant farmers. The percentages of respondents having medium and high mass media participation were more in the case of the participant farmers. Their higher socio-economic status might have contributed to this finding.

Hence, the hypothesis that there would be no significant difference between the participant farmers and the non-participant farmers with respect to their mass media participation was rejected.

Since significant difference was noticed in the case of scientific orientation of the participant and the non-participant farmers, the hypothesis that there would be no significant difference between the two sets of respondents with respect to their scientific orientation was rejected. It can be argued that the high socio-economic status and mass media participation of the participants would have made tangible contributions in pepping their scientific orientation up.

The participant farmers, as expected, had a higher crop yield index than the non-participants, difference being

highly significant. This was indicated by the distribution data shown in Table 6. Participation in the trials would have enabled them to achieve higher yields.

So, the hypothesis that there would be no significant difference between the participant farmers and the non-participant farmers with respect to their crop yield index was rejected.

Regarding management orientation, significant difference was noticed between the participant and the non-participant farmers. Those having high management orientation were more among the participant farmers.

Thus, the hypothesis that there would be no significant difference between the participant and the non-participant farmers with respect to their management orientation was also rejected.

## 2. Analysis of the adoption behaviour of the participant and the non-participant farmers.

The results shown in Table 12 and Figure 3 indicate that the mean adoption score of the participant farmers was significantly higher than that of the non-participant farmers. The findings is in line with that of Swaminathan (1986) and Sankaran (1987).

Though there is nothing illogical to rely on this seemingly gratifying result in rejecting the hypothesis that there would be no significant difference between the participant and the non-participant farmers with respect to their adoption of the recommended practices, a critical analysis of the results in Table 11 and 13 cautions one to construe it as the significant impact of the Rice Minikit Trials.

An examination of Table 13 and Figure 4 reveals that the mean score was maximum in the case of adoption of the variety with the score being higher for the participant farmers. This is due to the fact that since the adoption of Minikit variety was bestowed the highest score, all the participant farmers, being the recipients of the minikits, got the score three and the non-participants got it as either one (for local variety) or two (for high yielding variety) enabling the former to gain an edge over the latter.

This can be further explained if a comparison is made between the adoption of other practices especially soil testing and seed treatment which surprisingly showed the least difference between the participant and the non-participant farmers.

So also are the cases with the adoption of liming as well as the application of fertilizers and Plant Protection chemicals. The extent to which the participant and the non-participant farmers differed along these aspects was almost the same.

Had the participant farmers shown a higher significant difference along these practices also, the impact of the Trial found to be significant could be treated as unalloyed.

In this context, it is meaningful to make a closer look at the distribution of the participant and the non-participant farmers according to their adoption of the recommended practices as presented in Table 11.

Compared to the participant farmers the non-participant farmers were constituted by a higher percentage of them belonging to the medium level of adoption. Those having low adoption level were more among the participant farmers.

The asymmetry shown by the participant farmers over the extension personnel in evaluating the procedure of conducting the trials should also be taken note of here (Table 21).

Similar to the observation made by Goswami (1988) in the case of Wheat Minikit Trials, the performance of the participant farmers was thus found to be quite unsatisfactory in many areas of adoption such as seed treatment, soil testing etc.

Thus an unbiased deliberation along these lines makes it obligatory to say that the impact of Rice Minikit Trials was only partial with respect to the adoption of recommended practices.

### 3. Relationship between the farmers' characteristics and the adoption of recommended practices by them.

All the seven selected characteristics were found to be positively and significantly related with the adoption of recommended practices by the participant farmers. So, the hypothesis that there would be no significant relationship between the selected characteristics of the participant farmers and their adoption of recommended practices was rejected.

In the case of the non-participant farmers all the characteristics except management orientation were having

positive and significant relationship with the adoption of recommended practices. Thus the hypothesis that there would be no significant relationship between the selected characteristics, save management orientation of the non-participant farmers, and their adoption of recommended practices was rejected.

The relationship of each characteristic on the adoption level of respondents is separately discussed below.

Socio-economic status of both the participant farmers and the non-participant farmers was positively and significantly related to their adoption of recommended practices.

The high social and economic status enables the farmers to take more risks in adopting the innovations in crop cultivation. Higher education, income, material possession, farm size etc. help them to utilize these resources for effective crop production.

The above finding is similar to that of, Kamble (1973), Vellapandian (1974), Supe and Salode (1975), Somasundaram (1976), Vijayaraghavan(1977), Pathak et al (1979), Manivannan (1980), Prakash (1980), Ravichandran

(1980), Naik (1981), Voh (1982), Sushama et al (1981), Vijayakumar (1984), Jayakrishnan (1984), Sangle (1984), Cherian (1984), Sreekumar (1985), Rameshbabu (1987), Lakshmanan (1987), Mahadevaiah (1987), Ramegowda and Siddaramiah (1987), Syamala (1987), Anithakumari (1989), Sajeevchandran (1989), Satheesh (1990), Kumar and Waswik (1990), Bhoite and Girase (1991) and Grewal and Sohal (1991).

Extension orientation was positively and significantly associated with the participant farmers' adoption behaviour. It showed positive and significant relationship with that of the non-participant farmers also.

Extension orientation is an important component in the agricultural production process. This provides functional and purposive information on agriculture to the clientele. Contacts with the extension personnel and participation in various extension activities motivate the farmers leading to the final adoption of the improved practices.

Similar findings were reported by Jha and Sharma (1972), Bhaskaran (1979), Dudhani et al (1987), Sankaran (1987), Goswami (1988), Olowu et al (1988), Singh et al (1988), Krishnamoorthy (1988), Reddy and Reddy (1988), Gowd

(1988), Syamala (1988), Rajagopal (1991) and Hanchinal et al (1991) etc.

Cosmopolitanness was found to have positive and significant relationship with the level of adoption of both the categories of farmers. With the increase in the number of outside contacts, the farmers get more oriented towards the acceptance of innovations.

The significant relationship of the above characteristic and the farmers' adoption of improved practices was also reported by Anbalagan (1974), Karim and Mahboob (1974), Ariffin (1975), Vijayakumar (1983), Mahadevaiah (1987) and Olowu et al (1988).

There was positive and significant relationship between mass media participation of the participant farmers and their adoption of the recommended practices.

The messages they received through the mass media would have convinced the farmers about the advantages in the adoption of the improved cultivation practices, which may be the reason behind this result.



The result obtained is in line with that reported by Singh and Singh (1970), Mahadevaswamy (1978), Bhaskaran (1979), Balasubramanian (1980), Sohi and Kherde (1980), Haraprasad (1982), Sanoria and Sharma (1983), Balasubrahmaniam (1985), Godhandapani (1985), Sankaran (1987), Jaiswal and Sharma (1990), Satheesh (1990) and Umale et al (1991) etc.

Scientific orientation of both the groups of farmers was found to have positive and significant relationship with their adoption behaviour. The possession of a scientific outlook, at a time when science and technology has carved ubiquitous eminence, is a basic necessity for farmers in order to reap the fruits of innovative researches at a faster and more efficient pace. This result is in agreement with those reported by Reddy and Kivlin (1968), Palaniswamy (1978), Aristotle (1981), Jayakrishnan (1984), Jayapalan (1985), Wilson and Chaturvedi (1985), Prasannan (1987), Reddy and Reddy (1988), Anithakumari (1989), Sajeevchandran (1989) and Umale et al (1991).

The results concerned with the relationship between crop yield and the adoption behaviour of the respondents indicate that it was positive and significant in the case of

farmers. The positive relationship between these two characteristics could be traced to the mutual influence between them. When adoption was high it resulted in higher crop yields and when crop yields were higher farmers went in for continued use of the technology in the coming seasons so as to stabilise the high crop yields they obtained earlier. Channegowda (1991), Sinha and Kotle (1974), Samantha (1977), Ramalingagowda (1978), Bhaskaran (1979), Rannorey (1979), Sreekumar (1985), Mahadevaiah (1987) and Syamala (1988) also reported similar trend.

Management orientation showed positive and significant relationship with the adoption of recommended practices by the participant farmers. It indicated that the participant farmers had better ability to make wise decisions in planning, production and marketing so as to put to practice the improved and profitable technologies. But the relationship between this characteristic and the adoption behaviour was found to be non-significant though positive in the case of the non-participant farmers.

The significant relationship resulted was in conformity with the findings of Samantha (1977), Shanmukhappa (1978), Bhaskaran (1979), Sheshachar (1980),

Renukaradhya (1984), Sreekumar (1985), Syamala (1988) and Saed (1989).

Multiple regression analysis done to find out the extent of variation in the respondents' characteristics and adoption of recommended practices evinced some interesting points worth discussing.

Among the seven characteristics studied, the characteristics namely extension orientation, mass media participation and crop yield index were found to have significant influence on the adoption behaviour of both the participant and the non-participant farmers.

Results of the path analysis indicated that the highest direct effect towards the adoption of recommended practices by the participant farmers was due to their crop yield index (Table 17 and Figure 6). Other characteristics of these respondents viz. socio-economic status, extension orientation, cosmopolitaness, mass media participation and management orientation also noticed substantial indirect effect through this characteristic.

In the case of the non-participant farmers also the results were the same. But in their case, crop yield index also channelled substantial indirect effects of extension

orientation, mass media participation and management orientation (Table 18 and Figure 7).

The yield potential plays a significant role in making the farmers accept and adopt a new variety. It is evident from the above discussion that farmers would be ready to cultivate a variety if they are convinced about its capacity to produce more.

It was seen that two characteristics namely extension orientation and mass media participation were also having significant influences in the adoption behaviour of both the participant and the non-participant farmers.

Thus, it is befitting to recommend these three characteristics namely crop yield index, extension orientation and mass media participation as those capable of etching an indelible impact by way of accentuating the present rate of adoption of recommended practices by both the participants and the non-participant farmers if manoeuvred diligently in future courses of action.

Another salient finding in this context was the failure of the characteristic cosmopolitanism in registering any significant influence so as to vary the rate of adoption

by either the participant farmers or the non-participant farmers. So it can be deduced that only little importance need be given to this characteristic while chalking out alternate strategies to improve the adoption level.

Socio-economic status had the maximum indirect effect in causing variation in the adoption rate of the participant as well as the non-participant farmers. This points out to the significance of socio-economic status of the farmers in determining their adoption of improved agricultural technology. It must be borne in mind that improved agricultural technology warrants substantial monetary investments which could be afforded only by economically well-off farmers. Therefore, there is no surprise in the finding that socio-economic status had maximum indirect effect on the adoption rate of farmers in the present study.

Based on the above discussion, the hypothesis that there would be no significant contribution of the selected set of characteristics in the variation in the adoption of recommended practices was rejected with respect to extension orientation, Crop yield index and mass-media participation of the participant as well as the non-participant farmers.

The same hypothesis was accepted in the case of the rest of the characteristics namely socio-economic status, cosmopolitaness, scientific orientation and management orientation of the participant farmers and the non-participant farmers.

4. Analysis of the perception of farmers about the innovation-characteristics of the Minikit Rice Varieties.

The perception of the farmers about the innovation-characteristics plays a major role in the spread and acceptance of a new variety. The results of the analysis done in this regard as shown in Tables 19 and 20 threw light on the impact of the Minikit Trials too. Among the five innovation-characteristics analysed the labour requirement of the Minikit variety was perceived to be non-significant. It can be concluded that the spread of Minikit varieties is no way hampered by the amount of labour required for their cultivation. The requirement of labour was perceived to be more or less equal in the cultivation of paddy irrespective of the variety being used.

The most striking innovation-characteristic perceived in the case of Minikit varieties was their profitability. Altogether, more than 95 percent of the

participating farmers, perceived the cultivation of minikit varieties as profitable (Table 19). That, farmers perceive Minikit varieties as lucrative itself is a portentous indicator telling much on their acceptance among the farmers. Most often, it is the element of profit inherent with an innovation that holds the sway in taking a decision to accept it. The Minikit variety is no exception.

The Minikit varieties were perceived to be suitable to the locality. It indicates that these varieties were not incompatible with the agro-climatic peculiarities prevailing in the area. This is again another sign that augurs well in appreciating their acceptance among farmers.

But the cost as well as difficulty incurred in the cultivation were perceived to be high in the case of Minikit varieties. It is a known fact that the cost of cultivation of high yielding varieties due to their high fertilizer response and gullibility to diseases and pests is more than that of local varieties. The improved varieties also demand meticulous attention and care during their different critical stages of growth. These restrictions make the farmers feel the cultivation of Minikit varieties not as easy as in the case of local varieties. Possibility of

major constraints as explained in Table 23 acting a role cannot be rejected in this context.

5. Evaluation of the procedure of conducting Rice Minikit Trials.

Results of the evaluation of the procedure of conducting the Minikit Trials as shown in Table 21 provide some interesting moot points.

The tincture of repudiation endorsed by the participant farmers on many of the procedural requirements constrains one to take the complacency expressed by the extension personnel only with a pinch of salt. The extent of disagreement shown by the participant farmers and the extension personnel in their responses, although anticipated, is quite glaring.

The successful implementation of any extension programme necessitates that the participants or beneficiaries in that programme must be made aware of its aims and objectives. But in the case of Rice Minikit Trials, though all the extension personnel had claimed that they had briefed the participants in this regard, only less than 20 percent of the participants agreed to have received such insight from the extension personnel.



It is considered as the duty of the extension personnel to ensure that only certified seeds are supplied to the participants. Only 13 percent of the extension personnel said that they could ensure this. The reason alleged was that, as the lot of seeds for supply was, most often, coming not in time, that too in bulks, its quality was to be taken for granted and it was not practical to await the results of a germination test. The fact that the extension personnel were not provided with any facilities to conduct such tests if at all time permitted cannot be overlooked.

Both the extension personnel and the participant farmers were in unison to deny being provided with any literature describing the package of practices recommendations for the variety along with the kit. This was due to the simple reason that the instructions in this regard was not at all followed in the State. This can be considered as a major flaw which the higher officials should not fail to take cognizance of while implementing the programme. It is also to be noted that this lacuna was highlighted as a major constraint by the extension personnel and the participant farmers.

It is of paramount importance that the farmers doing the trials should know the package of practices recommendations for the variety supplied. This could be accomplished by the extension personnel either at the time of supplying the kit or during the visits which they were supposed to make frequently. But the results tell an altogether different story. What one can make out of the responses put forth by majority of the participant farmers, along these fronts, against the claim of fulfilment indicated by the extension personnel is a sombre picture of apathy and lukewarm attitude exhibited by the very persons whose responsibility was to conduct the trials well.

This was true with respect to the assistance being given by the extension personnel while laying out the plots also.

It is also relevant in this context to point out that the lack of timely guidance and supervision was indicated as one of the major constraints felt by the participants (Table 23).

To augment the demonstrative aspects of the trials, the extension personnel are required to do some specific activities like putting a board in the trial plot, bringing non-participant farmers to the plot, taking photographs,

conducting meetings or field days etc. Though a very few extension personnel were able to do this, majority of the participant farmers observed that no such thing was done to their knowledge.

This again points to some serious lapses on the part of the extension personnel. When asked about the probable reasons for this, majority of the extension personnel put the onus on the lack of enough time to attend the trials singlemindedly and lack of financial provisions to carry out different activities designed to serve the purpose of a demonstration.

Similarly, while all the extension personnel said that they had recorded the yield data as well as the farmers' reactions, more than half of the participant farmers refused to support it. The farmer's reaction towards the performance of the variety is very much essential in evaluating the acceptance of the variety supplied. It is mainly based on his reaction, that the future of the variety, especially when it is a pre-release one, such as whether or not it should be supplied next season after large scale multiplication is determined.

The yield parameter is also important in influencing the acceptance and spread of the variety among farmers.

Though negligence on the part of the higher officials in supplying sufficient number of farmers' reaction cards was pointed out as a deterrent in this context, allowing to miss such vital information would help only to tarnish the well-thought-out-objectives of the Minikit Trial programme.

In a situation, where the snags rule the roost, no wonder that precious little could be done by way of follow up measures like making suitable arrangements to supply seeds of varieties found to have acceptance and consequently having demand in the next season. This key element in ensuring sustained adoption should have been given the importance it deserved.

6. Constraints experienced by the extension personnel and the participant farmers while conducting the Rice Minikit Trials.

A perusal of Tables 22 and 23 reveal that certain constraints were considered as major ones both by the

extension personnel and the participant farmers. These constraints are put to discussion first.

The participant farmers were in full agreement with the extension personnel to highlight the kits not being supplied in time as the most important constraint. It was observed that in many cases the kits were supplied either late or even towards the fag end of a season, putting the extension personnel as well as the participant farmers into much difficulty.

For eg. the extension personnel could not strictly follow the guidelines in conducting the trials as they were overwhelmed with the task of achieving the physical targets allotted, for which they had to somehow clear the bulk of seeds at the earliest. It is enough to say that this constraint alone would suffice to exonerate many of the lapses which are believed to have played havoc while conducting the trials. This also resulted in the reported misutilisation or wastage of the seeds done by some farmers.

The absence of accompanying literature explaining the package of practice recommendations for the variety and lack of provision to give financial assistances or inputs

along with the kit were considered as the next major constraints by the extension personnel.

The availability of information on package of practices recommendation is all the more important if the variety supplied is a pre-release one. Bereft of the necessary information, there are chances that the farmer may adopt the same recommendations to the minikit variety also as he was to use in the case of the main variety. If the main variety happens to be a local variety it would, no doubt, seriously affect the yield realised out of the Minikit variety resulting in the erosion of his confidence and subsequent rejection of the new variety.

The lack of provision to supply inputs like fertilizers, pesticides etc. along with the kit was considered as a major constraint by the participant farmers also (Table 21). Certainly farmers would be more interested to participate in the trials if necessary inputs are also supplied along with the kit.

Poor quality of the seeds was considered as another important constraint both by the extension personnel and the participant farmers.

This points towards the need of improving the quality of seeds supplied by way of taking proper measures either during procurement or at the time of disbursement of the lot.

Constraints like quantity of seeds not sufficient, instruction to give preference to small and marginal farmers while selecting the participants, and too many programmes being implemented simultaneously were equally ranked as the third major constraint by the extension personnel.

The quantity now supplied is only four kilogram. This was felt as inadequate by the participant farmers also. A suggestion to increase the quantity can be made only juxtaposing the instruction to give preference to small and marginal farmers while selecting participants. It is a matter demanding deeper analysis like whether an increase in the quantity could be afforded by the small and marginal farmers whose resources especially land are limited.

It is an oft-repeated complaint made by the extension personnel that they are overburdened with a plethora of schemes and programmes being implemented through Krishi Bhavans. The problem according to them is exacerbated by the lack of sufficient staff and

administrative facilities which also invariably put stumbling blocks in the conduct of the programme under consideration.

The other major constraints, in the order of importance assigned like instruction to select only those who have not participated earlier as beneficiaries, no provision for feedback like supply of farmer reaction cards and difficulty in finding out beneficiaries by the extension personnel, were no less the constraint hierarchy by the extension personnel, were no less relevant. Similarly, the other constraints raised by the participant farmers like lack of information regarding the characteristics of the variety, variety not palatable and risk involved in conducting the trial also did not lack pertinence.



# ***SUMMARY AND CONCLUSION***

## 6. SUMMARY AND CONCLUSION

The centrally sponsored Rice Minikit Trials Programme, aimed at the popularisation of High Yielding Varieties of rice is being implemented in Kerala State from 1968 onwards. Yet, no systematic and objective research study evaluating its impact on the adoption behaviour of farmers has been conducted so far.

The present study was an attempt to fill this lacuna. The specific objectives of the study were as given below.

1. To assess the impact of Rice Minikit Trials on the adoption behaviour of the participant and the non-participant farmers.
2. To examine the influence of various characteristics of farmers on the adoption behaviour.
3. To analyse the perception of the participant and the non-participant farmers about the innovation - characteristics of Minikit rice varieties.
4. To evaluate the procedures followed in conducting Rice Minikit Trials.
5. To study the constraints faced by the participant

farmers and the extension personnel in conducting Rice Minikit Trials.

The investigation was carried out in Kollam District, which was found to have the maximum number of Minikit Trials considering the total area under paddy cultivation in each of the 14 districts in the State. From each of the two Subdivisions in the district 15 Krishi Bhavans were randomly selected. From each Krishi Bhavan, two participant and two non-participant farmers were selected randomly. All the Agricultural Officers were also included for the study. Thus the study had a total sample size of 150 respondents, consisting 60 each of participant and non-participant farmers and 30 Agricultural Officers. Socio-economic status, Extension orientation, Cosmopolitaness, Mass media participation, Scientific orientation, Crop yield index and Management orientation were selected as independent variables based on review of literature as well as opinion of experts. Adoption of the selected six cultivation practices recommended for Minikit varieties formed the dependent variable. An attempt was made to analyse the perception of the participant and the non-participant farmers about the five selected innovation-characteristics of the Minikit varieties. The procedure of conducting the Minikit Trials was evaluated and the

constraints experienced by the participant farmers as well as the extension personnel in conducting these trials were studied.

Regarding the measurement of the variables, Socio economic status was measured using the scale developed by Venkataramaiah (1983) with slight modification in the scoring procedure. Extension orientation was measured using the method followed by Bhaskaran (1979) after making appropriate modifications. The method suggested by Desai (1981) was used for measuring cosmopolitaness. The extent of mass media participation was quantified using the procedure used by Anantharaman (1977). The scale developed by Supe (1969) was used to measure scientific orientation. Crop yield index and management orientation were measured using the corresponding methods developed by Samantha (1977).

The Adoption Behaviour of the participant and the non-participant farmers was measured using the scale developed by Singh and Singh (1974) after making slight modifications to suit the purpose. The cultivation practices were selected based on the popularity of them as common practices and the opinion of the Project Leader as well as Subject Matter Specialists.

An interview schedule finalised after pretesting was used for collecting data from the farmer respondents, while data from the Extension personnel were obtained through a questionnaire. The schedule was translated into Malayalam for use in the field. The data were subjected to simple correlation analysis, multiple correlation and regression analysis, Path analysis and Mann - Whitney's U test. Percentages were also used for making simple comparisons.

The salient findings of the study are summarised and presented below.

1. The study revealed that majority of the participant and non-participant farmers belonged to medium category with respect to their characteristics. There was significant difference between the participant and the non-participant farmers with respect to these characteristics.
2. Regarding the adoption of recommended practices, majority of the participant and non-participant farmers belonged to the medium category. The percentage of farmers having high level of adoption was more in the case of the participant farmers.

3. The level of adoption of recommended practices by the participant farmers was significantly higher than that of the non-participant farmers.

4. Correlation studies revealed that there was positive and significant relationship between all the seven characteristics (socio economic status, extension orientation, cosmopolitaness, mass media participation, scientific orientation, crop yield index and management orientation) and the adoption of recommended practices by both the participant as well as the non-participant farmers.

5. Multiple regression analysis indicated that 73 per cent and 79 per cent variation in the adoption of recommended practices by the participant farmers and non-participant farmers respectively, were due to the selected seven characteristics.

6. Results of Path analysis showed that Crop yield index had the highest direct effect on the adoption behaviour of both the participant and non-participant farmers. The indirect effects of this variable were mainly routed through extension orientation and socio-economic status in the case of the participant farmers while they were through extension orientation and mass media participation in the case of the non-participant farmers.

7. The analysis of the perception of the farmers about the innovation - characteristics revealed that profitability was the most striking innovation-characteristic as far as the Minikit varieties were concerned. The requirement of the labour was perceived to be more or less equal in the cultivation of paddy irrespective of the variety.

8. The evaluation of the procedures of conducting Rice Minikit Trials revealed that most of the procedural requirements were not being fulfilled satisfactorily.

9. The participant farmers reported the following as the major constraints experienced in conducting the trials. 'kits not being supplied in time', 'lack of timely guidance and supervision', 'lack of information regarding the package of practices recommendations of the variety', 'other inputs not being supplied' and 'poor quality of seeds'.

10. The major constraints felt by the extension personnel in conducting the Rice Minikit Trials were 'kits not being supplied in time', 'absence of literature on package of practices recommendations of the variety along with the kit, 'lack of provision to give financial assistance or additional inputs along with the kit', 'poor quality of seeds', 'too many programmes being implemented simultaneously', 'quantity of seeds given not sufficient'

and 'instruction to give preference to small and marginal farmers while selecting beneficiaries'.

11. Following are some of the suggestions for improving the modus operandi of the Programme.

1. It should be ensured that the Minikits are supplied in time. Proper measures must be taken to eradicate the bottlenecks rampant in this regard.

2. The current practice of supplying the seeds in bulk to the Krishi Bhavans must be discarded and they must be supplied in separate kits.

3. Each kit must be invariably supplied with a leaflet in Malayalam explaining the characteristics of the variety and its package of practices recommendations.

4. The extension personnel should be given prior training regarding the cultivation practices, varietal characteristics, susceptibility to particular pests and diseases if any etc. of the varieties supplied well in advance before disbursing the kits.

5. The participant farmers may be provided with additional inputs like fertilizer, pesticide, etc. along with the kit.



6. Progressive farmers should not be discouraged from taking part in the trials.
7. Financial provision must be sanctioned to carry out activities that boost the demonstrative aspects of the trials.
8. The proposal to increase the quantity of seeds now supplied must be given due consideration.
9. The performance of the extension personnel in charge of conducting the trials must be scrutinised periodically.
10. Sufficient number of Farmer's reaction cards must be supplied to the extension personnel in time.

To conclude, the impact, the Rice Minikit Trials had engendered on the adoption behaviour of the farmers, though not worth being gloated over, was satisfactory. More sincere and diligent efforts from the officials concerned with the implementation of the programme will render the realization of its coveted objectives not an insurmountable task, for which, it is earnestly hoped that the results of the present investigation would be of much help.

Suggested future lines of work

The present investigation can be further elaborated along the following lines.

1. Conduct longitudinal studies in other districts of the State also.
2. Study the spread and acceptance of different Minikit Varieties of rice over a period of time, in different locations.
3. Experimental studies on a 'before and after design' can be attempted.
4. Include more independent variables.
5. Conduct similar studies with respect to other Minikit crops like pulses, coconut etc.

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\* Original not seen.

# *APPENDICES*

Appendix 1. Table showing the criteria adopted in categorising participant farmers and non-participant farmers according to their characteristics

Sl. No.	Characteristics	Participant farmers (n=60)					Non-participant farmers (n=60)				
		Mean	SD	Low	Medium	High	Mean	SD	Low	Medium	High
1.	Socio-economic status	20.18	6.36	<13.81	13.81-26.54	>26.54	16.47	3.38	<13.09	13.09-19.85	>19.85
2.	Extension orientation	02.83	0.87	<1.96	1.96- 3.7	> 3.7	00.79	0.73	< 0.06	0.06-1.52	> 1.52
3.	Cosmopolitaness	5.86	1.19	<4.67	4.67- 7.05	> 7.05	6.05	1.32	< 4.73	4.73-7.37	> 7.37
4.	Mass media participation	12.43	2.87	<9.56	9.56-15.30	>15.30	10.22	2.25	< 7.97	7.97-12.47	>12.47
5.	Scientific orientation	16.53	1.67	<14.86	14.86-18.20	>18.20	14.85	1.25	< 13.6	13.6-16.09	>16.09
6.	Crop yield index	130.75	5.56	<125.19	125.19-136.31	>136.31	123.50	2.92	<120.6	120.6-126.4	>126.40
7.	Management orientation	31.83	2.38	<29.45	29.45-34.21	>34.21	30.48	3.74	<26.74	26.74-34.22	>34.22

Appendix - 2

INTERVIEW SCHEDULE (FOR FARMER-RESPONDENTS)

Date :  
Serial No :

1. Name of the respondent :
2. Address :
3. Ward :
4. Panchayat :
5. Block :
6. Age :
7. Total area owned :
8. Total area cultivated :

Further details:

Sl.No	Crops	Area	Yield
1.			
2.			
3.			
4.			
5.			
6.			
7.			

## 1. SOCIO-ECONOMIC STATUS

1. Occupation : No occupation  
Unskilled  
Semiskilled  
Skilled  
Farming  
Professional
2. Land holding : No land  
Less than one acre  
One to five acre  
More than five acre
3. Annual Income : Rs. 1200 - Rs. 1800  
Rs. 1801 - Rs. 2400  
Rs. 2401 - Rs. 3500  
Rs 3501 - Rs. 4800  
Rs 4801 and above.
4. Education : Illiterate  
Functionally literate  
Primary School  
Middle School  
High School  
College.
5. Socio- Political participation:
- Without any official position in socio-political organisation.
  - Official position in one or more organisation.
  - Functional contribution or raising fund for common work.
  - Active office bearer.
  - Involvement in community work.

6. Possessions :

- None
- One farm animal (bullock, buffalo, cow)/Cycle/Furniture.
- Two farm animals/bullock cart/radio.
- Three to four farm animals/improved farm implement /
- Five to ten farm animals/gobar gas plant/ pumpset.
- More than ten farm animals/ tractors/ automobile.

7. House :

Shed thatched / mud wall & tiled / Brickwall & tiled /  
Concrete house / Concrete & double storied.

8. Household:

Small  
Medium  
Large  
Very Large  
Special features.

2. EXTENSION ORIENTATION

- A. Frequency of meeting with Extension personnel.  
two / more a week / once in a week / once to  
thrice a month / never.
- B. Frequency of participating in extension activities like  
meetings, Farmer's days, demonstration etc.  
  
Never / Not attending all the activities whenever  
conducted / Attending all the activities whenever  
conducted.

3. COSMOPOLITENESS

- a. How many times do you visit the nearby town?  
Never / Once in a month / Once in a fortnight / Once  
in a week / Two or more a week.

- b. Purpose of visit.  
 Entertainment / Other purposes / Personal or  
 Professional / Agricultural.
- c. Membership in organisation outside the village  
 Non member / Member.

4. MASS MEDIA PARTICIPATION

Medium	Frequency
Radio	Daily Two to six days a week Once a week Once a fortnight Rarely Never
News paper	Daily Two to six days a week Once a week Once a fortnight Rarely Never
Magazines, Leaflets and bulletins	Regularly Occasionally Never
Films (Seen during last year)	More than six Four to six One to three None
Field days/agricultural functions (attended during last year)	More than six Four to six One to three None



## 5. SCIENTIFIC ORIENTATION

Please indicate ( \_/ ) the degree of your agreement or disagreement or undecidedness with each of the following statements.

Statements	Agree	Undecided	Disagree
1. New methods of farming give better results to a farmer than old methods.			
2. The way of farming by our forefathers is still the best way to farm today.			
3. Even a farmer with lot of farm experience should use new methods of farming.			
4. A good farmer experiments with new ideas in farming.			
5. Though it takes time for a farmer to learn new methods in farming it is worth the efforts.			
6. The traditional methods of farming have to be changed in order to raise the standard of living of a farmer.			

## 6. MANAGEMENT ORIENTATION

What is your opinion about the following statements ?  
Please indicate ( \_/ ) your agreement or disagreement with each of the statements given below.

a. Planning orientation:

1. Each year one should think afresh about the crops to be cultivated in each type of land.
2. It is not necessary to make prior decision about the variety of crop to be cultivated.
3. The amount of seed, fertilizers and plant protection chemicals needed for raising a crop should be assessed before cultivation.
4. It is not necessary to think ahead of the cost involved in raising a crop.
5. One need not consult any agricultural expert for crop planning.
6. It is possible to increase the yield through farm production plan.

b. Production orientation:

1. Timely planting of a crop ensures good yield.
2. One should use as much fertilizer as he likes.
3. Determining fertilizer dose by soil testing saves money.
4. For timely weed control one should even use suitable herbicides.
5. Seed rate should be given as recommended by the specialists.
6. With low water rates one should use as much irrigation water as possible.

c. Marketing orientation:

1. Market news is not so useful to a farmer.
2. Farmer can get good price by grading his produce.

3. Warehouse can help the farmer to get better price for his produce.
4. One should sell his produce to the nearest market irrespective of price.
5. One should purchase his inputs from the shop where his relatives purchase.
6. One should grow those crops which have more market demand.

EXTENT OF ADOPTION OF RECOMMENDED CULTIVATION PRACTICES OF PADDY.

a. Variety:

1. Have you cultivated high yielding variety YES/NO  
If yes, name the variety
  - 1.
  - 2.
  - 3.
2. Area under coverage.

b. Seed treatment:

- Have you done seed treatment YES/NO  
If Yes,
1. Name of the chemical used
  2. Quantity of the chemical used
  3. Quantity of seed treated
  4. Method of seed treatment.

c. Soil testing.

- Did you test your soil YES/NO  
If yes,

1. Quantity of soil collected
2. Place of collection of soil
3. Time (season) of collection

d. Liming

1. Did you apply lime/ dolomite? YES/NO  
If Yes,

Based on soil test data

Quantity      Time

Lime

Dolomite

Not based on soil test data

Lime

Dolomite

e. Use of chemical fertilizers:

- Did you apply fertilizers ? YES/NO  
If yes,

Based on soil test data

Basal dose      Top dressing      Total

Nitrogen

Phosphorous

Potassium

Not based on soil test data;

Nitrogen

Phosphorous

Potassium

f. Use of plant protection chemicals:

Was there any pest/disease attack in your crop during the last season YES/NO

If yes  
Name of the pest                      Chemical used                      Dosage

Name of the disease                      Chemical used                      Dosage

II. PERCEPTION OF INNOVATION-CHARACTERISTICS OF MINIKIT VARIETIES OF RICE. (To be collected from the participant farmers.)

1. Please give your opinion as to whether it is difficult to cultivate Minikit varieties of paddy or not.

Very easy --- Easy --- Neither easy nor difficult  
- Difficult --- Very difficult.

2. In your opinion how much costly is the cultivation of Minikit varieties of paddy ?

Very low --- Low --- Neither low nor high --- High  
----Very high.

3. In your opinion how much profitable is the cultivation of Minikit varieties of paddy ?

Most profitable --- Profitable --- Somewhat profitable  
--- Least profitable --- Not at all profitable.

4. To what extent do you consider the cultivation of Minikit varieties of paddy is suitable in your farming situation keeping in view the resources available at your disposal, type of soil, labour availability, source of irrigation etc.,

Most suitable --- Suitable --- Somewhat suitable  
--- Least suitable --- Not at all suitable.

5. What will be the labour requirement for cultivation of Minikit varieties of paddy when compared to cultivation of local varieties of paddy ?

Much more --- Little more --- No difference --- Less labour  
--- Much less labour.

PART II

TO EVALUATE THE PROCEDURE IN THE CONDUCT OF MINI KIT TRIALS

( To be collected from participant farmers only)

1. Did the AO/AA give you any insight or briefing regarding the objectives of the Mini Kit Trials Programme ? (Yes/No)
2. Did you get any literature (eg. leaflet) describing the package of practices for the variety supplied ? (Yes/No)
3. Did you get any assurance regarding the quality of the seed ?  
(Yes/No)
4. While laying out the plot did you get the assistance of AO/AA ?  
(Yes/No)
5. Please give the following details regarding the plot size

Location

Season

6. Did you get technical assistance regarding the package of practices during the cultivation ?

If yes, please furnish the following details.

1. Source of information
2. Aspects on which you received advices

7. Did the Extension personnel pay visit to your plot ?  
If yes, please furnish the following details

1. Type of the Extension Personnel

2. Frequency of visit

3. Purpose of visit

1. to give you advices ( details)

2. to take observations (details)

8. Did the extension personnel do any of the following things ?  
If yes, give details :

1. Put a board in your plot

2. Bring other farmers to your plot

3. Take photographs

4. Conduct field day

5. Conduct group meeting

6. Any related activity

9. Did the AO/AA collect yield data from you ?

10. Did the AO/ AA approach you to know your reaction regarding the performance of the Minikit variety ?

11. Are you satisfied with the performance of the minikit variety ?

12. Did you use the minikit variety in the next season ? If not, why ?

13. What were the difficulties you came across while conducting the Trial ? Make your reaction in the appropriate column.



No	Difficulty	Most important	Important	Least important
1.	Supply of kits not timely			
2.	High cost of fertilizers			
3.	Lack of follow-up			
4.	Other inputs not being supplied			
5.	Lack of timely guidance and supervision.			
6.	Lack of sufficient rains			
7.	Lack of information regarding package of practices of the variety.			
8.	Poor quality of seeds			
9.	Lack of information regarding characteristics of the variety.			
10.	Quantity of seeds not sufficient			
11.	Incidence of pests and diseases			
12.	Lack of incentives			
13.	Variety not palatable			
14.	Risk involved in conducting the trial.			

14. Please give your suggestions to improve the Programme :

Appendix -3.

QUESTIONNAIRE FOR EXTENSION PERSONNEL

Date :  
Place :

1. Name
2. Official Address

Kindly indicate your responses, as required

1. Which among the following types of farmers do you select as participants to the programme ? ( please rank your preference)
  - (1) small and marginal farmers
  - (2) Progressive farmers
  - (3) Farmers who have taken part in the programme earlier
  - (4) Others
2. Do you seek the help of Karshika Vikasana Samithi in the selection of participants ? (Yes/No)
3. Do you maintain a registrar of the beneficiaries ? (Yes/No)
4. Do you display the names of the participants, in your office ? (Yes/No)
5. Do you assist the participants in laying out the plot (Yes/No)
6. Do you visit the trial plot ? If yes,
  - (1) Frequency
  - (2) Purpose
7. Do you give technical guidance to the participants (Yes/No)  
If yes give details

8. Do you make observations from the trial plot ?  
If yes, what are the observations do you make?
9. Do you make the participants aware of the objectives of one Trial ? (Yes/No)
10. Do you give relevant information regarding POP while supplying the kit ? (Yes/No)
11. Do you ensure the quality of the seed before supplying it to the farmer ?
12. Do you obtain the reaction of the participant farmer regarding the performance of the variety ? (Yes/No)
13. Do You conduct any of the following activities so as to serve the purpose of demonstration ? Give ( \_/ ) mark

Put a board in the trial plot / Arrange farmers visits / Take photographs / Conduct field day / Conduct group meeting / any other related activity.

Following are some of the constraints perceived while conducting Minikit Trials. Kindly go through these and make your responses by putting ( \_/ ) mark in the appropriate column.

Sl. No.	Constraint	Most Important	Import- ant	Least Important
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1. Kits not supplied in time
2. Absence of literature on package of practices of the variety, attached along with the kit
3. Difficulty in finding out beneficiaries
4. Poor quality of seeds.
5. No provision for feedback like supply of Farmers' reaction cards.
6. Quantity of seeds not sufficient
7. Instruction to give preference to small and marginal farmers while selecting participants.

8. Too many programmes being implemented simultaneously.
9. No provision to give financial assistance / inputs along with the kit.
10. Instruction to select only those who haven't participated earlier.

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14. Please list out your suggestions to improve the Rice Minikit Trials Programme.

- 1.
- 2.
- 3.

# **IMPACT OF RICE MINIKIT TRIALS ON THE ADOPTION BEHAVIOUR OF FARMERS**

**BY**

**RAMACHANDRAN, C.**

**ABSTRACT OF THE THESIS  
SUBMITTED IN PARTIAL FULFILMENT OF  
THE REQUIREMENT FOR THE DEGREE  
MASTER OF SCIENCE IN AGRICULTURE  
(AGRICULTURAL EXTENSION)  
FACULTY OF AGRICULTURE  
KERALA AGRICULTURAL UNIVERSITY**

**DEPARTMENT OF AGRICULTURAL EXTENSION  
COLLEGE OF AGRICULTURE  
VELLAYANI  
THIRUVANANTHAPURAM**

**1982**

## ABSTRACT

With a view to study the impact of Rice Minikit Trials on the adoption behaviour of farmers the present investigation was undertaken under the title "Impact of Rice Minikit Trials on the Adoption Behaviour of Farmers". Impact was measured in terms of the adoption of the selected recommended practices by the participant farmers and the non-participant farmers. The farmer's perception about the innovation-characteristics of Minikit Varieties of Rice, the procedures followed in conducting Rice Minikit Trials, and the constraints faced by the participant farmers and the extension personnel were also analysed.

The study was conducted in Kollam district. The sample consisted of 60 each of randomly selected participant farmers and non-participant farmers and 30 Agricultural Officers. Data were collected using interview schedule and suitable statistical techniques were employed in the analysis of the data.

The study revealed that the participant farmer's adoption of the recommended practices, though partial in some aspects, was significantly affected by the Rice Minikit Trials.

The selected independent variables together contributed significantly in the variation in the adoption behaviour of both the participant as well as the non-participant farmers.

The analysis of the perception of the farmers about the innovation - characteristics revealed, profitability as the most striking innovation-characteristic of the Minikit varieties of Rice. The evaluation of the procedures of conducting Rice Minikit Trials showed that most of the procedural requirements were not being fulfilled satisfactorily. The results of the constraint analysis pointed out that timely supply of kits, literature on package of practices recommendations of the variety along with the kit and timely guidance and supervision were given the least attention. The results point out to the need for proper planning and improvement in every step in the conduct of the Trials to reach its cherished goals.