AN ANALYSIS OF THE EFFECTIVENESS OF NATIONAL DEMONSTRATIONS CONDUCTED BY THE KERALA AGRICULTURAL UNIVERSITY

BY
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DECLARATION

I hereby declare that this thesis entitled, "An Analysis of the Effectiveness of National Demonstrations Conducted by the Kerala Agricultural University", 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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Vellanikkara,
9 March, 1988.

CERTIFICATE

Certified that this thesis entitled, "An Analysis of the Effectiveness of National Demonstrations Conducted by the Kerala Agricultural University" is a record of work done independently by Smt. Syamala, K.S., under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

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INTRODUCTION

I. INTRODUCTION

Agriculture in India is in the process of transformation, being accelerated by the recent developments in the field of agricultural research. Best use of available land with the improved technologies of crop husbandry is inevitable for rapid agricultural development. Although many a feasible innovation are available in the field of agriculture, the absorption of these technologies by the farmers leaves much to be desired. Hence it can be stated that in India, it is not the technology which is lacking but its application in the field by the millions of farmers.

Various extension education methods and approaches have been launched and utilised to enable the research results to reach the farmers' fields. Demonstrations help to educate and convince the farmers since they involve observing, learning by doing and experiencing. Successful demonstrations invariably lead to the adoption of the improved methods and techniques, bringing about desirable changes in the behaviour of farmers.

Result demonstration has been a powerful means of teaching improved techniques since 1903, when

Dr. Seaman A.Knapp revealed its effectiveness through his demonstration on cotton boll weevil control near Terrel in Texas, U.S.A. Since 1928, result demonstration has been acknowledged as an effective medium of extension education in India when the Royal Commission on Agriculture first recommended the 'Ocular demonstrations'. But later, it has undergone a series of changes in its theory and nature of execution. With the introduction of high yielding varieties, result demonstrations became the most important channel for the transfer of technology on high yielding varieties among farmers.

In 1967 the Indian Council of Agricultural Research took up the National Demonstration Program under the title "All India Co-ordinated Project on National Demonstration on Major Food Crops". During the Fifth Five Year Plan, sanction was accorded for demonstrations in 50 agriculturally intensive districts in the country. The main objective of these demonstrations was to convince the farmers about scientific farming by demonstrating the high production potentialities of every unit area of land with the adoption of high yielding varieties together with the practices recommended for them. It was also meant to bring the agricultural scientists in direct

contact with the farmers so that the good and bad points of the high yielding varieties are identified.

The Kerala Agricultural University (KAU) has been implementing the National Demonstration Program in Trichur district from 1975 to 1983 with headquarters at Mannuthy. During June 1983, the program was shifted to Quilon district with headquarters at Sadanandapuram. The program is being implemented under the direct supervision and guidance of scientists of the University.

Need for the study

The effectiveness of National Demonstration Program is said to be the key to the success of improved agricultural technologies. However, experience has shown that even in the areas where National Demonstrations have been conducted, the bulk of the farmers have not yet adopted the package of practices and the high yielding varieties. Even the National Demonstration farmers were found to have relapsed to traditional agricultural practices once the scheme was withdrawn. Moreover, the package itself seems to have undergone dilution during the process of adoption. It is assumed that the impact of National Demonstrations on the knowledge, attitude

neighbouring farmers will vary depending on a number of factors such as the farmers' characteristics, methodology followed in conducting the demonstrations etc. So far, no systematic study has been conducted to assess the impact of the National Demonstration Program in Quilon district. A comparative study on the differential impact of National Demonstrations on the knowledge, attitude and adoption behaviour of farmer-demonstrators and neighbouring farmers in Quilon district, will, therefore, be of immense use in streamlining the future program. The study will also help in the identification of the constraints in conducting National Demonstrations which when surmounted could lead to the effective implementation of the program in the ensuing years.

Objectives of the study

The study has been designed with the following specific objectives:

1. To ascertain the effectiveness of National Demonstrations in the knowledge about, attitude towards and adoption of the demonstrated practices, by the farmer-demonstrators and the neighbouring farmers in Quilon district.

2. To find out the attitude of the farmer-demonstrators and the neighbouring farmers towards the National Demonstration Program.

3. To find out the perception of the farmer-demonstrators and the neighbouring farmers about the methodology followed in the conduct of National Demonstrations.

4. To analyse the constraints, if any, experienced by the farmer-demonstrators in conducting National Demonstrations.

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 all the 46 paddy demonstration farmers were covered, due to the limitation of both resources and time, it was rather impossible to cover a large number of neighbouring farmers around the National Demonstration plots. Further, paddy alone was considered for the study, though a number of crops were included under the demonstration program. However, sincere efforts are taken to make the study as systematic and objective as possible.

THEORETICAL ORIENTATION

II. 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. This will also help in operationalising variables enabling data collection on the problem under investigation. In accordance with the objectives of the present study, the review of literature is furnished on the following lines.

1. Concept of Demonstrations
2. Concept of National Demonstrations
3. Effectiveness of National Demonstrations
4. Factors affecting the effectiveness of National Demonstrations.
5. Perception of farmers about the methodology followed in the conduct of National Demonstrations.
6. Constraints experienced by farmer-demonstrators in conducting National Demonstrations.
7. Theoretical concepts and operational definitions of the selected variables.
8. Hypotheses formulated for testing in the study.

1. Concept of Demonstrations

The concept of demonstrations underwent a change

with the beginning of the demonstrations at the Porter's D Farm, Terrel, Texas, USA.

Demonstration has been recognised over the years as one of the important extension methods and occupies a very important position in the extension program. As an educational tool, it is used to demonstrate the tested procedures and techniques, their applicability to local conditions and superiority over local practices and techniques, and to help the farmer to learn by seeing and hearing and learning by doing and experiencing things for himself.

Garg (1961) stated that demonstration is the foundation stone of extension teaching and it is based on 'show me idea', showing how to do a demonstration.

Strow (1968) opined that a demonstration is a way to show how to do something clearly and carefully, that a farmer can practise what the extension worker had demonstrated.

1.1. Types of demonstrations

Several extension education specialists like Leagans (1951), Gilbertson and Gallup (1957), Ramkrishan

(1965) and others classified demonstrations into two groups namely (i) method demonstrations and (ii) result demonstrations.

1.1.1. Method demonstrations

Leagans (1951) defined method demonstration as 'a short-time demonstration given before a group to show how to carry out an entirely new practice or an old practice in a better way'.

Ramkrishan (1965) defined method demonstrations as those in which a new method or technique is demonstrated, taught or given practise of.

According to Sandhu et al. (1970), a method demonstration is one which is oriented to show how to carry out a new practice or to improve a skill. The combination of seeing and hearing makes a strong impression and gets further strengthened by practise through participation in the demonstration.

1.1.2. Result demonstrations

A result demonstration is a demonstration conducted by a farmer, home-maker or other persons under the direct supervision of an extension worker to prove the advantage

of a recommended practice or combination of practices. It involves careful planning, a substantial period of time, adequate records and comparison of results.

Leagans (1951) defined result demonstration as a way of showing the people the value of a new practice. He also stated that such demonstrations require substantial period of time.

According to Gilbertson and Gallup (1957), a result demonstration is one designed to teach others, in addition to the person who conducts the demonstration.

Kelsey and Hearne (1965) defined result demonstration as a method of teaching designed to show by example the practical application of an established fact or groups of related facts.

Ramkrishan (1965) stated that result demonstrations are those in which two practices or techniques are compared for results. Of the two practices thus compared, one is an improved one and the other local or existing.

1.2. Effectiveness of demonstrations

Demonstration has been viewed as a powerful tool in Agricultural Extension by many authors. Ensminger

and Sanders (1945) stated that result demonstration is the foundation stone in extension teaching and is specially useful in the introduction of improved agricultural practices, where the farmers will have the opportunity to see for themselves the performances of the improved practices over the old.

Barewar (1957) reported that 87 percent of farmers were influenced by crop demonstrations.

Khan et al. (1965) stated that a carefully conducted result demonstration is the most convincing proof of the value or worth of an innovation and builds confidence among farmers to adopt new practices in preference to their own. They further stated that result demonstration is an effective educational tool which forms the basis of agricultural improvement in a village.

According to Ramkrishan (1965), demonstration is one which helps to convince people quicker than any other method, through the triple processes of observing, hearing and learning by doing and experiencing things for oneself. It initiates a process of learning, motivates and encourages one to change his old habits, customs, traditions and practices and thereby helps to build a favourable attitude.

He further stated that the process of demonstration is a complete one, beginning with awareness of the need for change and ending in adoption in actual practise.

Sharma (1966) observed that demonstrations served as information source for over 50 percent of farmers for adopting improved farm practices.

Singh and Dikshit (1966) stated that the effectiveness of large scale demonstrations increases from awareness to trial, but falls at adoption stage.

The literature reviewed above emphasize the importance of demonstration as an effective tool in Agricultural Extension.

2. Concept of National Demonstrations

National Demonstration is viewed as a composite type of result demonstration that has remained as a potent extra force in the intensive agricultural programs. It is a demonstration conducted by farmers on their plot under the direct supervision and guidance of scientists to show the potential of science in increasing farm yields.

According to Ramaiah (1965), the main objective

of National Demonstrations is to raise the production level to the maximum extent which will make the farmer to realise what the production potentialities are. He further observed that National Demonstration is an opportunity as well as challenge to the research workers to show what they can do for raising agricultural production.

Ramkrishan (1965) stated that the main factor of National Demonstration Program was to educate and orient the farmers on the objectives and details of demonstrations.

Swaminathan (1966) maintained that National Demonstrations are not only the possibilities for increasing the yield greatly, but the hybrid varieties can exert a catalystic effect on the minds of farmers and induce them to adopt the new practices.

Kanwar (1969) stated that National Demonstration Program aims at demonstrating the maximum yield potential of unit area taken under the program by adopting two, three or even four crop rotations during the agricultural year.

Thus, the concept of National Demonstration was introduced with an objective to convince the farmers

about the production potentiality of unit area of their land in unit time and bring the agricultural scientists in direct contact with the farmers.

3. Effectiveness of National Demonstrations

3.1. Effectiveness of National Demonstrations on the level of knowledge of farmers about improved agricultural practices

Radhakrishnamoorthy (1969), after studying the impact of National Demonstration Program conducted in Andhra Pradesh, reported that majority of the farmers were aware of National Demonstrations, over 42 percent had knowledge about the crops grown during National Demonstration period, about 50 percent of them knew the demonstrator and only 12 percent of the farmers had knowledge about the purpose of National Demonstration.

Jha and Sharma (1972), from their study on the perception of National Demonstrations by specialists, extension personnel and demonstrating farmers, found that all the respondents were aware of the implementation of National Demonstration Program in Rajasthan. All of them understood the concept of National Demonstrations. Over 30 percent of the demonstrator-farmers opined that the change in their knowledge about the improved practices

was to a great extent due to the National Demonstrations.

Singh and Singh (1974) reported that the respondents from the villages where National Demonstrations were conducted had significantly higher knowledge scores than those from the villages where no National Demonstration was conducted.

Supe and Salode (1975) observed that the National Demonstrations conducted by the change agents were effective in increasing the level of knowledge about improved agricultural practices of the participant-farmers who were educated, scientifically oriented and had high socio-economic status.

Ravikumar (1978) conducted a study to assess the impact of National Demonstration on farmers of Dharwar district in Karnataka State. He found that there was significant difference in the knowledge levels of participant and non-participant farmers of the program with reference to improved agricultural practices.

Pathak et al. (1979) indicated that the difference in the levels of knowledge between farmer-demonstrators and neighbouring farmers in relation to the improved practices of jute and wheat crops was highly significant;

but in the case of rice cultivation it was not significant.

In his study on the impact of National Demonstration Program on paddy cultivation in Trichur district, Kamarudeen (1981) found that the neighbouring farmers of the demonstrated plots were superior to the control farmers in respect of their level of knowledge about the demonstrated practices.

Nikam and Singh (1984) found that the level of knowledge about improved agricultural practices of the tribal farmers who participated in the National Demonstration in Dhulia district of Maharashtra was superior to that of the non-participant tribal farmers.

The study of Hirevenkanagoudar et al. (1984) revealed that the participant farmers of the National Demonstrations had significantly higher knowledge about the demonstrated practices than the non-participants.

All the above results show that National Demonstration is an effective medium in increasing the knowledge level of farmers about the improved agricultural practices.

3.2. Effectiveness of National Demonstrations on the attitude of farmers towards the demonstrated practices

Very few studies have been conducted to measure

the attitude of farmers towards the practices demonstrated in the National Demonstration Program. These studies are epitomised as follows:

Singh and Singh (1974) found that the farmers of the treated (National Demonstration) villages had more favourable attitude towards high yielding varieties of wheat than their counterparts of the control villages.

Pathak et al. (1979) reported that there was significant difference in the attitude of farmer-demonstrators and neighbouring farmers towards multiple cropping followed in National Demonstration Program.

Kamarudeen (1981), from his study, found that the neighbouring farmers were superior to control farmers in their attitude towards the demonstrated practices.

National Demonstration was found to be highly effective in creating favourable attitudes among farmers towards the demonstrated practices, as revealed by the above studies.

3.3. Effectiveness of National Demonstrations on the extent of adoption of the demonstrated practices

Rao (1971), after conducting a study on the impact

of National Demonstrations on farmers of selected villages in East Godavari district of Andhra Pradesh, found that there was significant difference in the extent of adoption of improved practices between the farmers of the demonstration villages and adjacent villages. He found that majority of the farmer-demonstrators had exhibited medium level of adoption whereas low level of adoption was prevalent among non-participant farmers.

Jha and Sharma (1972) observed that around 80 percent of the farmers had adopted the new practices recommended to them through the National Demonstration conducted in the preceding season. Similarly, 80 percent of the adopters felt that their decision to adopt the recommended practices was influenced mainly by these demonstrations.

Singh and Singh (1974) found that the percentage of adopters was more in the National Demonstration village than in the control village, and the difference in the mean adoption scores of the two categories was significant.

Oliver et al. (1975) reported that 62.50 percent of the farmers who participated in the cultural operations in the plots had adopted one or more of the practices recommended for the crop.

Supe and Salode (1975) reported that National Demonstrations were effective in helping the scientifically oriented farmers in the adoption of demonstrated farm practices.

The study of Behera and Sahoo (1975) revealed that out of the 118 farmers interviewed, only five had adopted the demonstrated practices fully, while 32 had partially adopted the demonstrated practices.

Ravikumar (1978) found that there was significant difference in the adoption levels of participant and non-participant farmers of National Demonstration Program with reference to improved agricultural practices.

Pathak et al. (1979) reported that the difference in the adoption levels was significant between the farmer-demonstrators and neighbouring farmers in relation to improved practices of jute, paddy and wheat crops.

Kamarudeen (1981) found that the neighbouring farmers of the National Demonstration plots were superior to the other farmers in relation to their extent of adoption of the recommended practices of paddy.

Nikam and Singh (1984), from their study, found

that the adoption level of tribal farmers who participated in National Demonstrations was superior to that of the non-participant tribal farmers.

Kebey et al. (1984) also reported that the National Demonstrations were very successful and effective in communicating improved agricultural technologies to tribal farmers and also in increasing their adoption of improved technologies.

The above studies reveal that National Demonstrations were much effective in increasing the farmers' level of adoption of the demonstrated practices.

3.4. Effectiveness of National Demonstrations on the attitude of farmers towards the program

There were no direct studies reported on the above aspect. However, a few studies relating to the attitude of farmers towards some agricultural development programs and agencies are reviewed hereunder.

Mani and Knight (1981) reported that there was significant difference between the mean scores of the participant turmeric growers and the non-participant turmeric growers in their attitude towards Regulated Market.

Ramalingam (1981) found that more than 60 percent of the respondents had more favourable attitude towards Regional Rural Bank.

From a critical analysis of the adoption of Dryland Technology, Srinivasan (1981) found that nearly one-half of the marginal farmers, small farmers and big farmers showed the most favourable attitude towards Dryland Technology. About 55 percent of the marginal farmers, 50 percent of the big farmers and 41 percent of the small farmers showed more favourable attitude.

Since there are no closely related studies and in the light of the above references, it was assumed that the National Demonstrations would be effective in creating a favourable attitude among the farmers towards National Demonstration Program.

4. Factors affecting the effectiveness of National Demonstrations

Effectiveness of National Demonstrations, in terms of the farmers' knowledge about, attitude towards and adoption of demonstrated practices and their attitude towards National Demonstration Program was conceptualised as being influenced by a number of factors such as age,

socio-economic status, mass media participation, cosmopoliteness, extension orientation, crop yield index, economic performance index, scientific orientation, management orientation, rationality in decision-making, innovation-proneness and communication skill of the farmers. Since there was paucity of direct studies examining the influence of such factors on the effectiveness of National Demonstrations, results of other closely related studies available on these lines have also been organized and presented as follows:

4.1. Factors affecting the effectiveness of National Demonstrations in terms of knowledge of farmers about the demonstrated practices

4.1.1. Age

Behera and Sahoo (1975) reported that young farmers had better knowledge and information about the National Demonstrations than other farmers.

Somasundaram and Singh (1978) found that age was negatively and significantly associated with knowledge in the case of adopter-small farmers while it had non-significant correlation with the knowledge of non-adopter small farmers.

Kaleel (1978), from his study of the impact of Intensive Paddy Development Units in Kerala, found that age had no significant relationship with the knowledge gained by farmers about the subject matter.

Menon and Prema (1978) reported that age was significantly related to gain in knowledge and retention of knowledge by rural women due to their participation in training camps.

Vijayaraghavan and Somasundaram (1979), Ahamed (1981) and Sushama et al. (1981) reported non-significant relationship between age and knowledge.

Manivannan (1980) found negative and significant relationship between age and knowledge level of sunflower growers. Chandrakandan (1982) observed a similar result in the case of farm broadcast listeners and Senthil (1983) also found that age had negative and significant association with the knowledge level of hybrid cotton seed growers.

Vijayakumar (1983), from his study on the impact of Special Agricultural Development Units (SADU), reported that age of the non-beneficiaries had negative and significant relationship with their level of knowledge.

The study by Godhandapani (1985) revealed negative and significant association between age and knowledge of farmers about nutrient recommendation for groundnut.

Since most of the recent studies have pointed out to the negative and significant association of age with farmers' knowledge level, it would be of interest to test the validity of these results in the present study also.

4.1.2. Socio-economic status

Somasundaram and Singh (1978) found that socio-economic status had non-significant correlation with knowledge in the case of both adopter and non-adopter small farmers.

Vijayaraghavan and Somasundaram (1979) reported positive and significant association between socio-economic status of marginal farmers and their level of knowledge about the high yielding varieties of paddy.

Manivannan (1980) reported that socio-economic status had no significant relation to knowledge level of sunflower growers. Sushama et al. (1981) also reported a similar trend. They found non-significant correlation between socio-economic status and knowledge of tribal

people about modern living practices in both more developed and less developed areas.

Senthil (1983) reported negative and significant association between socio-economic status and knowledge level of hybrid cotton seed growers.

Based on the above studies, it was assumed that socio-economic status would influence the level of knowledge about the demonstrated cultivation practices and hence this variable was selected for the study.

4.1.3. Mass media participation

Sohal and Tyagi (1978) found positive and significant correlation between mass media exposure and knowledge of farmers about dairy innovations.

Manivannan (1980) conducted a study on the knowledge and extent of adoption of sunflower growers and found positive and significant correlation between mass media exposure and knowledge level of sunflower growers.

Haraprasad's (1980) study on the impact of the agricultural programs implemented by the Small Farmers' Development Agency (SFDA) among farmers in Trivandrum district revealed positive and significant association of

mass media participation with level of knowledge of beneficiaries. Similar findings were indicated by Chandrakandan (1982) among listeners of farm broadcasts, Senthil (1983) among hybrid cotton seed growers, and, among groundnut cultivators by Godhandapani (1985).

Since all the recent studies have pointed out to the positive and significant correlation of mass media participation with farmers' knowledge of improved practices, it would be of special interest to study the association of this variable with the knowledge of farmers about the cultivation practices demonstrated under National Demonstration Program.

4.1.4. Cosmopoliteness

Somasundaram and Singh (1978) found that localite-cosmopolite value orientation was not significantly associated with knowledge of adopter and non-adopter small farmers.

Vijayaraghavan and Somasundaram (1979) reported significant correlation between localite-cosmopolite value orientation of marginal farmers and their knowledge of high yielding varieties of paddy.

Kamarudeen (1981) indicated non-significant

association of cosmopoliteness with knowledge of farmers about the demonstrated cultivation practices of paddy.

Positive and significant correlation between these two variables was observed in the study by Vijayakumar (1983) among beneficiaries and non-beneficiaries of the Special Agricultural Development Units, and by Viju (1985) among tribal farmers.

Since the earlier studies show varying results, it was felt necessary to put this phenomenon to further test in this study also.

4.1.5. Extension orientation

Somasundaram and Singh (1978) found that contact with extension agency was positively and significantly associated with knowledge of adopter-small farmers, but non-significant association was observed in the case of non-adopter small farmers.

Extension orientation had positive and significant correlation with knowledge level as observed by Vijayaraghavan and Somasundaram (1979) among marginal farmers, by Manivannan (1980) in the case of sunflower growers and by Kanagaraden (1981) among National Demonstration farmers.

Similar finding could be observed from the study of Haraprasad (1980) among the beneficiaries under the Small Farmers' Development Agency.

Chandrakandan (1982) found that contact with extension agency had no significant relationship with knowledge gain of the farm broadcast listeners.

Senthil (1983) and Godhandapani (1985) observed positive and significant relationship between farmers' contact with extension agency and their knowledge about the improved agricultural practices.

Based on the above studies, it was decided to test the relationship between extension orientation and knowledge of farmers about the demonstrated practices.

4.1.6. Crop yield index

No closely related study could be reviewed in this context. However, since effectiveness of National Demonstration, in terms of the knowledge of the farmers about demonstrated practices, is conceptually related to the crop yield index, this variable was included as an independent variable in the present study.

4.1.7. Economic performance index

Here again, no related literature could be traced. Since it was felt worth to test the influence of this variable on the knowledge level of farmers, it was included in the present study as an independent variable.

4.1.8. Scientific orientation

Supe and Salode (1975) reported that scientifically oriented participant farmers had higher knowledge about the demonstrated practices of jowar under the National Demonstration Program.

Vijayaraghavan (1977) found scientific orientation having significant relationship with knowledge of small farmers about high yielding varieties of paddy while it was found to have non-significant association with the knowledge of marginal farmers.

Somasundaram and Singh (1978) observed that scientific orientation had positive and significant association with knowledge of adopter small farmers, while it had no significant relationship with knowledge of non-adopter small farmers.

Knowledge of sunflower growers was found to possess

positive and significant correlation with their scientific orientation as reported by Manivannan (1980). Similar pattern of relationship was reported by Kamarudeen (1981), Senthil (1983) and Krishnamoorthy (1984).

Philip (1984) observed non-significant association between scientific orientation of the radio listening farmers and their knowledge about agricultural informations provided.

It was considered important to include this variable in the present investigation to test the validity of the above results.

4.1.9. Management orientation

Kamarudeen (1981) found that management orientation had positive and significant correlation with the level of knowledge of the farmers.

No more closely related studies were available for review. Based on the above study, it was assumed that management orientation of farmers would influence their level of knowledge of the selected practices followed under National Demonstrations and therefore, this variable was included in this study as an independent variable.

4.1.10. Rationality in decision-making

No study closely related to the contribution of this variable towards the level of knowledge of farmers could be reviewed. It was decided to include rationality in decision-making in the present investigation to test its influence on the knowledge level of farmers, since these two variables are conceptually related.

4.1.11. Innovation-Proneness

Only one study has been reported on the association of innovation-proneness with knowledge level of farmers.

Philip (1984) observed non-significant correlation between innovation-proneness and farmers' level of knowledge. In the light of this finding and considering the conceptual link between these two variables, it was decided to include innovation-proneness as an independent variable in the present investigation.

4.1.12. Communication skill

In the absence of any related studies, it was deduced that when a farmer's communication skill increases the knowledge to be possessed by him will also be high. To put in other words, a farmer with good communication skill has to

communicate more informations to others and for this he has to gather more knowledge about the improved agricultural practices. With this assumption, communication skill has been identified as an independent variable in this study.

4.2. Factors affecting the effectiveness of National Demonstrations in terms of attitude of farmers towards the demonstrated practices

4.2.1. Age

Prakash (1980) reported negative and significant association between age and attitude of tribal farmers towards settled agriculture.

Sushama et al. (1981) reported non-significant relationship between age of tribal people and their attitude towards modern living practices. A similar observation was noticed in the case of the farmers neighbouring the National Demonstration plots by Kamarudeen (1981).

Vijayakumar (1983) could find age having negative and significant correlation with attitude towards improved agricultural practices in the case of non-beneficiaries of Special Agricultural Development Units, but there was no significant relationship in the case of beneficiaries.

Philip (1984) reported non-significant influence of

age on attitude of farmers towards the program content of the agricultural information support provided through radio. A similar finding was obtained by Singh and Kunzroo (1985) in the case of farmers' attitude towards goat farming. But it showed negative and significant association with attitude of farmers towards sheep farming.

In the light of the above results, it would be interesting to explore the type of association between age of farmers with their attitude towards demonstrated practices under the National Demonstration Program.

4.2.2. Socio-economic status.

Singh and Singh (1970) reported that higher the socio-economic status, more favourable was the attitudes of farmers.

Socio-economic status was found to have positive correlation with farmers' attitude in the studies of Choukidar and George (1972) and Lokhande (1973).

Prakash (1980) could not find any significant association between socio-economic status and attitude towards settled agriculture among the tribal people of Kerala.

Pathak (1981) observed negative and significant

correlation between socio-economic status and attitude of farmers towards improved practices of jute cultivation.

Sushama et al. (1981) observed that socio-economic status had non-significant association with attitude of tribal people towards modern living practices.

Singh and Kunzroo (1985) reported positive and significant association between socio-economic status and attitude of farmers towards goat and sheep farming.

The above studies show wide variation in their results. Hence, it was decided to include this variable in the present investigation to test its influence on the attitude of farmers towards the demonstrated cultivation practices.

4.2.3. Mass media participation

Pathak (1981), from a multiple regression analysis of factors related with attitude of farmers, found that mass media contact had no significant association with attitude of farmers towards improved practices of jute cultivation.

Singh and Kunzroo (1985) reported that mass media exposure showed positive and significant correlation with

attitude of farmers towards sheep and goat farming.

In the absence of much related studies and based on the above studies, it was assumed that mass media participation would influence the attitude of farmers towards the demonstrated cultivation practices.

4.2.4. Cosmopoliteness

Kamarudeen (1981) reported non-significant association between cosmopoliteness and attitude towards the demonstrated practices of the farmers neighbouring to the National Demonstration plots, while among the control farmers the relationship was positive and significant.

Pathak (1981) observed that extra village contact had negative but non-significant relationship with attitude of farmers towards improved practices of jute cultivation.

Vijayakumar (1983) found that cosmopoliteness and attitude of both beneficiaries and non-beneficiaries of SADU towards improved coconut cultivation practices were positively and significantly correlated.

Viju (1985) found non-significant association between cosmopoliteness and attitude of tribal farmers towards improved agricultural practices.

In view of the above revelations, it was decided to include this variable as an independent variable in the study in order to assess its influence on the farmers' attitude towards demonstrated practices.

4.2.5. Extension orientation

Pathak (1981) concluded that extension contact had non-significant negative association with attitude of farmers towards improved jute cultivation practices.

Kamarudeen (1981) revealed that the attitude of farmers towards the demonstrated practices of paddy was positively and significantly associated with their contact with extension agencies.

Singh and Kunzroo (1985) reported non-significant correlation between farmers' extension contact and their attitude towards goat farming, while extension contact had positive and significant correlation with attitude of farmers towards sheep farming.

In the light of the above findings, it was decided to include extension orientation (extension contact and extension participation) as an independent variable in this study.

4.2.6. Crop yield index

There was no study available relating crop yield index with attitude of farmers towards improved agricultural practices. However, it seemed interesting to study the influence of crop yield index on farmers' attitude towards the demonstrated practices and hence, this variable was included in the study.

4.2.7. Economic performance index

No closely related study was available in this context also. However, it was decided to test and establish its relationship with the dependent variable since there appears to be conceptual relationship between these two variables.

4.2.8. Scientific orientation

Very few studies were available showing the relationship of this variable with attitude of farmers.

Kamarudeen (1981) reported positive and significant relationship between farmers' scientific orientation and their attitude towards demonstrated practices.

Philip (1984) found that there was no significant association between scientific orientation and attitude of

farmers towards the program content of the agricultural information support provided through radio.

Based on the above literature, it was decided to study and establish the influence of scientific orientation on attitude of farmers towards demonstrated practices.

4.2.9. Management orientation

Kamarudeen (1981) observed that there was positive and significant association between management orientation of farmers and their attitude towards demonstrated cultivation practices of paddy under the National Demonstration Program. Hence it was decided to test the validity of the above result in the present study.

4.2.10. Rationality in Decision-Making

No study was available relating this variable with attitude of farmers. However, it seemed rational to study and establish its association with the dependent variable.

4.2.11. Innovation-proneness

Philip (1984), from his study on the agricultural information support provided through radio to farmers by KAU, reported that innovation proneness had no significant

correlation with attitude of farmers towards the program content.

Based on the above finding, it was decided to study the influence of this variable on attitude of farmers towards demonstrated practices.

4.2.12. Communication skill

There was no closely related study showing the influence of this variable on attitude of farmers. Hence, it would be worth to find its association with the dependent variable.

4.3. Factors affecting the effectiveness of National Demonstrations in terms of farmers' adoption of the demonstrated practices

4.3.1. Age

Jha and Shaktawat (1972) found negative and significant correlation between age of farmers and their adoption behaviour.

Karim and Mahboob (1974), Sinha et al. (1974), Vellapandian (1974), Balasubramanian (1977) and Pal et al. (1977) established non-significant association between age and adoption behaviour of farmers. Their findings were

reinforced by Palaniswamy (1978), Ravi (1979), Segar (1979), Thankaraju (1979), Vijayaraghavan (1979) and Prakash (1980).

Contradicting the above results, Somasundaram (1976), Vijayaraghavan (1977), Pillai (1978), Balasubramanian (1980) and Manivannan (1980) came out with results showing negative and significant association between age of farmers and their adoption.

Sohi and Kherde (1980), Kamarudeen (1981), Sushama et al. (1981) and Singh (1983) reported non-significant relationship of age with adoption behaviour of farmers.

Vijayakumar (1983) reported negative and significant correlation between age and extent of adoption of improved practices by the non-beneficiaries of the SADU while in the case of beneficiaries the correlation was non-significant.

Yadav and Jain (1984) observed positive and significant association between age and adoption in the case of dairy farmers.

The study of Philip (1984) revealed that age had non-significant association with extent of adoption. Balasubramaniam and Kaul (1985) observed similar finding in the case of traditional fishermen in Kerala, and Nanjayan

(1985) among small farmers. Godhandapani (1985) and Wilson and Chaturvedi (1985) found negative and significant correlation of age with adoption behaviour of groundnut cultivators and tobacco cultivators, respectively. Based on the above studies, it was postulated that age may influence the adoption of demonstrated practices by the farmers.

4.3.2. Socio-economic status

Patel and Singh (1970) found that socio-economic status was significantly associated with acceptance of farm planning.

Jha and Sharma (1972) observed socio-economic status positively and significantly correlated with adoption behaviour of farmers growing hybrid bajra.

Somasundaram (1976) found no significant association between socio-economic status of small farmers with their adoption of new agricultural technology.

Vijayaraghavan (1977) reported positive and significant association between socio-economic status and adoption of high yielding varieties of paddy by small farmers. A similar finding resulted from the study on adoption behaviour of 'Malli' and 'Mullai' flower growing farmers by Palaniswamy (1978).

Socio-economic status was found to be positively and significantly correlated with adoption of sericulture technology by trained sericulturists, as reported by Thankaraju (1979). In the case of untrained sericulturists it showed no significant association.

Segar (1979), Manivannan (1980), Prakash (1980), Sinha and Sinha (1980) and Sohi and Kherde (1980) reinforced the positive and significant correlation between these two variables.

Sushama et al. (1981) in their study on the adoption behaviour of selected tribes of Kerala could observe that socio-economic status had positive and significant correlation with adoption in more developed area, whereas in the less developed area the relationship was not significant.

Singh (1983) studied the selected characteristics of farmers in relation to their adoption of farm mechanization and found that socio-economic status of farmers was significantly associated with their level of mechanization.

Sanoria and Sharma (1983) reported significant correlation of this variable with adoption in the case of T and V beneficiaries and the control group, while there was non-significant association in the case of Lab-to-Land beneficiaries.

Yadav and Jain (1984) also found that higher the socio-economic status of the farmers, greater was the tendency towards adoption of hybrid cattle.

Most of the recent studies have pointed out to the significant association of socio-economic status with farmers' adoption behaviour. Thus, it would be of use to test the validity of these results in the present exploration in relation to farmers' adoption of the demonstrated cultivation practices.

4.3.3. Mass-media participation

Singh and Singh (1970) conducted a multivariate analysis of adoption behaviour of farmers and found that there was positive and significant correlation between mass-media use and adoption behaviour of farmers. Media participation had significant association with adoption of the improved agricultural practices as reported by Vellapandian (1974).

The results of the above studies were reinforced by Mahadevaswamy (1978) among small, marginal and other farmers of Bangalore district, Palaniswamy (1978) among Malli flower growers, Bhaskaran (1979) in the case of farmers of more progressive village, and Ravi (1979) among tapioca growing farmers.

Segar (1979) reported positive and significant relationship between media participation and extent of adoption of members and non-members of farmers' discussion groups. Thankaraju (1979) observed similar finding among trained and untrained sericulturists.

Manivannan (1980) reported that mass media exposure had positive and significant correlation with extent of adoption of sunflower growers. His finding was supported by the studies of Balasubramanian (1980) and Sohi and Kherde (1980).

Mass media participation was found to have positive significant correlation with extent of adoption of the farmers under Small Farmers' Development Agency by Haraprasad (1982). Sanoria and Sharma (1983) could observe similar association among beneficiaries of farm development programs in Madhya Pradesh.

Tyagi and Sohal (1984), from their study on the factors associated with adoption of dairy innovations, found that in the case of rural farmers there was negative but non-significant association between media exposure and their adoption. But it was found to have positive and non-significant relationship with adoption in the case of urban farmers.

Jayakrishnan (1984) reported that mass media participation was positively and significantly associated with extent of adoption of low-cost technology among paddy growers.

Balasubramanian (1985), Godhandapani (1985), Jayapalan (1985) and Wilson and Chaturvedi (1985) also observed positive and significant correlation of farmers' extent of adoption with their mass media participation.

A contrasting result was observed in the study of Nanjayan (1985) wherein, mass media exposure was found to have no significant association with the small farmers' extent of adoption.

All the recent studies, save one, point out to the significant association of mass media participation with farmers' adoption behaviour. Hence, it was decided to test its relationship with adoption of the demonstrated practices under National Demonstration.

4.3.4. Cosmopoliteness

Karim and Mahboob (1974) reported that cosmopoliteness was positively and significantly correlated with adoption of fertilizers by transplanted Aman rice growers in rural areas of Bangladesh.

Pal et al. (1977), Mahadevaswamy (1978) and Bhaskaran (1979) also have indicated that farmers' cosmopoliteness had positive and significant influence on their adoption behaviour. But Vijayaraghavan (1977) reported non-significant association between the two characteristics.

Thankaraju (1979) found negative correlation between cosmopolite-localite value orientation and extent of adoption of trained and untrained sericulturists.

Kamarudeen (1981) also pointed out to the non-significant association between farmers' cosmopoliteness and their adoption of the demonstrated practices.

Vijayakumar (1983) observed positive and significant association of cosmopoliteness with the adoption of both beneficiaries and non-beneficiaries of the Special Agricultural Development Units. A similar trend was reported among beneficiaries of Farm Development Programs by Sanoria and Sharma (1983).

Viju (1985) reported non-significant association between cosmopoliteness and adoption of improved agricultural practices by the tribal farmers.

In the light of the above reports, it was decided to

study the influence of farmers' cosmopoliteness with their adoption of the demonstrated practices under the National Demonstration Program.

4.3.5. Extension orientation

There was only one directly related study showing the relationship of farmers' extension orientation with their adoption behaviour. Hence, previous studies which show the association of farmers' level of adoption with their contact with extension agency are reviewed here.

Findings reported by Singh and Singh (1970), Greywal and Sohal (1971), Karim and Mahboob (1974), Sinha et al. (1974), Vellapandian (1974), Pal et al. (1977), Vijayaraghavan (1977), Palaniswamy (1978), Ravi (1979), Segar (1979) and Thankaraju (1979) indicated that farmers' contact with extension agency had positive and significant influence on their adoption behaviour.

Bhaskaran (1979) reported that extension orientation had positive and significant correlation with adoption behaviour of farmers of less progressive and more progressive villages.

Manivannan (1980) found positive and significant

association between degree of contact with extension agency and extent of adoption of sunflower growers.

Balasubramanian (1980) observed that farmers' contact with extension agency and their adoption behaviour were positively and significantly correlated. Sohi and Kherde's study (1980) also indicated a similar trend between these two variables among small and marginal farmers.

Kamarudeen (1981) reported that farmers' contact with extension agencies showed positive and significant association with their extent of adoption of demonstrated practices.

Haraprasad (1982) indicated that there was positive and significant relationship between contact with extension agency and adoption of improved practices by farmers under the SFDA.

Nanjayan (1985) also explained positive and significant correlation of extension agency contact with extent of adoption of small farmers.

In view of the findings listed above, it would be interesting to gain an insight into the relationship of farmers' adoption of the demonstrated cultivation practices with their extension orientation.

4.3.6. Crop yield index

Channegowda (1971) reported that the adoption level of farmers was positively associated with their per acre yield level of paddy.

Sinha and Kolte (1974) found that higher yield per acre had significant relationship with adoption of improved practices.

Samantha (1977) concluded that crop yield index was significantly associated with farmers' credit repayment behaviour.

Ramalingegowda (1978) indicated that there was significant association between farmers' adoption behaviour and their yield level per acre.

Bhaskaran (1979) found that crop yield index had positive and significant correlation with adoption in the case of farmers of both less progressive and more progressive villages. Sreekumar (1985) reported positive and significant association between average yield and adoption behaviour of both borrowers and non-borrowers of credit.

Based on the above studies, it was postulated that there would be significant relationship between crop yield

index and adoption behaviour of farmers.

4.3.7. Economic Performance Index

Sreekumar (1985) reported that economic performance was positively and significantly correlated with adoption behaviour of borrowers of bank credit, but it was not significantly related with adoption behaviour of non-borrowers.

Based on the above study, it was conceptualized that economic performance and adoption behaviour of farmers would be related. Hence it was decided to test the influence of this variable on the farmers' adoption of the demonstrated practices.

4.3.8. Scientific orientation

Positive and significant relationship between scientific orientation of farmers and their adoption behaviour was established in many of the research studies reported on the subject. They include Sinha et al. (1974), Vijayaraghavan (1977) and Palaniswamy (1978).

Thankaraju (1979) from his study on adoption of sericulture technology by trained and untrained sericulturists concluded that scientific orientation resulted in high adoption in the case of trained sericulturists, while it did not

show any significant influence on the adoption of untrained sericulturists.

Veerasamy and Bahadur (1979) found that those small farmers who had greater orientation towards science were better adopters of improved rice technology.

Manivannan (1980) reported positive and significant correlation of scientific orientation with extent of adoption of sunflower growers. Aristotle (1981) and Kamarudeen (1981) also observed similar association between the two variables.

Philip's (1984) study showed non-significant association between extent of adoption of recommended practices and scientific orientation of farmers.

Positive and significant association was observed between scientific attitude of farmers with their adoption of improved technology for tobacco cultivation by Wilson and Chaturvedi (1985). A similar trend was reported among certified rice seed growers by Jayapalan (1985) and among small farmers by Nanjayan (1985).

All the enlisted studies, except one, have indicated positive and significant influence of scientific orientation

of farmers on their adoption behaviour. Hence, it was decided to study its influence on the adoption of demonstrated practices under the National Demonstration Program.

4.3.9. Management orientation

Shanmukhappa (1978) revealed significant relationship between managerial ability of arecanut growers with their adoption of improved cultivation practices.

Bhaskaran (1979) reported management orientation of farmers of less progressive village as having positive and significant correlation with their extent of adoption. But among the farmers of more progressive village it did not show any significant relationship.

Kamarudeen (1981) found positive and significant relationship between management orientation and adoption of demonstrated practices. Sreekumar (1985) also reported positive and significant relationship between these two variables.

Based on the above findings, it was decided to include management orientation as an independent variable in this study also.

4.3.10. Rationality in decision-making

Deb et al. (1968), from their study, reported that rationality of farmers had significant association with their adoption of improved farm practices.

Supe (1969) observed positive relationship between rationality and adoption of cotton practices by the farmers.

Sawant and Thorat (1977) found that the mean rationality score of the innovators was the highest. But there was no significant statistical difference observed between the adopter categories in respect of their rationality scores.

Singh and Singh (1982) observed that rationality in decision-making with reference to HYV of wheat and family planning program and adoption behaviour of farming couples were positively and significantly related.

Nanjayan (1985) reported that extent of adoption had significant association, but with a negative trend, with rational behaviour.

Based on these studies, it was assumed that adoption of improved practices involves rational thinking and decision making and therefore, rationality in decision making was included as an independent variable in the present study.

4.3.11. Innovation-Proneness

Innovation-proneness was found to be highly associated with adoption of cattle feed mixture in the study by Sinha et al. (1974).

Balasubramanian (1977) also observed positive and highly significant association between innovativeness and adoption of improved practices in ragi.

Similar reports were given by Ravi (1979) among tapioca growing farmers and Sanoria and Sharma (1983) among beneficiaries of Farm Development Programs.

Philip (1984) reported non-significant association between innovation-proneness and extent of adoption of recommended practices by the radio listening farmers.

4.3.12. Communication skill

Only very few studies relating communication behaviour of farmers with their adoption behaviour were found reported.

Sen (1972) found that the communication behaviour of farm leaders was positively associated with their adoption behaviour.

Kalamegam and Menon (1977) reported positive association

between communication behaviour and adoption behaviour.

Bhaskaran (1979) pointed out to the positive and significant correlation between interpersonal communication behaviour efficiency and adoption in the case of farmers of less progressive village while in the more progressive village the correlation was non-significant.

The above findings led to the inclusion of this variable in the study under report.

4.4. Factors affecting effectiveness of National Demonstration in terms of farmers' attitude towards National Demonstration Program

In the absence of direct studies on the subject, a few studies regarding the farmers' attitude towards agricultural development programs are reviewed below.

4.4.1. Age

Prakash (1980) found that age had no significant relationship with attitude of tribal people towards the development programs.

Mani and Knight (1981) reported negative and significant association of age with attitude of both participants and non-participants towards regulated market.

Age was found to have negative relationship with attitude of beneficiaries towards Regional Rural Bank as reported by Ramalingam (1981).

Srinivasan (1981) reported that nearly one half of the marginal farmers and small and big farmers showed most favourable attitude towards dryland technology. It was found that age of marginal farmers had positive and significant association with attitude towards dryland technology.

Sinha et al. (1984) found that there was negative association between age of farmers and their attitude towards soil conservation program, indicating that younger the age, more favourable was the attitude.

Based on the above cited studies, it was decided to find out the influence of age on attitude of farmers towards National Demonstration Program.

4.4.2. Socio-economic status

Prakash (1980) found negative and significant relationship between socio-economic status of tribal farmers and their attitude towards agricultural development programs.

Mani and Knight (1981) reported that socio-economic status had positive and significant association with the

attitude of participants towards regulated market, whereas it had non-significant relationship with the attitude of non-participants.

Sinha et al. (1984) reported that farmers' attitude towards soil conservation program had positive significant association with socio-economic status of farmers.

The above results developed a curiosity to know the influence of the farmers' socio-economic status on their attitude towards National Demonstration Program. Hence it was decided to include it as an independent variable in the present investigation.

4.4.3. Mass media participation

Mani and Knight (1981) showed that mass media exposure maintained positive and significant association with the attitude of participants towards regulated market, while the same had non-significant correlation with the attitude of non-participants.

Since no other related study was available, it was assumed, in the light of the above, that mass media participation has some role to play in influencing the attitude of farmers towards development programs. It would be worth, then, to study its influence on the attitude of farmers

towards National Demonstration Program.

4.4.4. Cosmopoliteness

No study relating cosmopoliteness with attitude of farmers towards transfer of technology programs could be reviewed. However, it was decided to include this variable in this study and establish its association with the farmers' attitude towards National Demonstration Program.

4.4.5. Extension orientation

Srinivasan (1981), in his critical analysis on the adoption of Dryland Technology, reported that extension agency contact of small farmers showed positive and significant relation with their attitude towards the program.

Sinha et al. (1984) reported that attitude of farmers towards soil conservation program had positive and significant association with extension contact.

Based on the above findings, it was decided to test the influence of extension orientation on farmers' attitude towards National Demonstration Program.

4.4.6. Crop yield index

In this regard also there was no closely related

study reported. Hence it was though worth to study its influence on the attitude of farmers towards National Demonstration Program.

4.4.7. Economic performance index

Sreekumar (1985) found positive and significant correlation between economic performance and attitude of farmers towards bank credit.

There was no other study available reporting the influence of this variable on farmers' attitude towards development programs. Hence, based on the above study, it was decided to test its effect on the dependent variable.

4.4.8. Scientific orientation

Sinha et al. (1984) reported non-significant association of attitude of farmers towards soil conservation program with their scientific orientation.

To find its association with farmers' attitude towards National Demonstration Scheme, scientific orientation was also included in this study as an independent variable.

4.4.9. Management orientation

Management orientation was found to have positive

and significant association with farmers' attitude towards bank credit in the study by Sreekumar (1985). In the absence of any other related reports, it was assumed that management orientation would influence the attitude of farmers towards National Demonstration Program and therefore, it was decided to include this as an independent variable in the study under report.

4.4.10. Rationality in decision-making

No study indicating the relationship of this variable with attitude of farmers towards any development program was available. Hence, it was decided to test if it has some influence on the dependent variable.

4.4.11. Innovation-proneness

In this context also, no study could be reviewed. However, it was decided to include the variable in this study to test and establish its association with the dependent variable.

4.4.12. Communication skill

In the absence of closely related studies, it was decided to study its influence on the attitude of farmers towards the program.

5. Perception of farmers about the methodology followed in the conduct of National Demonstrations

Farmers, both beneficiaries and non-beneficiaries perceive the impact and methodology of conduct of the various agricultural development programs variously. A few studies available in this regard 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 demonstration 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. Only less than one-half of the gramasevaks organised field days. 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. Recommended inputs were

supplied in time in most of the plots.

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 program was undertaken.

A critical analysis of the functioning of SFDA in Maharashtra by Salunkhe (1977) showed that the supplies arranged by SFDA were late, but the method of giving benefits was simple and distributing subsidy was comparatively easy.

Bhilegaonkar and Dakh (1978) reported that 54.17 percent of the farmers perceived high utility of the mobile farm advisory service.

Balu (1980) observed that majority of the beneficiaries of Integrated Dryland Agricultural Development Project expressed that the arrangement of supplies and services was most adequate and most timely.

Nandakumar (1980) reported that majority of the participants were satisfied about the working conditions of Drought Prone Area Program. Only a meagre percentage

had neutral idea and none expressed dissatisfaction.

A beneficiary analysis of the IRDP by Duraiswami (1981) indicated that majority of the farmers felt the subsidy given as 'very high' and 'consoling'. According to the small and marginal farmers, the supply received was 'adequate'. The agricultural labourers perceived it as 'very adequate'. Majority of the small farmers, marginal farmers and agricultural labourers expressed that inputs were supplied at appropriate time and the services given were correct and appropriate.

An overall favourable perception was held by the farmers about the research station and research workers, as observed by Sivakumar (1983).

Perception of farmers about the methodology followed while conducting any agricultural development program is a sure indicator of its effectiveness and, therefore, it was decided to study the perception of farming about the methodology followed in the conduct of the National Demonstrations.

6. Constraints experienced by farmer-demonstrators in conducting National Demonstrations

In the absence of direct studies on this aspect,

a few closely related studies are reviewed here.

Rajendran (1978) reported that the high cost involved in adoption of a particular practice, non-availability of supplies and services at proper time and in adequate quantities, lack of awareness and lack of adequate skill in using the technique were the major constraints on adoption by small farmers.

Palaniswamy (1978) identified scarcity of labour, inadequate irrigation and price fluctuation as the problems faced by the Malli and Mullai flower growers.

Pathak et al. (1979) listed the problems reported by the demonstration and non-demonstration farmers which include (1) lack of timely supply of inputs (2) lack of irrigation facilities (3) lack of working skill in the farmers (4) lack of animal power (5) lack of technical assistance (6) lack of credit facilities (7) low purchasing power (8) unavailability of spare-parts of implements, and (9) unstable prices of inputs and produces.

Lingan (1981) identified high cost of fertilizers, non-availability of fertilizers and non-availability of financial help as the major constraints in adoption by fer growers.

The major constraints in adoption of summer cropping identified by Thiagarajan (1981) were high labour cost and high cost of inputs.

Ponnappan (1982) identified that the constraints encountered by fish farmers were low price of produce, insufficient credit facilities and inadequate guidance by field staff.

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

The constraints on farmers' adoption of dryland technology listed by Bhoite and Nikalji (1983) were inadequacy of capital, lack of knowledge, non-availability of seeds, fertilizers, pesticides, improved implements and inadequacy of labour and technical guidance.

High labour consumption required for following the recommended improved practices and lack of supply of sufficient good quality seedlings were the major constraints felt by the beneficiaries of the SADU, as reported by Vijayakumar (1983).

Kulkarni and Sangle (1984) found that incompatibility of recommended technology, insufficient supplies of inputs and credits, non-availability of services and supplies and lack of knowledge about the technology were the important constraints responsible for technological gap.

Jayapalan (1985) identified scarcity of labour for field operations, lack of power supply for agricultural purpose etc. as the constraints on certified rice seed production.

The above studies indicate that the farmers have to encounter an array of problems while practising improved agriculture. Identifying the constraints involved in conducting the demonstrations experienced by the farmer-demonstrators of the National Demonstration Program was, therefore, included as an objective of this study.

7. Theoretical concepts and Operational Definitions of the selected variables

7.1. Effectiveness of National Demonstration

Rao (1971) measured the impact of National Demonstration in terms of farmers' perception about the purpose of demonstration and extent of adoption of the demonstrated cultivation practices. Jha and Sharma (1972) measured the

impact in terms of awareness about demonstration, extent of utilization of demonstration as a source of information, gain in knowledge, opinion about the demonstration and extent of adoption of the high yielding varieties and the package of practices. Singh and Singh (1974) and Pathak et al. (1979) studied the impact in terms of knowledge, attitude and adoption levels of farmers in relation to the demonstrated cultivation practices.

Ravikumar (1978), Hirevenkanagoudar et al. (1984) and Nikam and Singh (1984) studied the impact of National Demonstration in terms of gain in knowledge and adoption of farmers. Kibey et al. (1984) studied the impact in terms of farmers' adoption of the improved agricultural technology, and Gaurha and Pathak (1985) in terms of increase in yield.

Effectiveness of National Demonstrations in this study has been measured in terms of the farmers' level of knowledge about, attitude towards and adoption of the selected demonstrated cultivation practices of paddy and attitude of the farmers towards the National Demonstration Program.

7.2. Farmer-Demonstrator

In this study, a farmer-demonstrator is a paddy cultivator in Quilon district, in whose field the National Demonstration was laid out by the KAU.

7.3. Neighbouring Farmer

A neighbouring farmer is one who is a paddy grower of the same padasekharam in which the National Demonstration was laid out.

7.4. Knowledge

English and English (1958) defined knowledge as a body of understood information possessed by an individual or by a culture.

Operationally, knowledge is defined as the body of information possessed by an individual with respect to the selected cultivation practices of paddy demonstrated under the National Demonstration Program.

7.5. Attitude towards the demonstrated practices

Allport (1935) defined attitude as a mental and neural state of readiness organised through experience, exerting the directive or dynamic influence upon the individual's response to all objects and situations with which it is related.

Thurstone (1946) defined attitude as the degree of positive or negative affect associated with some psychological

object towards which people can differ in varying degrees.

According to Krech and Crutchfield (1948), attitude is an enduring organisation of motivational, emotional, perceptual and cognitive processes with respect to some objects of an individual's world.

For the present study, attitude refers to the degree of favourable or unfavourable disposition as expressed by the respondents towards the selected cultivation practices of paddy demonstrated under the National Demonstration Program.

7.6. Adoption

Wilkening (1952) postulated adoption of an innovation as a process composed of learning, deciding and action over a period of time.

According to Ramsey et al. (1959), adoption behaviour involved two components (1) behavioural, which involves the actual use of the practice (ii) cognitive, which includes obtaining knowledge and critical evaluation of the practices in terms of individual situations.

Rogers (1962) defined adoption process as the mental process through which an individual passes from first hearing about an innovation to its final adoption.

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

Rogers and Shoemaker (1971) defined adoption as a decision to continue full use of an innovation as the best course of action.

For this study, the term adoption has been defined as the observable action in the form of practise of selected cultivation practices of paddy demonstrated under the National Demonstration Program.

7.7. Attitude towards National Demonstration Program

It is operationally defined as the degree of favourable or unfavourable disposition as expressed by the respondents towards the National Demonstration Program as such.

7.8. Perception

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, interests, experience etc.

Operationally, perception is defined as the interpretation made by the respondents about the methodology followed in the conduct of the National Demonstrations.

7.9. Age

Age is defined as the number of years the respondent has completed at the time of the study since his birth.

7.10. 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 possession 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 possession.

For the present study, socio-economic status is taken as a multidimensional concept referring to the respondents'

occupation, education, family type and size, income, social participation, land owned, home, farm power and material possession.

7.11. Mass media participation

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

Mass media participation is operationally defined as the number of mass media information sources used or contacted by the respondents.

7.12. Cosmopoliteness

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

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

7.13. Extension orientation

Extension orientation is a cumulative function of

extension contact and extension participation. It has been operationally defined as the respondents' frequency of visiting the extension personnel like Agricultural Demonstrators, Village Extension Officers, Junior Agricultural Officers, Block Development Officers, University Scientists and others in connection with agricultural activities and the respondents' extent of participation in agricultural extension activities conducted in the village.

7.14. 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.

7.15. Economic performance index

Economic performance index is the ratio of the value of total output to total expenditure incurred on the major crop enterprises.

7.16. 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.

7.17. Management orientation

Following Samantha (1967), 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.

7.18. Rationality in decision making

Rationality denotes a style or behaviour that is appropriate to the achievement of given goals within the limits imposed by given conditions and constraints (Gould and Kolb, 1964).

Rationality in decision making has been operationally defined as the ability of an individual to select those 'means' which are justified of bearing rationality, from the various 'means' available at his disposal to reach an 'end'.

7.19. Innovation-proneness

Rogers (1960) defined innovativeness as the degree to which an individual is earlier than others in his social system to adopt new ideas.

[redacted] innovativeness as the degree of an individual's interest and desire to seek changes in farming techniques and to introduce such changes into his own operation as and when found practicable and feasible.

Moulik's definition was taken as the operational definition in this study.

7.20. Communication skill

Communication skill was defined as the ability of the farmer-demonstrator in receiving and transmitting messages.

8. Hypotheses

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

H_o-1 There would be no significant difference between the farmer-demonstrators and neighbouring farmers with respect to their knowledge on the demonstrated cultivation practices of paddy.

H_o-2 There would be no significant difference between the farmer-demonstrators and the neighbouring farmers with respect to their attitude towards the demonstrated cultivation practices of paddy.

H_o-3 There would be no significant difference between the farmer-demonstrators and neighbouring farmers in their level of adoption of the demonstrated practices.

H_o-4 There would be no significant difference in the attitude of the farmer-demonstrators and neighbouring farmers towards the National Demonstrations.

H_o-5 There would be no significant contribution of the set of selected independent variables in the variations in the knowledge of the farmers about the demonstrated cultivation practices of paddy.

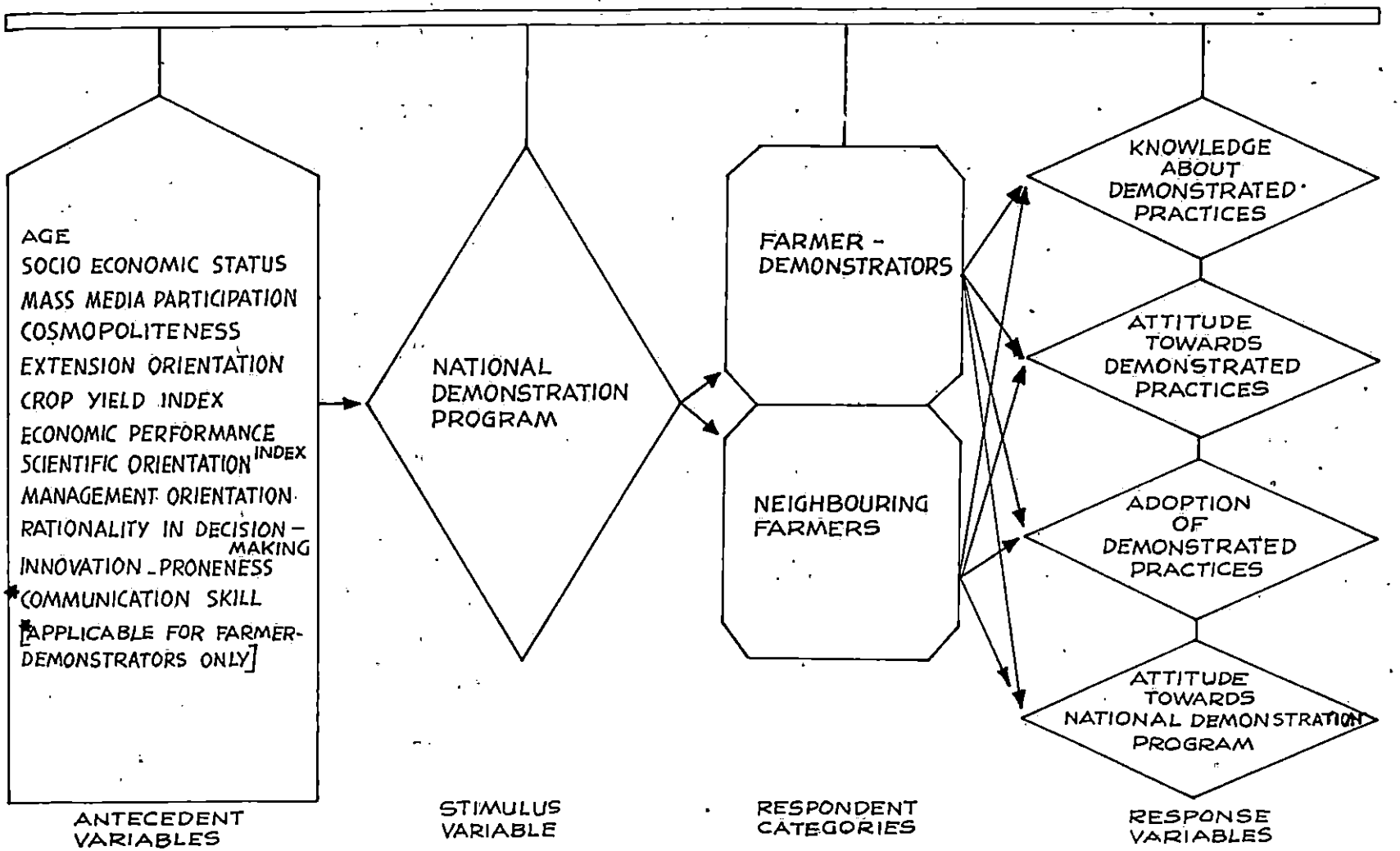
H_o-6 There would be no significant contribution of the set of selected independent variables in the variations in the attitude of the farmers towards the demonstrated cultivation practices of paddy.

H_o-7 There would be no significant contribution of the set of selected independent variables in the variations in the level of adoption of the demonstrated cultivation practices of paddy by the farmers.

H_o-8 There would be no significant contribution of the set of selected independent variables in the variations in the attitude of the farmers towards the National Demonstrations.

H_o-9 There would be no significant difference in the perception of the farmer-demonstrators and the neighbouring farmers about the methodology followed in conducting National Demonstrations.

FIG. 1 - CONCEPTUAL FRAME WORK OF THE STUDY



METHODOLOGY

III. METHODOLOGY

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

I Location of the study

II Selection of the sample

III Selection of demonstrated cultivation practices

IV Variables selected and their quantification

V Techniques employed in data collection

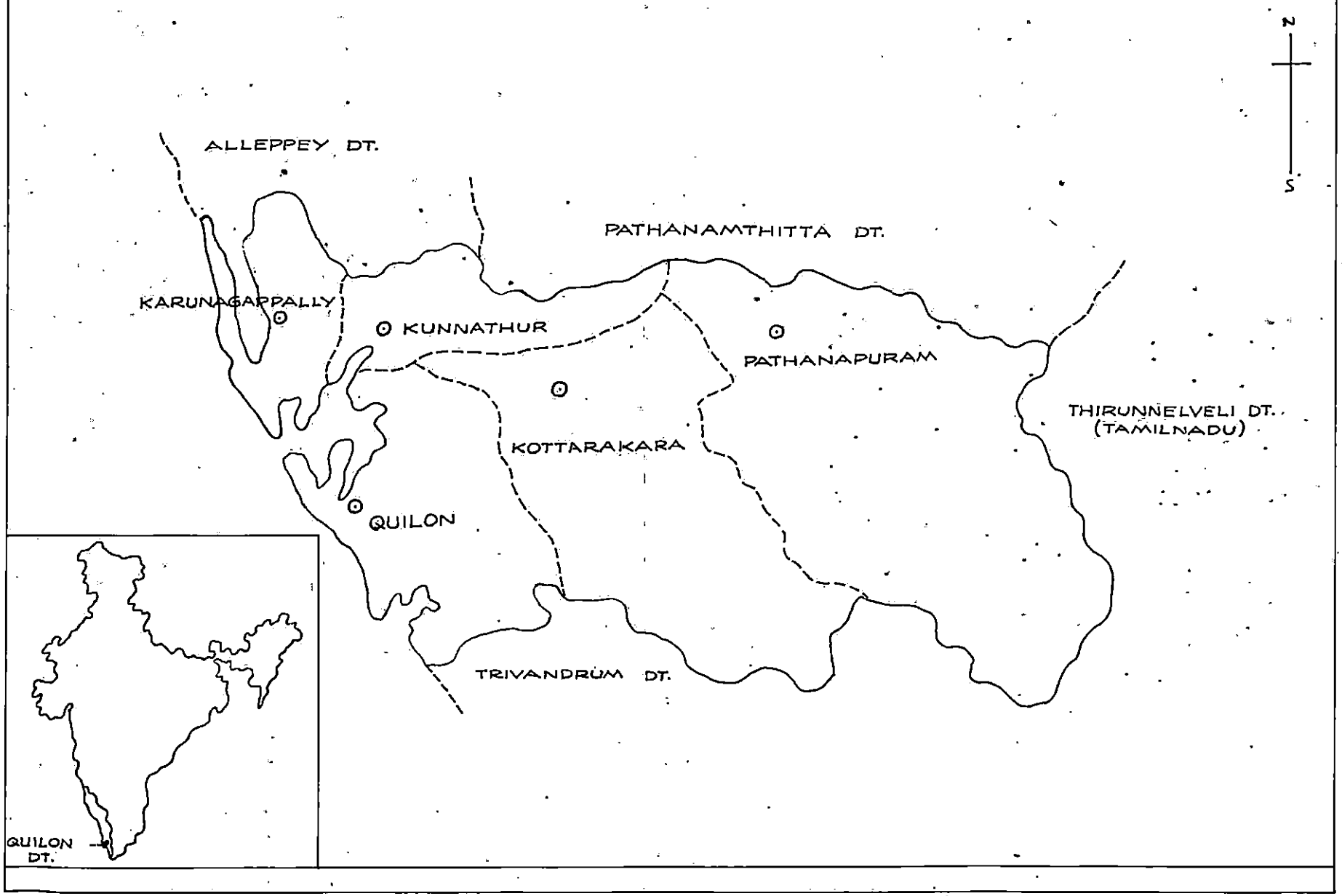
VI Statistical methods used

I. Location of the study

The study was conducted during August-September, 1986 in Quilon district of Kerala State, where the National Demonstration Program is being implemented by the KAU. Quilon is the only district with on-going program of National Demonstration in the State and hence it was selected for the study, purposively.

Since its implementation, 109 demonstrations were conducted in Quilon district - 25 demonstrations in 1983-'84, 20 in 1984-'85, 25 in 1985-'86 and 39 in 1986-'87. Of this, 63 demonstrations were on improved practices of paddy cultivation.

FIG. 2 MAP SHOWING THE LOCATION OF THE STUDY



The padasekharams*, where demonstrations were conducted during 1983-'84 and 1984-'85 were selected for the pilot study. The padasekharams, wherein National Demonstrations were conducted during 1985-'86 and 1986-'87 formed the location of the final study. During 1985-'87, 46 demonstrations were conducted on paddy cultivation. These demonstrations were conducted at different locations in fourteen villages namely Kulasekharapuram, Punalur, Puthur, Kulathupuzha, Pathady, Pattazhy, Panthaplavu, Pandithitta, Thalavur, Kummil, Kadackal, Karinganoor, Velinalloor and Chenkulam. A map showing the location of the study is furnished as Fig.2.

II. Selection of sample

Improved cultivation practices on crops such as paddy, tapioca, sesamum, cowpea and groundnut were demonstrated under the National Demonstration Program in Quilon district. Since the demonstrations conducted for the other crops were very few in number and since paddy is the predominant food crop of the State, demonstrations conducted on paddy alone were selected for the study.

- -

*A contiguous and agroclimatically uniform area where paddy is the predominant crop.

The sample comprised of all the 46 farmer-demonstrators in whose fields the National Demonstrations were laid out and 100 neighbouring farmers cultivating paddy. These 100 farmers were selected randomly from among the farm families neighbouring to the demonstration plots. Thus, a total number of 146 farmers formed the sample for the study.

The recency of demonstration of the practices followed by the farmer-demonstrators and the simultaneous exposure of the same to the neighbouring farmers were the criteria for fixing up the particular years viz. 1985-'86 and 1986-'87 for the study.

III. Selection of demonstrated cultivation practices

Many agronomic and plant protection practices with production potentialities were demonstrated in the farmers' fields under the National Demonstration Program. Of them, five practices were selected for the study in accordance with their popularity as common practices amongst the farmers as well as on the basis of the opinion of the Project Leader and Subject Matter Specialists implementing the Program. These practices were:

1. Use of high yielding varieties
2. Soil testing

3. Liming
4. Use of chemical fertilizers
5. Use of plant protection chemicals

IV. 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.

A. Dependent variables

1. Knowledge on the five demonstrated cultivation practices of paddy.
2. Attitude towards the five demonstrated cultivation practices of paddy.
3. Adoption of the five demonstrated cultivation practices of paddy.
4. Attitude towards the National Demonstration Program.

B. Independent variables

1. Age
2. Socio-economic status
3. Mass media participation
4. Cosmopoliteness
5. Extension orientation
6. Crop yield index

7. Economic performance index
8. Scientific orientation
9. Management orientation
10. Rationality in decision-making
11. Innovation-proneness
12. Communication skill

C. Perception of the farmers about the methodology followed in the conduct of National Demonstrations

D. Constraints experienced by the farmer demonstrators in conducting National Demonstrations

The above variables were quantified by the following procedures.

A. Dependent variables

1. Knowledge on the demonstrated cultivation practices

Cronbach (1949) defined knowledge test as one in which procedures, apparatus and scoring have been fixed so that precisely the same test can be given at different times and places.

A standardised knowledge test defined by Noll (1957) is one that has been carefully constructed by experts in the light of acceptable objectives or purposes and procedures

for administering, scoring and interpreting scores are specified in detail so that the results should be comparable and norms and averages for different age and status have been predetermined.

Shankariah and Singh (1967) measured knowledge of respondents on improved methods of vegetable cultivation using the teacher-made-test as suggested by Anasthasi (1961).

Nair (1969) measured knowledge level of farmers on recommended package of practices of rice using teacher-made-test with multiple choice questions. This method was followed by Kamarudeen (1981).

Jaiswal and Dave (1972) computed the knowledge score as follows:

$$\text{Knowledge score} = \frac{\text{Number of correct answers}}{\text{Total raw scores}} \times 100$$

Singh and Singh (1974) developed a knowledge test based on the response of farmers on various aspects of wheat cultivation. The total score of each individual was calculated by the formula,

$$\frac{X_1}{N} \times 100 \quad \text{where,}$$

X_1 = Number of correct answers

N = Total number of questions

In this study, the scale used by Kamarudeen (1981) based on the method developed by Nair (1969) was made use of with slight modifications to measure the farmers' knowledge on the demonstrated cultivation practices. Only five practices were selected and, questions were changed to suit the location under study.

Method of scoring

18 items were included in the knowledge test. Each respondent was given one score for correct answer and zero score for incorrect answer. The total knowledge score for each respondent was calculated by summing up the scores given for each item. Thus, the maximum knowledge score that could be obtained by a respondent was 18 and the minimum that could be obtained was zero.

The knowledge scores of all the farmer-demonstrators and the neighbouring farmers were added together separately and mean scores were worked out for comparison.

2. Attitude towards the demonstrated cultivation practices of paddy

Attitude was measured by an attitude scale. An attitude scale is one which assesses the degree of affect that individuals may associate with some psychological object.

Kamarudeen (1981) measured the attitude of farmers towards the demonstrated cultivation practices of paddy by using a scale developed for the purpose using Likert's (1932) method of summated rating. His scale was made use of in this study with slight modifications by deleting the sub-scale for seed treatment. The scale consisted of five sub-scales, each having six statements.

Thus the final scale consisted of 30 statements. The responses were collected on a five-point continuum as follows:

SA - Strongly agree
A - Agree
UD - Undecided
DA - Disagree
SDA - Strongly disagree

The various responses were assigned numerical weights of five for strongly agree, four for agree, three for undecided, two for disagree and one for strongly disagree, in the case of positive statements. The scoring procedure was reversed for negative statements.

The total attitude score for each respondent was calculated by adding up the scores on each sub-scale. Thus, the maximum score that could be obtained by an individual on a sub-scale was 30 and the minimum that could be obtained

was six. Similarly, in the whole scale the maximum score that could be obtained was 150 and the minimum 30. After computing the attitude scores, the mean score for each category of the respondents was worked out.

3. Adoption of the demonstrated practices

Many research workers have developed various methods to measure the adoption behaviour.

Wilkening (1952) used an index for measuring the adoption of improved farm practices. The index of adoption used was the percentage of practices adopted to the total number of practices applicable for that farmer.

Duncan and Kreetlow (1954) used a 25-item index of farm practices adoption which was a modification of the index developed by Wilkening.

Marsh and Coleman (1955) used "practice adoption" scores computed as the percentage of applicable practices adopted.

Fliegel (1956) constructed an index of adoption of farm practices using the correlation of several adoption variables. He used factor analysis of each of the 11 factors selected. A score of one was given for adoption and zero for non-adoption.

Beal and Rogers (1960) studied in detail the adoption of two farm practices. A simple adoption scale was developed which credited individual with one point for adoption and zero point for non-adoption of a practice.

Chattopadhyay (1963) used adoption quotient for measuring adoption behaviour. This is a ratio scale that measures a farmer's behaviour on dimensions of applicability, potentiality, extent, time, consistency and differential nature of innovations.

Supe (1969) developed a scale viz. cotton practices adoption scale. He selected ten practices of cotton and for each practice, the total score for complete adoption was six. The practices which were divisible were assigned partial scores for partial adoption.

Singh and Singh (1974) also used an 'adoption quotient' which was a modification of the one developed by Chattopadhyay (1963). According to this, the adoption quotient of each respondent was calculated by using the following formula.

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

where,

Σ = the summation

e = extent of adoption of each practice

p = potentiality of adoption of each practice

N = total number of practices selected

In the present study, the method developed by Supe (1969) and used with slight modifications by Kamarudeen (1981) was followed for measuring the level of adoption of selected demonstrated cultivation practices. According to this method, score of three was given for full adoption, two for incomplete or improper adoption and one for non-adoption.

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

1. Use of high yielding varieties

(1) Demonstrated variety - Score - 3
(2) Any other high yielding variety - Score - 2
(3) Local variety - Score - 1

2. Soil testing

(1) Proper soil testing - Score - 3
(2) Incomplete/improper - Score - 2
(3) No soil testing - Score - 1

3. Liming

(1) Proper liming - Score - 3
(2) Incomplete/Improper liming - Score - 2
(3) No liming - Score - 1

4. 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 (not on the basis of soil test results) - Score - 2

(3) No chemical fertilizer application - Score - 1

5. 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 five demonstrated practices, the mean score for the farmer-demonstrators and the neighbouring

farmers were calculated separately.

4. Attitude towards National Demonstration Program

Attitude of farmers towards National Demonstration Program was measured by means of an attitude scale constructed for the purpose in the study.

Statements regarding different aspects of National Demonstration were collected on the basis of review of literature, discussion with farmers in the demonstration area and consultation with experts who are directly involved in the program. These statements were written carefully to include the universe of contents about the psychological object. In this way, 40 statements were selected after editing, to meet the criteria for selection of attitude statements enunciated by Edwards (1957).

The method of equal appearing intervals, described by Thurstone and Chave (1929) was used to determine the scale values of the 40 statements. For this, the edited statements were presented to a group of 40 judges who were asked to indicate their perception of the degree of favourableness or unfavourableness expressed by each of the statements towards National Demonstrations. The judges were requested to rate each statement on a nine-point continuum

as follows:

Statements that seem to express the most unfavourable feelings about National Demonstrations are to be placed in the first continuum. Those statements that seem to express the most favourable feelings about National Demonstrations are to be placed in column nine. The neutral column (5) is where statements which express neither favourable nor unfavourable feelings about the psychological object are to be placed. Varying degrees of increasing favourableness are expressed by columns six to nine and varying degrees of increasing unfavourableness by four to one.

The judges were reiterated that the researcher was interested to study not their own attitude towards National Demonstrations but their perception of the degree of favourableness/unfavourableness expressed by each of the statements.

Tabulation was done indicating the number of judges who placed each item in each continuum. From these data, proportion of responses and their cumulative proportions were computed. The median of the distribution of judgements for each statement was taken as its scale value, which was found by means of the following formula:

$$S = 1 + \frac{(0.50 - \Sigma pb)i}{pw}$$

where,

S = the median or scale value of the statement

l = the lower limit of the interval in which the median falls

Σpb = the sum of the proportions below the interval in which the median falls.

pw = the proportion within the interval in which the median falls

i = the width of the interval and is assumed to be equal to 1.0

The variation of the distribution of judgements for a given statement was measured by the interquartile range (Q) used by Thurstone and Chave (1929). The 'Q' value which contains the middle 50 percent of the judgements was determined by measuring the 75th centile and 25th centile. The 25th and 75th centiles were obtained from the formulae;

<u>The 25th centile</u>:

$$C_{25} = l + \frac{(0.25 - \Sigma pb)i}{pw}$$

where

C_{25} = the 25th centile

l = the lower limit of the interval in which the 25th centile falls

Σpb = the sum of the proportions below the interval in which the 25th centile falls

pw = the proportion within the interval in which the 25th centile falls

i = the width of the interval and is assumed to be equal to 1.0.

The 75th centile:

$$C_{75} = l + \frac{(0.75 - \Sigma pb)i}{pw}$$

where

l = the lower limit of the interval in which the 75th centile falls

Σpb = the sum of the proportions below the interval in which the 75th centile falls

pw = the proportion within the interval in which the 75th centile falls

i = the width of the interval and is assumed to be equal to 1.0

Then the interquartile range or Q was measured as the difference between C_{75} and C_{25}.

$$Q = C_{75} - C_{25}$$

A large Q value was an indication of ambiguity of the statement while, a small Q value indicated that there was good agreement among the judges in their judgement of the degree of favourableness or unfavourableness of the statement. Thus 12 statements with high 'S' values and

low 'Q' values were selected and included in the attitude scale. These 12 statements were proportionately distributed among the nine categories in the continuum. Six statements were positive and six were negative. The statements with their scale values and Q values are furnished in Appendix I.

Reliability of the scale

Reliability is the accuracy or precision of a measuring instrument. A scale is reliable only when it will consistently produce the same result when applied to the same sample. Guilford (1954) defined reliability as 'the proportion of variance in obtained test scores'. In this study, the reliability of the scale was found by the split-half method as suggested by Guilford (1954).

Split-half method

The scale was administered to 30 respondents in the villages where National Demonstrations were conducted in 1983-'84 and 1984-'85. The responses for each statement were obtained on a five-point continuum viz. five, four, three, two and one indicating strongly agree, agree, undecided, disagree and strongly disagree respectively for positive statements and in the reverse order for negative statements. For each respondent, the scores were added up

separately for the even and odd numbered statements. Correlation coefficient between the two sets of scores was calculated. From this the reliability value was calculated using the Spearman-Brown formula,

$$R = \frac{nr}{1 + (n-1)\, r}$$

where,

r = Correlation Coefficient

n = No. of parts into which the scale was divided = 2

The reliability coefficient of the test was 0.800, which was significant at 1 percent level of probability, indicating that the scale was reliable.

Validity of the scale

The validity of a scale means the fidelity with which it measures what it purports to measure. The scale developed was tested for the following two types of validity

a) Content validity

The main criterion for content validity is how well the contents of the scale represent the subject matter under study. The present scale had this validity since all the possible items in the universe of contents had been included

b) Construct validity

This was tested by calculating the correlation coefficient between extension orientation and attitude scores of 30 respondents. The correlation coefficient was 0.833, which was significant at 1 percent level of probability. Hence it was concluded that the scale had construct validity also.

Administration of the scale

The attitude scale constructed as described above, was administered to the 146 respondents during the interviews. Responses were collected in a five-point continuum with scores of five (strongly agree), four (agree), three (undecided), two (disagree) and one (strongly disagree) for positive statements and in the reverse order for negative statements. The total score was obtained for each respondent and mean scores were calculated for the farmer-demonstrators and neighbouring farmers separately.

B. Independent variables

1. Age

Age was measured as the number of years the respondent has completed at the time of the investigation since his birth.

2. Socio-economic status

The socio-economic status scale developed by Bawajir and Nandapurkar (1985) was modified and used for the present study to suit the conditions prevailing in the study area.

The items coming under the scale are occupation, education, family, income, social participation, land, home, material possession and animal possession.

Assignment of scores for the various items was as follows:

1. Occupation	Score
Labourer	1
Caste occupation	2
Business	3
Cultivation	4
Services	5

2. Education

A. Husband's education	Scores
Illiterate	1
Can read only	2
Can read and write	3
Primary	4

Middle	5
High School	6
Graduate	7

B. Wife's education	Scores
Illiterate	1
Can read only	2
Can read and write	3
Primary	4
Middle	5
High School	6
Graduate	7

3. Family		Scores
(a) Type:	Single	1
	Joint	2
(b) Size:	Below 5	1
	5 and above	2

4. Income	Score
Rs.1200 - Rs.1800	1
Rs.1801 - Rs.2400	2
Rs.2401 - Rs.3500	3
Rs.3501 - Rs.4800	4
Rs.4801 and above	5

5. Social participation	Score
Member of one organization	1
Member of more than one organization	2
Office bearer	3
Wider public leader	4

6. Land	Score
1 acre	1
1.1 - 5 acres	2
5.1 - 10 acres	3
10.1 - 15 acres	4
15.1 - 20 acres	5
20.1 and above	6

7. Home	Score
A. Thatched	1
Tiled	2
Concrete	3

B. Lighting facilities	Score
Kerosine lamp	1
Electricity	4

C. Ownership of house	Score
Rented house	1
Own house	2

8. Material possession	Score
(a) Mould board plough	5
Reaper	2
Sprayer	2
Duster	1
Storage Iron bin	1
(b) Vehicles	
Cycle	1
Motor cycle	3
Tractor	4
Electric motor	1
(c) Sources of Information	
Radio	3
Newspaper	1
Farm magazine	2
Agricultural publications	4

9. Animal possession		Score
Bullocks	1 pair	1
	2 pairs	2
	3 pairs	3
Cow		4
Poultry		1

3. Mass media participation

In order to know the extent of participation of the respondents in mass media, different mass media sources were listed and the respondents were asked to indicate as to how often they used each of these. The sources are given below.

1. Newspaper
2. Radio (general)
3. Radio (rural programs)
4. Magazines and other publications on agriculture

The weightage for each item with reference to frequency is given below.

Frequency	Scores
Two or more times a week	4
Once a week	3
Once a fortnight	2
Once a month	1
Never	0

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

4. Cosmopoliteness

The extent of cosmopoliteness of the farmers was

assessed taking into consideration the frequency of visits to nearest town, purpose of visit and membership in organizations outside the village.

a. Frequency of visit to the nearest town

Frequency	Scores
Two or more times a week	4
Once a week	3
Once a fortnight	2
Once a month	1
Never	0

b. Purpose of visit

Agricultural	3
Personal	2
Entertainment	1
Others	0

c. Membership in organisations outside the village

Member	1
Non-member	0

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

5. Extension orientation

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

a. Extension contact

b. Extension participation

a. 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 demonstrator/ Agricultural Officer/ Block Development Officer	Score
Two or more times a week	3
Once a week	2
Once to thrice a month	1
Never	0

B. 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 respondents' 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 are conducted	1
Never	0

The scores obtained for both the sub-iten of the respondents were calculated and this gave t sion orientation scores.

6. Crop yield index

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

For calculating the crop yield index of a particular farmer, the average yield of the common crops such as paddy, coconut, banana and tapioca in the village was first determined. By dividing the yield per unit area of each crop on the particular farm by the average yield of the crop in the village, and multiplying by 100, a percentage figure 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 and tapioca, in the year preceding the year of study ie. 1984-'85 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. Economic performance Index

The procedure adopted by Shankaraiah and Crouch (1977) which was slightly modified and used by Sreekumar (1985) was used to quantify this variable. The Economic Performance Index (EPI) of a respondent was measured by working out the

ratio of the value of total output to total expenditure incurred. Only one component, namely, crop enterprise was considered in computing the total output and expenditure. The total value of output and total expenditure incurred were calculated for the commonly cultivated crops of the area viz., Paddy, Coconut, Banana and Tapioca. The formula used to work out EPI was

$$EPI = \frac{K_i \; P_i \; Q_i}{K_i \; C_i}$$

where,

P_i is the price per unit of the product of the i^{th} enterprise

Q_i is the quantity of the i^{th} enterprise

C_i is the total expenses incurred in the i^{th} enterprise

and K refers to crop enterprise

The area under cultivation of each crop and the per acre yield of the crop for a particular farm were recorded first. The total production of the crop was then calculated. The value for produce from each crop and the cost of production for these crops were obtained. The ratio of the value for the produce to the cost of production for each crop multiplied by 100 gave the EPI for that particular crop.

The EPI for all the four crops were summed up and divided by the number of crops included. This value was taken as the Economic Performance Index for an individual respondent.

8. Scientific orientation

The scientific orientation scale developed by Supe (1969) was used for this study to know the respondents' 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	7
Agree	5
Undecided	4
Disagree	3
Strongly disagree	1

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

9. 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.

10. Rationality in decision-making

The rational decision-making ability of a farmer was measured with the help of a Rationality Quotient (R.Q.) using the formula given by Supe (1969). R.Q. was computed using the formula

$$R.Q. = \sum_{i=1}^{N} \frac{e_i}{p_i} \times w_i$$

where,

N = Number of decision which are applicable to the situation of the farmer.

$\sum_{i=1}^{N}$ = Summation over each of the N decisions of which any one is the i^{th} decision

e_i = Extent of rationality of i^{th} decision which can be less rational (1), moderately rational (2) and highly rational (3)

p_i = Potentiality for being rational in i^{th} decision (considered as 3 in all the decisions for the present study)

w_i = Weight to be given to i^{th} decision based on the differential complexity weights for decisions (considered as 1 for all decisions for the present study)

The items developed by Supe (1969) and modified by Prasad (1983) to suit the nature of the crop was used for measuring this variable. Five items (decisions) were selected and six reasons for arriving at each decision were given. The score given for each reason was as follows.

A. Decision on the area to be put under paddy last year.

	Score
1. Ease of cultivation	1
2. Availability of water/labour/ credit	2
3. Market conditions	3
4. Always sows the same area	2
5. Requirement of rice for the family	3
6. Do not know	1

B. Decision on sowing only the specific variety and not others.

1. Recommendation of Extension personnel	3
2. Recommendation of Fellow farmers	2

3. Used same seed last year	2
4. Meets the specific needs (disease resistant, salt tolerant etc.)	3
5. Used seeds which are available	1
6. Do not know	1

C. Decision on the method of sowing (transplanting/broadcasting)

1. Special qualities of the method	3
2. Recommendation of other farmers	2
3. General experience gained	2
4. Recommendation of extension personnel	3
5. Followed the same practice last year	1
6. Do not know	1

D. Decision on the quantity of fertilizer used last year

1. General experience gained	2
2. Used what I had at hand	1
3. Soil test results	3
4. Recommendation of other farmers/ neighbours/dealers	2
5. Recommendation of extension personnel	3
6. Do not know	1

E. Decision on the various measures of plant protection

1. Recommendation of extension personnel	3
2. Nature of damage	3
3. Used the chemical which was available	1
4. General experience and knowledge	2
5. Recommendation of neighbours/other farmers/dealers	2
6. Do not know	1

The respondents were asked to indicate any one of the six reasons under each decision which was most appropriate in their case. The total score for each respondent was measured and taken as the score for rationality in decision-making. The maximum score that could be obtained by an individual was 15 and the minimum, five.

11. Innovation-proneness

Shailaja (1981) measured innovativeness with respect to adoption of high yielding varieties. She used a set of five statements on a three-point continuum as always, sometimes and never to which the scores assigned were 2, 1 and 0 respectively.

Moulik (1965) developed a self-rating scale to measure the innovation-proneness of farmers. The scale consisted of

three sets of statements, each set containing three separate statements with weights 3, 2 and 1, indicating high, medium and low degree of innovation-proneness respectively. After obtaining the most to least choices for each of the three sets of statements, the scoring was done by summing up the ratios of the weight of the 'most like' statements to the weights of the 'least like' statements.

The self rating scale developed by Moulik (1965) was used to measure innovation-proneness of the respondent-farmers.

12. Communication skill

Parshad and Sandhu (1974) measured the communication skill of village level workers by using rating scale comprising of (i) self assessed ability to communicate, (ii) self assessed level of communication qualities, (iii) training received by village level workers for conducting various activities and (iv) ability to treat message about selected innovations.

Sinha (1976) measured the communication skill by asking the respondents to indicate whether they possess adequate skills to elicit favourable responses from the people.

Reddy (1976) measured communication skill of village level workers from their ability to communicate and their communication qualities.

The scale developed by Pareek and Singh (1966) was used to measure the communication skill of the farmer-demonstrators in the present study. The scale consisted of seven statements. The respondents were asked to indicate their skill regarding the seven statements on the basis of the frequency of occurrence of that behaviour. The possible response patterns were always, often, sometimes, seldom and never, and the scoring was as follows:

Frequency	Score
Always	5
Often	4
Sometimes	3
Seldom	2
Never	1

The communication skill score for an individual was obtained by adding up the score assigned to the response pattern for the seven statements.

Communication skill of the farmer-demonstrators alone was measured in this study.

C. Perception of the farmers about the methodology followed in conducting the demonstrations

Perception was measured in this study with the help of an arbitrary scale developed for the purpose. Perception was measured in terms of the appropriateness with which the important steps were followed in conducting the National Demonstrations. Sixteen such relevant items were selected and the respondents were asked to indicate against each item whether the methodology followed was most appropriate, appropriate, undecided, less appropriate or least appropriate. The scores given were five for most appropriate, four for appropriate, three for undecided, two for less appropriate and one for least appropriate. The scores for each item added together for a farmer was taken as his perception score. The mean perception score was calculated for each category of the respondents.

D. Constraints experienced by the farmer-demonstrators in conducting National Demonstration

Based on discussion with officials of National Demonstration Program and farmers and also through review of relevant literature, the constraints faced by the farmer-demonstrators were collected. A list containing seventeen such constraints was included in the final interview schedule.

The response to each constraint was obtained on a four-point continuum, viz. 'most felt', 'felt', 'less felt' and 'least felt'. In order to rank the constraints, a cumulative index was calculated. For this, a weightage of '4' was given to the response, 'most felt', '3' to 'felt', '2' to 'less felt' and '1' to the 'least felt'. The frequency of response under each category was multiplied with the corresponding weightage and added up to get a cumulative index for the particular constraint. The ratio between the cumulative index and the frequency of responses for each constraint was worked out. Based on this ratio, the constraints were ranked.

V. Techniques employed in data collection

Personal interview method was used for collecting data from the respondents. The draft schedule was pretested in a pilot study in the National Demonstration area of 1983-'84 and 1984-'85. Suitable modifications were made in the schedule on the basis of the pilot study.

Data collection was carried out during August-September, 1986. The interview schedule was prepared in Malayalam and the respondents were individually interviewed and their responses were recorded.

VI. Statistical methods employed

1. Students' 't' test

Students' 't' test was used to test the significance of difference between means to compare the farmer-demonstrators and neighbouring farmers with respect to their knowledge about, and adoption of the demonstrated practices and attitude towards the National Demonstration Program. The following formula was used for unequal sample sizes.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1-1)\, S_1^2 + (n_2-1)\, S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

where,

$\bar{X}_1$ = mean of sample 1

$\bar{X}_2$ = mean of sample 2

S_1 = standard deviation of sample 1

S_2 = standard deviation of sample 2

n_1 = size of sample 1

n_2 = size of sample 2

t = computed value for t

2. Cochran's approximate test

Since the variances differed significantly, to test the significance of difference in the means scores of farmer-demonstrators and neighbouring farmers, with respect to their attitude towards the demonstrated practices and perception about the methodology followed in conducting the demonstrations, Cochran's approximate test was employed, using the following formula.

$$\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{s_1^2/n_1 + s_2^2/n_2}}$$

The critical value for this variate was calculated as,

$$\frac{s_1^2/n_1 \quad t_{n_1-1} + s_2^2/n_2 \quad t_{n_2-1}}{s_1^1/n_1 + s_2^2/n_2}$$

3. Simple Correlation Analysis

To study the association between each independent variable and the dependent variables, simple correlation analysis was done.

The formula used was,

Correlation coefficient, $$r = \frac{\Sigma xy - \frac{\Sigma x \ \Sigma y}{n}}{\sqrt{\Sigma x^2 - \frac{(\Sigma x)^2}{n} \times \Sigma y^2 - \frac{(\Sigma y)^2}{n}}}$$

where x = independent variable
y = dependent variable
n = number of observations

4. Multiple Correlation and Regression Analyses

As mere relationship of the variables studied in isolation will not throw light as to how much they actually contribute to 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 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 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.

$$Y_1 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12}$$

in the case of the farmer-demonstrators, and

$$Y_1 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11}$$

in the case of the neighbouring farmers, where;

a = constant

b_1 = the coefficient which appears in the equation which represents the amount of change in Y_1 that can be associated with unit increase in 'X_1' with the remaining independent variables held fixed. This is referred to as partial regression coefficient or partial 'b'.

Y_1 = Knowledge about the demonstrated practices

Y_2 = Attitude towards the demonstrated practices

Y_3 = Adoption of the demonstrated practices

Y_4 = Attitude towards the National Demonstration Program

X_1 = Age

X_2 = Socio-economic status

X_3 = Mass media participation

X_4 = Cosmopoliteness

X_5 = Extension orientation

X_6 = Crop yield index

X_7 = Economic performance index

X_8 = Scientific orientation

X_9 = Management orientation

X_{10} = Rationality in decision-making

X_{11} = Innovation-proneness

X_{12} = Communication skill

Since the independent variables were measured in different units, partial coefficients or b's could not be considered as such as the relative abilities of the independent variables to predict changes in the dependent variables. For example, age was measured in years, socio-economic status in scores, etc. Therefore, comparison of a unit change in one variable with unit change in another becomes meaningless without some form of correction. Hence, 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.

5. Step-wise Regression Analysis

This was done to know the relative effect of the independent variables in predicting the dependent variable and for elimination of unimportant variables. The best fitting regression equation of dependent variable on independent variables was predicted by applying step-wise regression as suggested by Draper and Smith (1966).

RESULTS AND DISCUSSION

IV RESULTS AND DISCUSSIONS

The findings of the present study and the discussions on these results are presented in this chapter under the following broad sub-heads.

1. Comparison of the mean scores of the respondents on the four dependent variables.
2. Relationship between the dependent and the independent variables.
3. Perception of the farmers about the methodology followed in the conduct of National Demonstrations.
4. Constraints experienced by the farmer-demonstrators in conducting National Demonstrations.

1. Comparison of the mean scores of the respondents on the four dependent variables

1.1. Knowledge of the farmers about the demonstrated cultivation practices

Table 1. Mean scores of the respondents on knowledge about the demonstrated practices.

Respondents	Mean knowledge score	"t" value
Farmer-demonstrators (n = 46)	12.39	5.79 **
Neighbouring farmers (n = 100)	10.01	

** Significant at 1% level of probability

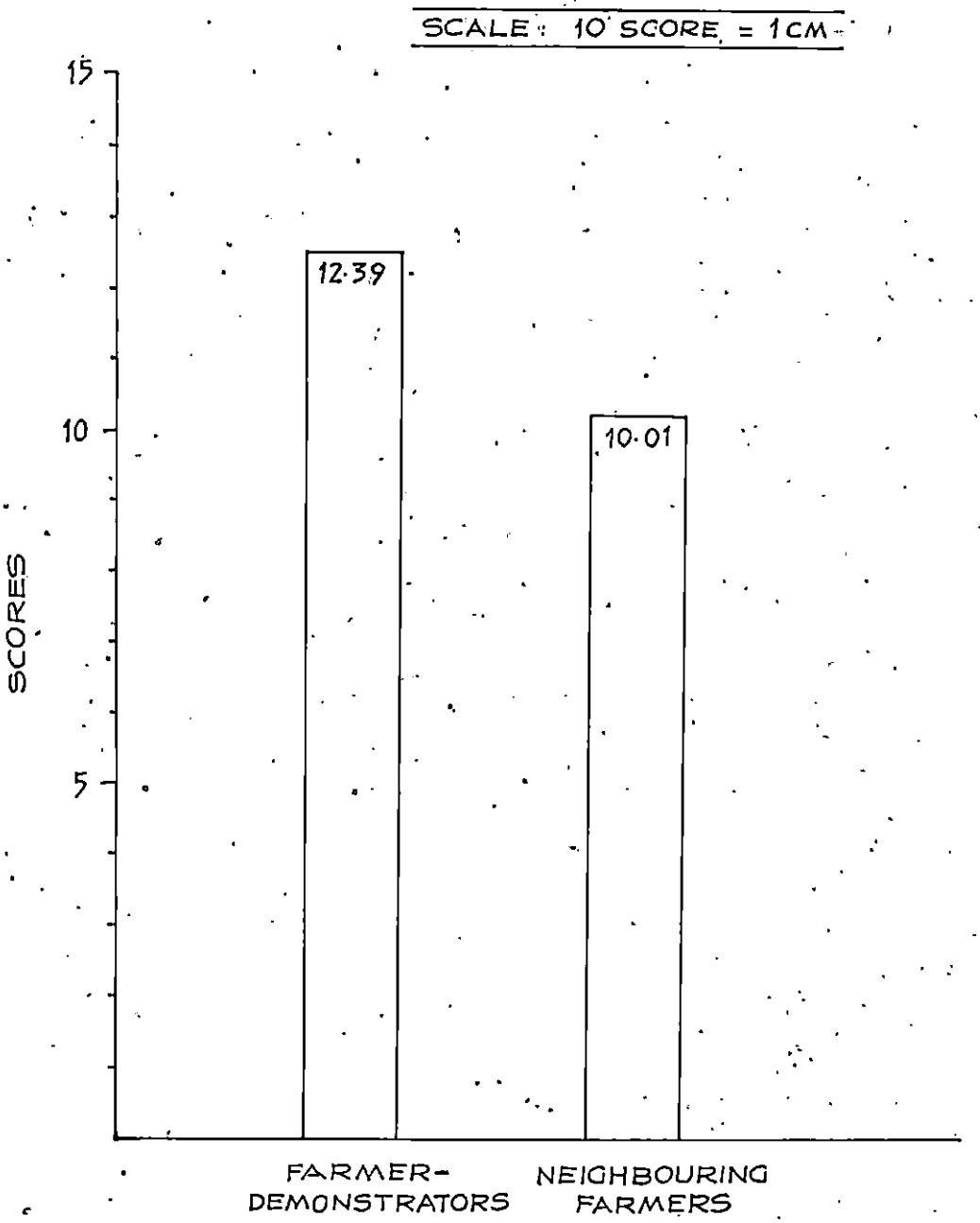


FIG. 3 MEAN SCORES OF THE RESPONDENTS ON KNOWLEDGE ABOUT THE DEMONSTRATED CULTIVATION PRACTICES

The data in Table 1 and Fig. 3 show a higher mean knowledge score for the farmer-demonstrators (12.39) than that of the neighbouring farmers (10.01) which when tested evidenced that this difference was significant. This significant superiority of the farmer-demonstrators in their knowledge might be due to their close exposure to the demonstrations conducted, or more appropriate to say their learning by doing.

In the National Demonstration areas, various extension activities such as field days, seminars and group discussion were conducted in collaboration with the Department of Agriculture. These were designed to impart knowledge on the demonstrated cultivation practices of paddy. Most of these activities were attended only by the farmer-demonstrators. The neighbouring farmers could not derive any benefit from these activities due to inadequate publicity given to these activities. The lack of interest on the part of the neighbouring farmers to participate in the extension activities could also be attributed to their low score on knowledge.

The significantly higher level of knowledge of the farmer-demonstrators over the neighbouring farmers is in confirmity with the related findings of Singh (1968),

Jha and Sharma (1972), Singh and Singh (1974), Ravikumar (1978), Pathak et al. (1979), Kamarudeen (1981), Hirevenkaragoudar et al. (1984) and Nikam and Singh (1984).

Therefore, the hypothesis set for the study that there would be no significant difference between the farmer-demonstrators and the neighbouring farmers with respect to their knowledge on the demonstrated practices was rejected.

1.2. Attitude towards the demonstrated cultivation practices.

Table 2. Mean scores of the respondents on attitude towards the demonstrated practices.

Respondents	Mean attitude score	"t" value
Farmer-demonstrators (n = 46)	140.91	6.93 **
Neighbouring farmers (n = 100)	131.96	

** Significant at 1% level of probability

The results furnished in Table 2 and Fig. 4 clearly indicated that the mean attitude score of the farmer-demonstrators was significantly higher than that of the neighbouring farmers.

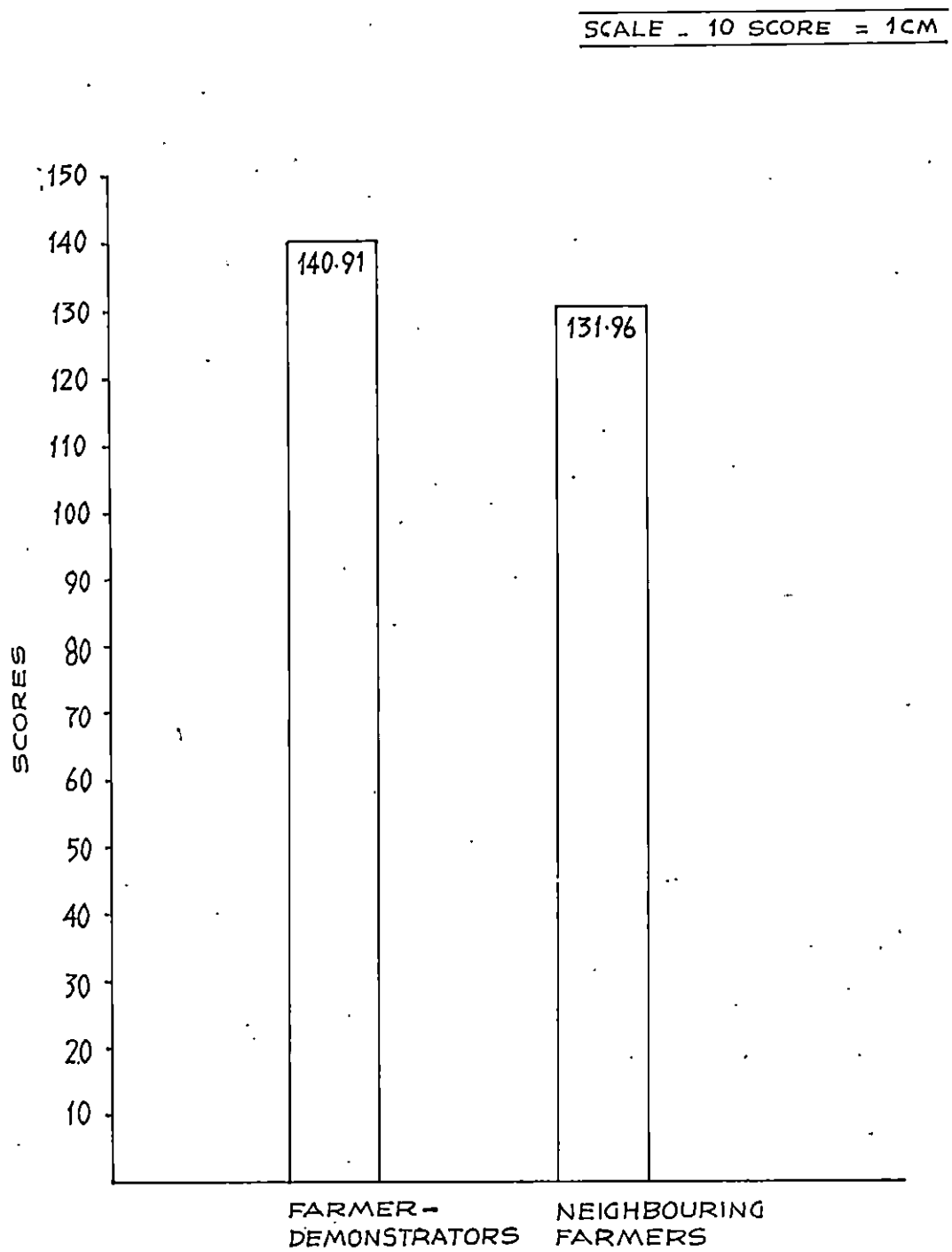


FIG. 4 MEAN SCORES OF THE RESPONDENTS ON ATTITUDE TOWARDS THE DEMONSTRATED CULTIVATION PRACTICES

The farmer-demonstrators who were directly involved in the demonstrations and various other activities under the program were obviously convinced of the superiority of the practices and had developed favourable attitude towards the improved practices. This result is in confirmity with the findings of Singh and Singh (1974), Pathak et al. (1979), Kamarudeen (1981) and Nikam and Singh (1984).

Hence, the hypothesis that, there would be no difference between the farmer-demonstrators and the neighbouring farmers in respect of their attitude towards the demonstrated practices was rejected.

1.3. Adoption of the demonstrated practices

Table 3. Mean scores of the respondents on adoption of the demonstrated practices.

Respondents	Mean Adoption Score	't' value
Farmer-demonstrators (n = 46)	13.30	11.72 **
Neighbouring farmers (n = 100)	10.31	

** Significant at 1% level of probability

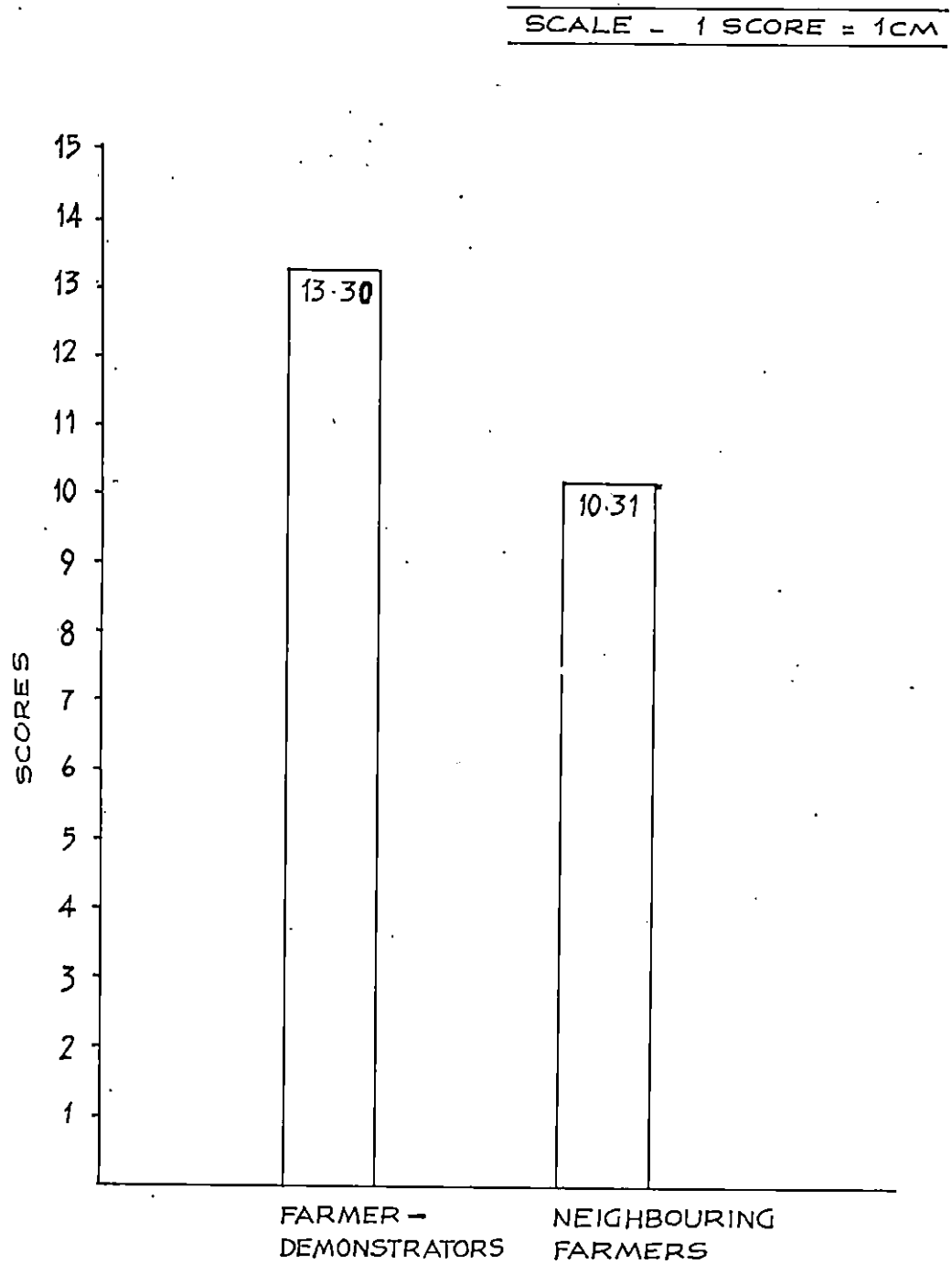


FIG. 5 MEAN SCORES OF THE RESPONDENTS ON ADOPTION OF THE DEMONSTRATED CULTIVATION PRACTICES

It was clearly indicated by the results in Table 3 and Fig. 5 that the mean adoption score of the farmer-demonstrators was significantly higher than that of the neighbouring farmers. This could be construed as the significant impact of the National Demonstrations. Moreover, the farmer-demonstrators were also supplied with the critical inputs for cultivation which motivated them to follow the improved cultivation practices. It is also quite logical that when the farmer-demonstrators had more knowledge about the demonstrated practices and when their attitude was also favourable, they would, by all means, adopt these improved practices.

The above result is in line with the findings reported by Rao (1971), Jha and Sharma (1972), Singh and Singh (1974), Oliver et al. (1975), Ravikumar (1978), Pathak et al. (1979), Hirevenkanagoudar et al. (1984), Kibey et al. (1984) and Nikam and Singh (1984).

In view of this, the hypothesis that there would be no significant difference between the farmer-demonstrators and the neighbouring farmers with respect to their levels of adoption of the demonstrated practices was rejected.

1.4. Attitude towards National Demonstration Program

Table 4. Mean scores of the respondents on attitude towards National Demonstration Program.

Respondents	Mean Attitude score	't' value
Farmer-demonstrators (n = 46)	41.24	11.97 **
Neighbouring farmers (n = 100)	32.67	

** Significant at 1% level of probability

It was unequivocally proved from the data in Table 4 and Fig. 6, that the farmer-demonstrators and the neighbouring farmers differed significantly in their mean scores on attitude towards National Demonstration Program.

Under the National Demonstration Program, the scientists come into direct contact with the farmer-demonstrators and give them timely guidance and advice. The interpersonal contacts create rapport and lead to the development of favourable attitude towards the program among the participants. Moreover, the farmers were supplied with critical inputs-free of cost-for conducting the demonstrations. These farmers were provided with opportunities to take part in seminars and discussions conducted

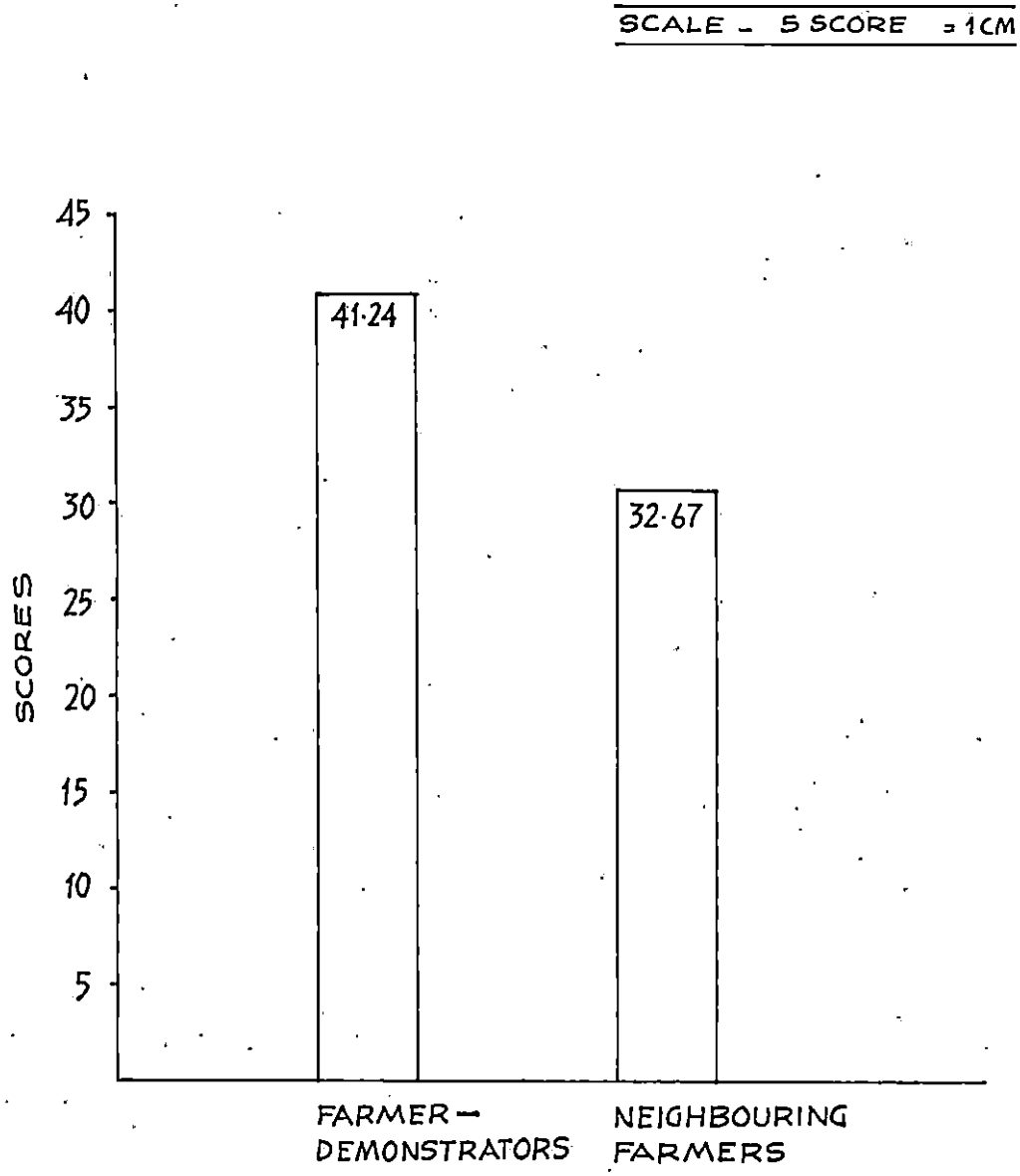


FIG. 6 MEAN SCORES OF THE RESPONDENTS ON ATTITUDE TOWARDS NATIONAL DEMONSTRATION PROGRAM

at the project office and at the demonstration plots. Being active participants, the farmer-demonstrators were convinced of the superiority of scientific agriculture and the benefits they derived from the program enabled them to develop favourable attitude towards it. This result is in line with the related findings reported by Mani and Knight (1981) and Ramalingam (1981).

The relatively low score obtained by the neighbouring farmers in this respect was indicative of the fact that the program was not successful in achieving its objective of changing the attitude of the farmers in the entire padasekharams.

Based on the above finding, the hypothesis that there would be no significant difference between the farmer-demonstrators and the neighbouring farmers with regard to their attitude towards National Demonstration Program was rejected.

2. Relationship between the dependent and the independent variables

2.1. Relationship between the respondents' knowledge about the demonstrated cultivation practices and the independent variables

The correlation coefficients showing the relationship

between knowledge of the farmers about the demonstrated cultivation practices and the independent variables are furnished in Table 5.

Table 5. Correlation between the independent variables and the farmers' level of knowledge about the demonstrated cultivation practices.

Variable No.	Name of the Independent variable	Correlation coefficient 'r'	
		Farmer-demonstrators (n = 46)	Neighbouring farmers (n = 100)
X_1	Age	0.1325^{NS}	0.0230^{NS}
X_2	Socio-economic status	0.3471^{*}	0.3923^{**}
X_3	Mass media participation	0.3261^{*}	0.2965^{**}
X_4	Cosmopoliteness	0.0158^{NS}	0.3156^{**}
X_5	Extension Orientation	0.3028^{*}	0.3967^{**}
X_6	Crop yield index	0.3815^{**}	0.2488^{*}
X_7	Economic performance index	0.0673^{NS}	0.1241^{NS}
X_8	Scientific orientation	0.4085^{**}	0.3033^{**}
X_9	Management orientation	0.5814^{**}	0.3616^{**}
X_{10}	Rationality in decision-making	0.0689^{NS}	0.4672^{**}
X_{11}	Innovation-proneness	0.3638^{*}	0.4108^{**}
X_{12}	Communication skill	0.5533^{**}	

* Significant at 5 percent level of probability

** Significant at 1 percent level of probability

NS Not significant

Age indicated positive but non-significant association with the knowledge level of both the farmer-demonstrators and the neighbouring farmers. This points out to the generalisation that whether young or old, farmers try to acquire knowledge if exposed to information sources. This result is in agreement with those obtained by Kaleel (1978), Ahmed (1981), Sushama et al. (1981) and Philip (1984).

The positive and significant association of the variable, socio-economic status of both the categories of farmers with their knowledge indicates that the farmers with high socio-economic status having higher income, education and social participation were in a better position to gather as much knowledge about the various agricultural practices. Closely related results were reported by Vijayaraghavan (1977) and Senthil (1983).

Mass media participation was also found to have positive and significant relationship with the level of knowledge of the farmers about the demonstrated practices. Mass media such as the radio, television and newspapers, now-a-days give due importance to agricultural programs and bring to the farmers practical knowledge on improved cultivation practices of various crops. The proverbial

'Teacher' and 'Forum' functions of mass media could well be related here.

The above finding is being supported by Sohal and Tyagi (1978), Manivannan (1980), Haraprasad (1982), Chandrakandan (1982), Senthil (1983) and Godhandapani (1985).

The cosmopolitan behaviour of the neighbouring farmers helped them to gather more correct knowledge about improved paddy cultivation practices, as indicated by the significant correlation of their cosmopoliteness with the dependent variable. In the case of the farmer-demonstrators, the relationship was not significant. This may be due to the fact that their orientation outside their immediate village and contact with outside agencies did not help them much in gaining knowledge on improved crop cultivation practices. But their high score on knowledge about the demonstrated practices could mostly be attributed to their participation in National Demonstrations.

The positive significant association between knowledge and cosmopoliteness is supported by Vijayakumar (1983) and Viju (1985).

There was positive and significant correlation

between extension orientation and the dependent variable in the case of both the categories of farmers. As a farmer's contact with extension agencies and involvement in extension activities increase, he will be exposed to improved technologies in agriculture more and more. This will help in increasing his knowledge on improved practices. The T & V approach of agricultural extension followed in the State also provides for frequent interaction between the extension personnel and the farmers. These could be attributed as the reasons for the positive and significant association of extension orientation with the knowledge level of the farmers. This finding is in agreement with those reported by Vijayaraghavan (1977), Manivannan (1980), Kamarudeen (1981), Haraprasad (1982), Senthil (1983) and Godhandapani (1985).

Crop yield index explicated positive and significant relationship with the level of knowledge of both the farmer-demonstrators and the neighbouring farmers. It is quite likely that farmers, who are interested in scientific cultivation and reap high yields, search for further details of the improved practices, substantiating the reciprocal cause-effect relationship between these two variables.

The non-significant association between the economic

performance index and the farmers' level of knowledge might be possibly explained on the basis of the fundamental differentiation between these two variables. While knowledge is a cognitive component of human behaviour, economic performance is a conative component. This discrepancy between cognitive and conative components of human behaviour is further substantiated by the writings of Fishbein (1973).

Scientific orientation had positive and significant relationship with the level of knowledge of both the farmer-demonstrators and the neighbouring farmers, as explained by the data in Table 5. As a farmer is favourably oriented to the scientific findings in agriculture, his knowledge about different aspects of modern crop production will also be high. The latest agricultural technologies warrant the farmers to have scientific bent of mind to enable better comprehension. In the light of the above, it is only logical to expect that as the scientific orientation of a farmer increases, proportionate increase could be expected in his knowledge also. This finding is in agreement with those reported by Manivannan (1980), Kamarudeen (1981), Senthil (1983) and Krishnamoorthi (1984).

Management orientation of both the categories of

respondents showed positive and significant association with their level of knowledge about the demonstrated practices. This finding was in conformity with that of Kamarudeen (1981). Well judged decisions on planning, production and marketing can be made only when there is complete and comprehensive information. Thus a farmer with high level of knowledge about the demonstrated cultivation practices would be able to take up rational management decisions. These days, when knowledge is equated to power and when managements increasingly rely upon information systems for rational decisions, it is only within the limits of generalisation to postulate that one's management orientation will have positive association with his level of knowledge

Rationality in decision-making was found to have non-significant relationship with the level of knowledge of the farmer-demonstrators, whereas it had positive and significant association with that of the neighbouring farmers. Rationality in decision-making calls for the consideration of all possible courses of action to achieve a goal and selection of the most appropriate alternative to reach the goal. Obviously, this warrants a fund of knowledge on the part of the decision-maker. Since farmers have to take rational decisions every now and then to

maximise returns from their farm resources, it is only natural to expect that farmers exhibiting high rationality in decision-making will also have sound knowledge on the appropriate production technologies.

Innovation-proneness showed positive and significant association with the level of knowledge of the farmer-demonstrators and the neighbouring farmers. While theorising the typology of innovative farmers, Rogers and Shoemaker (1971) have also postulated such a relationship. The inquisitiveness and curiosity arising out of a farmer's search for efficient and latest farm technologies, leads him to gather a fund of knowledge on improved technologies and this phenomenon could be related here to explain the positive association between these two variables under study.

Communication skill of the farmer-demonstrators was found to have positive and significant association with their knowledge about the improved practices (Table 5). This was in agreement with the assumption made that those farmers with good communication skill gather more knowledge which would help them in communicating the technology to their peers effectively. This is particularly so in the case of the farmer-demonstrators who are considered to be

the key-communicators under the National Demonstration Program.

The results of multiple regression analysis showing the contribution of the selected independent variables, acting together, in the variations in the knowledge of the farmer-demonstrators are furnished in Table 6(a).

It was found that 57.93 percent of the variation in the knowledge of the farmer-demonstrators was due to the 12 variables included, as indicated by the coefficient of determination (R^2). This variation was found to be significant as explained by the F value.

The regression equation is

$$Y_1 = -2.210 + 0.035\ X_1 + 0.017\ X_2 + 0.111\ X_3 + -0.222\ X_4 + -0.085\ X_5 + 0.021\ X_6 + 0.002\ X_7 + 0.178\ X_8 + 0.451\ X_9 + -0.319\ X_{10} + 0.005\ X_{11} + 0.154\ X_{12} +$$

The best fitting regression equation was obtained through the step-wise regression analysis, the results of which are given in Table 6(b).

Of the total variation of 57.93 percent explained by all the 12 variables together, 46.07 percent was explained

Table 6(a). Partial regression coefficients for the level of knowledge of the farmer-demonstrators and the independent variables (n = 46).

Variable number	Variables	Partial regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_1	Age	0.0348	0.025	1.380^{NS}	0.1845
X_2	Socio-economic status	0.0172	0.016	1.085^{NS}	0.2004
X_3	Mass media participation	-0.1113	0.155	-0.717^{NS}	-0.1172
X_4	Cosmopoliteness	-0.2217	0.196	-1.129^{NS}	-0.1524
X_5	Extension orientation	-0.0848	0.140	-0.607^{NS}	-0.0923
X_6	Crop yield index	0.0210	0.010	2.094^{*}	0.3770
X_7	Economic performance index	-0.0019	0.001	-1.282^{NS}	-0.2357
X_8	Scientific orientation	0.1776	0.166	1.069^{NS}	0.1704
X_9	Management orientation	0.4510	0.247	1.827^{NS}	0.3805
X_{10}	Rationality in decision-making	-0.3189	0.382	-0.834^{NS}	-0.1181
X_{11}	Innovation-proneness	0.0050	0.436	0.011^{NS}	0.0017
X_{12}	Communication skill	0.1538	0.099	1.561^{NS}	0.2561

$R^2 = 0.5793$ $F = 3.786^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

Table 6(b). Results of the step-wise regression analysis showing the final step with all the significant variables included in the study of the level of knowledge of the farmer-demonstrators about the demonstrated practices (n = 46).

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_{12}	Communication skill	0.2828	0.0668	4.2302**	0.4713
X_6	Crop yield index	0.0156	0.0062	2.5282*	0.2807
X_8	Scientific orientation	0.3284	0.1155	2.8430**	0.3153

$\bar{R}^2$ = 0.46075 F = 13.8169**

$\bar{R}^2$ = Coefficient of determination adjusted for degrees of freedom

* Significant at 5% level of probability

** Significant at 1% level of probability

by three variables viz., communication skill (X_{12}) scientific orientation (X_8) and crop yield index (X_6). The variation contributed by these three variables was proved significant by the F value.

The final regression equation is given below.

$$Y_1 = -9.1651 + 0.2828^{**}X_{12} + 0.3284^{**}X_8 + 0.0156^{*}X_6 +$$

The results showed that a unit increase in the farmer-demonstrators' communication skill resulted in an increase of 0.2828 unit of their knowledge about the demonstrated cultivation practices, other factors being kept constant. With a unit increase in scientific orientation, their knowledge was increased by 0.3284 units. A unit increase in crop yield index would increase the knowledge of the farmer-demonstrators by 0.0156 unit, cetaris paribus.

The relationship between the independent variables and the dependent variable-knowledge of the neighbouring farmers-and the efficiency of these variables in predicting the variations in the dependent variable are presented in Tables 6(c) and 6(d).

All the eleven variables taken for the multiple regression analysis jointly explained 37.59 percent of the

Table 6(c). Partial regression coefficients for the level of knowledge of the neighbouring farmers and the independent variables (n = 100).

Variable number	Variables	Partial regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_1	Age	-0.0051	0.017	-0.295^{NS}	-0.0264
X_2	Socio-economic status	0.0246	0.020	1.221^{NS}	0.1363
X_3	Mass media participation	0.1043	0.081	1.292^{NS}	0.1177
X_4	Cosmopoliteness	0.0696	0.145	0.479^{NS}	0.0516
X_5	Extension orientation	0.1831	0.107	1.713^{NS}	0.1815
X_6	Crop yield index	0.0077	0.007	1.054^{NS}	0.0998
X_7	Economic performance index	-0.0009	0.001	-0.789^{NS}	-0.0725
X_8	Scientific orientation	0.0903	0.085	1.060^{NS}	0.1067
X_9	Management orientation	0.0271	0.149	0.182^{NS}	0.0203
X_{10}	Rationality in decision-making	0.3204	0.186	1.718^{NS}	0.1901
X_{11}	Innovation-proneness	0.3193	0.248	1.285^{NS}	0.1364

$R^2 = 0.3759$ $F = 4.819^{**}$

** Significant at 1% level of probability

NS Not significant

Table 6(d). Results of the step-wise regression analysis showing the final significant step with all the significant variables included in the study of the level of knowledge of the neighbouring farmers about the demonstrated practices. (n = 100)

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_{10}	Rationality in decision-making	0.4276	0.1697	2.5191*	0.2510
X_{11}	Innovation-proneness	0.4309	0.2254	1.9115NS	0.1845
X_2	Socio-economic status	0.0318	0.0175	1.8198NS	0.1759
X_5	Extension orientation	0.1966	0.0957	2.0530*	0.1944

$\bar{R}^2 = 0.31178$ $F = 12.2125^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

variation in the knowledge of the neighbouring farmers which was found significant.

The regression equation is,

$$Y_1 = -3.969 + -0.005X_1 + 0.025X_2 + 0.104X_3 + 0.070X_4 + 0.183X_5 + 0.008X_6 + -0.001X_7 + 0.090X_8 + 0.027X_9 + 0.320X_{10} + 0.319X_{11} +$$

On an examination of Table 6(d), it could be seen that out of the total 37.59 percent variation explained by the 11 independent variables together, 31.17 percent was explained by the four variables, X_{10}, X_{11}, X_2 and X_5. This variation was found to be significant as proved by the F value.

The final regression equation is as follows:

$$Y_1 = -0.9136 + 0.4276^{*}X_{10} + 0.1966^{*}X_5 + 0.4309X_{11} + 0.0318X_2 +$$

Based on the above results, the hypothesis that there would be no significant contribution of the set of selected independent variables in the variations in the knowledge of the farmers was rejected.

2.2. Relationship between the respondents' attitude towards the demonstrated practices and the independent variables

The data on the relationship of the independent

variables with the attitude of the respondents towards the demonstrated practices in the National Demonstrations are furnished in Table 7.

Table 7. Correlation between independent variables and farmers' attitude towards the demonstrated cultivation practices.

Variable No.	Name of the independent variable	Correlation coefficient 'r'	
		Farmer-demonstrators (n = 46)	Neighbouring farmers (n = 100)
X_1	Age	-0.1372^{NS}	-0.0072^{NS}
X_2	Socio-economic status	0.3419^{*}	0.3339^{**}
X_3	Mass media participation	0.2953^{*}	0.1153^{NS}
X_4	Cosmopoliteness	-0.0213^{NS}	0.3680^{**}
X_5	Extension orientation	0.3414^{*}	0.1848^{NS}
X_6	Crop yield index	0.3273^{*}	0.2375^{*}
X_7	Economic performance index	0.1755^{NS}	0.1194^{NS}
X_8	Scientific orientation	0.5563^{**}	0.4788^{**}
X_9	Management orientation	0.6380^{**}	0.5082^{**}
X_{10}	Rationality in decision-making	0.0207^{NS}	0.4634^{**}
X_{11}	Innovation-proneness	0.3546^{*}	0.4165^{**}
X_{12}	Communication skill	0.3429^{*}	

* Significant at 5 percent level of probability

** Significant at 1 percent level of probability

NS Not significant

Age was found to have negative, but non-significant relationship with the attitude of both the categories of farmers towards the demonstrated cultivation practices. It is quite often seen that the young farmers show a high degree of interest and enthusiasm to acquire more knowledge about scientific practices, and thereby develop favourable attitudes towards the modern practices. They are more progressive in their outlook and have a positive orientation towards change. The sensitiveness to changes that occur every now and then around might deteriorate as a result of aging. This finding is on par with those of Kamarudeen (1981), Vijayakumar (1983) and Singh and Kunzroo (1985).

In the case of the farmer-demonstrators and the neighbouring farmers, socio-economic status showed positive and significant association with their attitude towards the demonstrated cultivation practices. The farmers with high socio-economic status have obviously utilised their resources for the accumulation of knowledge or to participate actively in the extension programs so as to get convinced of the superiority of the scientific practices and to get changed in their attitudes. These results are in conformity with the findings of Singh and Singh (1970), Choukidar and George (1972) and Lokhande (1973).

Mass media participation showed positive and significant association with the attitude towards demonstrated practices held by the farmer-demonstrators, while it was not significant in the case of the neighbouring farmers. The correct and relevant informations received through the mass media programs increase the farmers' knowledge, thus creating favourable attitude towards the improved practices. This result is in complete agreement with the finding of Mani and Knight (1981).

Cosmopoliteness was found to have negative but non-significant association with the attitude of farmer-demonstrators towards the demonstrated practices, whereas it showed positive and significant association with that of the neighbouring farmers. Greater contacts outside the village broaden the mental horizon and lead the farmers to know more about the techniques of modern crop production. This ultimately may lead them to develop favourable attitudes toward the demonstrated practices as was found among the neighbouring farmers. This result is in line with the finding of Vijayakumar (1983). But the trend shown among the farmer-demonstrators indicated that their visits outside their own villages did not profit them in any way in developing favourable attitudes toward the practices. The

visits they made to neighbouring towns might have turned out to be sheer waste of time and resources. Moreover, the high attitude scores they obtained might be because of their active participation in the demonstration program alone and the impact of their cosmopoliteness on their attitudes might have been adverse.

Extension orientation indicated positive relationship with the farmers' attitude towards the demonstrated practices, which was significant in the case of the farmer-demonstrators. The association of the farmers with University Scientists, experts of the National Demonstration Program and other extension officers, and their participation in various extension activities would enable them to increase their knowledge about scientific agriculture. It is quite rational to think that knowledgeable farmers would develop favourable attitude towards the improved practices, as evidenced by the positive relationship between the independent and the dependent variable in the case of the farmer-demonstrators.

Both in the case of the farmer-demonstrators and the neighbouring farmers, their attitude towards the demonstrated practices was significantly influenced by their crop yield. Since the relationship showed was positive,

it may be concluded that those farmers, who had better yields per unit area, might have developed favourable attitude towards the demonstrated practices.

There was no significant relationship between economic performance index and the farmers' attitude towards the demonstrated practices. The absence of any significant relationship between these two variables could be linked to the differences in their basic attributes with the former being a conative element and the latter a cognitive element of human behaviour.

Scientific orientation indicated positive and significant association with the attitude of both the categories of respondents towards the demonstrated practices. This relationship is within the limits of logic in that the scientifically oriented people will look at technologies with proper perspectives which would help them to shape positive attitudes also towards these technologies. The above result is in line with that reported by Kamarudeen (1981).

Management orientation also was found positively and significantly related to the farmers' attitude towards the demonstrated practices. It is obvious that a farmer's management orientation will reflect in his endeavour to

achieve higher farm production. Only those with favourable attitude towards improved production practices will take up planned decisions in crop production. This could be attributed as the possible reason for the above result. The study of Kamarudeen (1981) also emitted similar finding.

The positive but non-significant association of the farmer-demonstrators' rational behaviour in decision-making and their attitude towards the demonstrated practices may be explained as follows. Rational decision-making in crop production will lead to the desired end and help the farmers develop favourable attitude towards the practices. But the influence of this variable on the farmer-demonstrators' attitude was not significant, whereas it was highly significant and positive in the case of the neighbouring farmers. Hence it could be concluded that it was not their rationality in decision-making but their involvement in National Demonstrations that facilitated the farmer-demonstrators to develop favourable attitude towards the practices.

Innovation-proneness was found to have positive and significant relationship with the dependent variable in either categories of respondents. The positive trend may be due to the fact that the farmers with high interest

to adopt new ideas in their own farms, search for information, learn by observing and doing and experiencing results for themselves. The superiority of the demonstrated practices might have led to the development of favourable attitudes towards these improved practices among the farmers. This finding is in conformity with that reported by Philip (1984).

Communication skill of the farmer-demonstrators showed positive and significant relationship with their attitude towards the demonstrated cultivation practices. Farmers with appreciable communication skills, in their desire to improve these skills, would seek more and more information on scientific cultivation practices thereby developing favourable attitudes toward these practices. This tendency could probably be attributed to the positive and significant relationship between communication skill and attitude of the farmer-demonstrators towards the demonstrated cultivation practices.

The results of multiple regression and step-wise regression analyses furnished in Tables 7(a) and 7(b), point out to the contributions of the set of independent variables in explaining the variations in the dependent variable.

Table 7(a). Partial regression coefficients for attitude of the farmer-demonstrators towards the demonstrated practices and the independent variables. (n = 46)

Variable number	Variables	Partial regression coefficient (b)	SE of 'b'	't' value	Standardised 'b'
X_1	Age	-0.0305	0.075	-0.408^{NS}	-0.0560
X_2	Socio-economic status	0.0575	0.047	1.228^{NS}	0.2319
X_3	Mass media participation	-0.3056	0.459	-0.666^{NS}	-0.1114
X_4	Cosmopoliteness	-0.9152	0.581	-1.575^{NS}	-0.2178
X_5	Extension orientation	0.0838	0.413	0.203^{NS}	0.0316
X_6	Crop yield index	0.0187	0.030	0.630^{NS}	0.1162
X_7	Economic performance index	0.0002	0.004	0.042^{NS}	0.00859
X_8	Scientific orientation	0.9732	0.491	1.981^{*}	0.3233
X_9	Management orientation	1.1090	0.731	1.518^{NS}	0.3239
X_{10}	Rationality in decision-making	0.0438	1.131	0.039^{NS}	0.0056
X_{11}	Innovation-proneness	0.8488	1.290	0.658^{NS}	0.1023
X_{12}	Communication skill	0.1261	0.292	0.432	0.0726

$R^2 = 0.5579$ $F = 3.470^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

Table 7(b). Results of the step-wise, regression analysis showing the final significant step with all significant variables included in the study of the attitude of the farmer-demonstrators towards the demonstrated practices (n = 46)

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_9	Management orientation	1.5685	0.4983	3.1480**	0.4596
X_8	Scientific orientation	0.8163	0.4099	1.9914*	0.2716
X_4	Cosmopoliteness	-0.9969	0.4855	-2.0534*	-0.2376
X_2	Socio-economic status	0.0518	0.0297	1.7413NS	0.2090

$\bar{R}^2 = 0.47416$ $F = 11.1442^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

The R^2 value (0.5579) explains that 55.79 percent of the variation in the attitude of the farmer-demonstrators towards the demonstrated cultivation practices was explained by the 12 independent variables together. This variation was found significant as indicated by the F value (Table 7(a).

The regression equation from the multiple regression analysis is as follows:

$$Y_2 = 77.048 + -0.030X_1 + 0.058X_2 + -0.306X_3 + -0.915X_4 + 0.084X_5 + 0.019X_6 + 0.000X_7 + 0.973X_8 + 1.109X_9 + 0.044X_{10} + 0.849X_{11} + 0.126X_{12} +$$

Data in Table 7(b) clearly indicated that the variables X_9, X_8, X_4 and X_2 together explained 47.41 percent of the total variation caused by the 12 independent variables on the dependent variable, which was found as significant.

The final regression equation predicting the attitude of the farmer-demonstrators towards the demonstrated cultivation practices is as follows:

$$Y_2 = 84.3605 + 1.5685\overset{*}{X}_9 + 0.8163\overset{*}{X}_8 + -0.9969\overset{*}{X}_4 + 0.0518X_2 +$$

The partial regression coefficients revealed that a unit increase in the management orientation of the farmer-demonstrators increased their attitude towards the demonstrated practices by 1.5685 units. Similarly an increase of 0.8163 unit in their attitude was caused by a unit increase in their scientific orientation. With a unit increase of the farmer-demonstrators' socio-economic status, their attitude towards the demonstrated practices was found to have increased by 0.0518 unit.

The results showing the influence of the independent variables on the neighbouring farmers' attitude towards the demonstrated practices are presented in Table 7(c).

All the 11 independent variables together contributed to 44.74 percent variation in the dependent variable, which was significant as shown by the F value (6.477).

The relative importance of the independent variables in predicting the attitude of the neighbouring farmers towards the demonstrated practices is explained by the final step of the step-wise technique of regression analysis, the results of which are furnished in Table 7(d).

Of the 44.74 percent variation in the dependent variable explained by the 11 independent variables, 39.97 percent was explained by the four variables X_9, X_8, X_{10}

Table 7(c). Partial regression coefficients for the attitude of the neighbouring farmers towards the demonstrated cultivation practices and the independent variables. (n = 100)

Variable number	Variables	Partial regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_1	Age	-0.0015	0.058	-0.026^{NS}	0.0021
X_2	Socio-economic status	-0.0327	0.067	-0.486^{NS}	0.0509
X_3	Mass media participation	-0.1599	0.269	-0.594^{NS}	0.0507
X_4	Cosmopoliteness	1.0079	0.485	2.077^{*}	0.2105
X_5	Extension orientation	-0.3024	0.357	-0.847^{NS}	0.0843
X_6	Crop yield index	0.0310	0.024	1.272^{NS}	0.1130
X_7	Economic performance index	-0.0037	0.004	-0.966^{NS}	0.0838
X_8	Scientific orientation	0.7498	0.284	2.637^{*}	0.2493
X_9	Management orientation	0.9920	0.496	2.000^{NS}	0.2095
X_{10}	Rationality in decision-making	1.3947	0.622	2.241^{*}	0.2327
X_{11}	Innovation-proneness	1.1501	0.829	1.387^{NS}	0.1382

$R^2 = 0.4474$ $F = 6.477^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

Table 7(d). Results of the step-wise regression analysis showing the final significant step with all the significant variables included in the study of the attitude of the neighbouring farmers towards the demonstrated practices (n = 100)

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_9	Management orientation	1.0861	0.4537	2.3940**	0.2291
X_8	Scientific orientation	0.8409	0.2590	3.2469**	0.2798
X_{10}	Rationality in decision-making	1.5606	0.5315	2.9361**	0.2582
X_4	Cosmopoliteness	0.6447	0.4157	1.5510NS	0.1347

$\bar{R}^2$ = 0.39976 F = 17.4838**

** Significant at 1% level of probability

NS Not significant

and X_4 alone, as presented in Table 7(d).

The final regression equation which was significant in predicting the dependent variable is given as,

$$Y_2 = 59.0962 + 0.8409^{**}X_8 + 1.5606^{**}X_{10} + 1.0861^{*}X_9 + 0.6447X_4 +$$

Based on these results, the hypothesis that there would be no significant contribution of the set of selected independent variables in the variations in the attitude of the farmers towards the demonstrated practices of paddy was rejected.

2.3. Relationship between the respondents' adoption of the demonstrated cultivation practices and the independent variables

The association between the independent variables and the farmer-demonstrators' adoption of the demonstrated practices is illumined in Table 8.

Age showed non-significant and positive relationship with the adoption behaviour of both the farmer-demonstrators and the neighbouring farmers. Whether young or old, those who are exposed to the scientific crop cultivation through various extension activities and convinced of its quality would adopt the practice. This could probably the reason

Table 8. Correlation between the independent variables and farmers' adoption of the demonstrated cultivation practices.

Variable No.	Name of the variable	Correlation coefficient 'r'	
		Farmer-Demonstrators (n = 46)	Neighbouring Farmers (n = 100)
X_1	Age	0.1547^{NS}	0.0045^{NS}
X_2	Socio-economic status	0.3123*	0.2112*
X_3	Mass media participation	0.2105^{NS}	0.1807^{NS}
X_4	Cosmopoliteness	0.1936^{NS}	0.1042^{NS}
X_5	Extension orientation	0.3038*	0.3384**
X_6	Crop yield index	0.2914*	0.3085**
X_7	Economic performance index	0.1365^{NS}	0.1147^{NS}
X_8	Scientific orientation	0.1753^{NS}	0.3986**
X_9	Management orientation	0.4724**	0.2598**
X_{10}	Rationality in decision-making	0.2114^{NS}	0.4154**
X_{11}	Innovation-proneness	0.4372**	0.2689**
X_{12}	Communication skill	0.3240*	

* Significant at 5 percent level of probability

** Significant at 1 percent level of probability

NS Not significant

for the phenomenon observed in this context.

The above reported non-significant association between the independent and the dependent variable draws support from the studies of Karim and Mahboob (1974), Sinha et al. (1974), Vellapandian (1974), Balasubrahmanian (1977), Pal et al. (1977), Palaniswamy (1978), Ravi (1979), Segar (1979), Thankaraju (1979), Vijayaraghavan (1979), Prakash (1980), Sohi and Kherde (1980), Kamarudeen (1981), Sushama et al. (1981), Singh (1983) and Philip (1984).

Socio-economic status of the farmers was positively and significantly related to their extent of adoption of the demonstrated practices as evidenced in Table 7. 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 utilise these resources for effective utilisation in crop production. It is quite natural that resourceful farmers try to adopt the improved practices at least on a limited scale. The above finding is similar to that reported by Jha and Shaktawat (1972), Palaniswamy (1978), Segar (1979), Thankaraju (1979), Prakash (1980), Sinha and Sinha (1980), Sushama et al. (1981) and Yadav and Jain (1984).

Mass media participation was positively but non-significantly associated with the farmer-demonstrators' adoption behaviour. It showed positive and non-significant association with that of the neighbouring farmers also. The messages they received through the mass media would have convinced the farmers about the advantages in the adoption of the improved cultivation practices. This may be the reason for the positive association shown in this regard.

These farmers who had less opportunity to make use of mass media sources for a change in their behaviour might have devoted more time to participate in what was available to them in their locality ie, the National Demonstrations. This could be the reason why they attained a higher mean score for adoption. The result obtained in this study is in line with those reported by Tyagi and Sohal (1984) and Nanjayan (1985).

Cosmopoliteness was found to have positive but non-significant association with the adoption level of both the categories of farmers. Though the farmer-demonstrators and the neighbouring farmers had outside contacts, these contacts might not have been basically meant for agricultural purposes. This result also points out to the diminishing influence of cosmopoliteness on the farmers' behaviour.

The non-significant association between the above independent variable and the farmers' adoption of improved practices was also reported by Vijayaraghavan (1977), Kamarudeen (1981) and Viju (1985).

The results presented in Table 8 showed that there was positive and significant association between extension orientation of the farmer-demonstrators and the neighbouring farmers and their adoption of the demonstrated practices.

Extension education 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. Any agricultural extension approach should emphasize on periodic and scheduled field visits by extension personnel to meet the farmers in order to provide them with timely information on agriculture. When such personal influence is wielded by the extension personnel, it is expected that farmers, who come into contact with them, will be motivated to take up latest agricultural technologies for practise. This reciprocal influence is, of course, the basic tenet of the T & V approach, which

could be recalled to explain the present pattern of results. Similar findings were reported by Singh and Singh (1970), Grewal and Sohal (1971), Karim and Mahboob (1973), Sinha et al. (1974), Vellapandian (1974), Pal et al. (1977), Vijayaraghavan (1977), Bhaskaran (1979), Palaniswamy (1978), Ravi (1979), Segar (1979) and Thankaraju (1979).

The results relating to the association of crop yield with the adoption behaviour of the respondents indicate that it was positive and significant in the case of the farmer-demonstrators and the neighbouring farmers. The positive relationship between these two variables could be traced to the mutual influence between these two variables. When adoption was of the high order, it resulted in higher crop yields and when crop yields were higher, farmers went in for continued use of the technology in the ensuing seasons so as to stabilise the high crop yields they obtained earlier. Channegowda (1971), Sinha and Kolte (1974), Samantha (1977), Ramalingegowda (1978) and Bhaskaran (1979) also reported similar trend.

Economic performance index exhibited positive, but non-significant relationship with the level of adoption of the demonstrated practices among the two categories of respondents. When people find that the output from their

enterprise was increasing, they will go in search of means for ensuring better production. This leads them to the adoption of improved practices. This could be the reason for the positive influence. However, the non-significant relationship obtained in this regard could be attributed to the measurement of economic performance index in the study. While level of adoption was measured in terms of selected practices for paddy, economic performance was quantified taking into consideration the performance of the farmer in four different crop enterprises viz., paddy, coconut, banana and tapioca.

Table 8 clearly indicated the prevalence of positive but non-significant association between scientific orientation of the farmer-demonstrators and their level of adoption of the demonstrated practices. In the case of the neighbouring farmers, scientific orientation showed positive and significant association with their adoption of the demonstrated practices. Scientifically oriented farmers normally have correct perception about the improved cultivation practices which might lead to the adoption of the demonstrated practices.

From the above results, it could also be deduced that in the case of the farmer-demonstrators, it is not

their high scientific orientation but the effectiveness of the National Demonstration Program that resulted in their high score on adoption of the demonstrated practices.

The positive and significant association found between these two variables was supported by the findings of Vijayaraghavan (1977), Palaniswamy (1978), Aristotle (1981), Kamarudeen (1981), Nanjayan (1985) and Jayapalan (1985).

Management orientation showed positive and significant association with the adoption of both the categories of respondents. A farmer who has proper knowledge and ability to make wise decisions in planning, production and marketing of his enterprises undoubtedly will put to practise the improved and profitable technologies.

The significant association resulted was in line with the findings of Shanmukhappa (1978), Bhaskaran (1979) and Kamarudeen (1981).

It was observed that rationality in decision-making was having positive but non-significant influence on the adoption behaviour of the farmer-demonstrators, while it was positively and significantly associated with that of the neighbouring farmers.

A farmer who is rational in his decisions, will, before taking the decisions, probe deep into the profitability and practicability of the production method. This will lead him to take the decision to adopt the improved cultivation practices, which are quite superior in quality to the traditional methods. This could be the reason for the positive relationship between the independent and the dependent variable. This finding is in conformity with the results of Sawant and Thorat (1977).

Innovation-proneness was found to possess significant positive relationship with the adoption of the demonstrated practices by both the farmer-demonstrators and the neighbouring farmers. Innovative farmers always go in search of the new ideas in cultivation. They are quite enthusiastic to adopt these improved practices in their own land. This could be very well attributed to the observed result.

Positive and significant correlation was exhibited between communication skill and the farmer-demonstrators' adoption behaviour. Those who have good communication skill naturally spread their knowledge to their neighbours. To be blameless before others, they must be practising what they preach. Those farmers who communicated to others of the

importance of adopting the improved practices of paddy cultivation adopted the practices for themselves to a higher extent. This trait could be focussed to justify the positive and significant relationship between communication skill and adoption of the demonstrated cultivation practices by the farmer-demonstrators.

The results of the multiple regression and stepwise regression analyses showing the variation in the farmer-demonstrators' adoption of the demonstrated practices, contributed by the 12 variables acting together and the best fitting equation are furnished in Tables 8(a) and 8(b).

The regression equation from the multiple regression analysis is

$$Y_3 = 6.224 + 0.021X_1 + 0.012X_2 + \bar{0}.092X_3 + \bar{0}.009X_4 + 0.065X_5 + 0.005X_6 + \bar{0}.000X_7 + \bar{0}.082X_8 + 0.349X_9 + 0.193X_{10} + 0.219X_{11} + \bar{0}.041X_{12} +$$

The variation in adoption of demonstrated practices explained by the set of 12 independent variables was 37.76 percent which was found to be non-significant.

A further more clear picture of the relationship of the significant variables with the farmer-demonstrators'

Table 8(a). Partial regression coefficients for the level of adoption of the farmer-demonstrators and the independent variables. (n = 46)

Variable No.	Variables	Partial regression coefficient (b)	SE of 'b'	't' value	Standardised 'b'
X_1	Age	0.0207	0.019	1.109^{NS}	0.1795
X_2	Socio-economic status	0.0124	0.012	1.053^{NS}	0.2362
X_3	Mass media participation	-0.0919	0.115	-0.800^{NS}	-0.1583
X_4	Cosmopoliteness	-0.0097	0.146	-0.066^{NS}	-0.0109
X_5	Extension orientation	0.0649	0.104	0.627^{NS}	0.1155
X_6	Crop yield index	0.0047	0.007	0.634^{NS}	0.1379
X_7	Economic performance index	-0.0005	0.001	-0.442^{NS}	-0.1014
X_8	Scientific orientation	-0.0820	0.123	-0.666^{NS}	-0.1286
X_9	Management orientation	0.3491	0.183	1.908^{NS}	0.4816
X_{10}	Rationality in decision-making	0.1928	0.283	0.680^{NS}	0.1168
X_{11}	Innovation-proneness	0.2188	0.323	0.677^{NS}	0.1245
X_{12}	Communication skill	-0.0410	0.073	-0.561^{NS}	-0.1116

$R^2 = 0.3776$ $F = 1.669^{NS}$ NS = Not significant

adoption of the demonstrated practices could be had from the data in Table 8(b).

The variables included in the final step of the step-wise regression analysis were X_5, X_9 and X_8, Which explained 29.96 percent of the variation. The final regression equation with all these three variables included was significant in prediction as indicated by the 'F' value.

The final regression equation is given below:

$$Y_3 = 13.1751 + 0.2973^{*}X_9 + 0.2368^{*}X_5 + \bar{0}.1469X_8 +$$

The partial regression coefficients indicated that a unit increase in extension orientation of the farmer-demonstrators resulted in an increase of 0.2368 unit of their adoption level. With a unit increase in management orientation, their adoption of the demonstrated cultivation practices increased by 0.2973 unit.

The influence of the set of selected independent variables on the adoption of the neighbouring farmers is indicated in Tables 8(c) and 8(d).

A perusal of the data in Table 8(c) reveals that the 11 independent variables together explained 34.12 percent of variation in the dependent variable.

Table 8(b). Results of the step-wise regression analysis showing the final step with all significant variables included in the study of the level of adoption of demonstrated practices by the farmer-demonstrators. (n = 46)

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_5	Extension orientation	0.2368	0.0917	2.5815*	0.3818
X_9	Management orientation	0.2973	0.1221	2.4349*	0.4126
X_8	Scientific orientation	-0.1469	0.1004	-1.4625NS	-0.2315

$\bar{R}^2 = 0.2996$ $F = 7.4165^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

Table 8(c). Partial regression coefficients for level of adoption of the neighbouring farmers and the independent variables. (n = 100)

Variable number	Variables	Partial regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_1	Age	-0.0060	0.011	-0.546^{NS}	0.4996
X_2	Socio-economic status	0.0071	0.013	0.550^{NS}	0.0632
X_3	Mass media participation	0.0095	0.052	0.184^{NS}	0.0172
X_4	Cosmopoliteness	-0.1085	0.093	-1.168^{NS}	-0.1294
X_5	Extension orientation	0.1764	0.068	2.583^{*}	0.2810
X_6	Crop yield index	0.0090	0.005	1.940^{NS}	0.1875
X_7	Economic performance index	-0.0004	0.001	-0.594^{NS}	-0.0517
X_8	Scientific orientation	0.1764	0.054	3.241^{**}	0.3351
X_9	Management orientation	0.0010	0.095	-0.011^{NS}	-0.1660
X_{10}	Rationality in decision-making	0.1742	0.119	1.463^{NS}	0.1660
X_{11}	Innovation-proneness	-0.0545	0.159	-0.343^{NS}	-0.0374

$R^2 = 0.3412$ $F = 4.144^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

Table 8(d). Result of the step-wise regression analysis showing the final significant step with all the significant variables included in the study of the level of adoption of the demonstrated practices by the neighbouring farmers. (n = 100)

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_8	Scientific orientation	0.1766	0.0453	3.8964**	0.3353
X_5	Extension orientation	0.1829	0.0537	3.3862**	0.2893
X_6	Crop yield index	0.0120	0.0041	2.9043**	0.2489

$\bar{R}^2 = 0.2867$ $F = 14.2659^{**}$ ** Significant at 1% level of probability

The results of step-wise regression analysis as presented in Table 8(d) indicated that three variables, viz. scientification orientation, extension orientation and crop yield index together explained 28.67 percent variation with the F value being highly significant (F = 14.2659). These variables also showed significant regression coefficients.

The final regression equation given below was significant in predicting the adoption level of the neighbouring farmers.

$$Y_3 = 1.4678 + 0.1766^{**}X_8 + 0.1819^{**}X_5 + 0.0120^{**}X_6 +$$

Hence, the hypothesis that there would be no significant contribution of the set of selected independent variables in the variations in the adoption of the demonstrated cultivation practices was accepted in the case of the farmer-demonstrators and rejected in the case of the neighbouring farmers.

2.4. Relationship between the respondents' attitude towards National Demonstration Program and the independent variables

The results of the simple correlation analysis showing the correlation between the independent variables and the respondents' attitude towards National Demonstration Program are presented in Table 9.

Table 9. Correlation between the independent variables and attitude of farmers towards National Demonstration Program.

Variable No.	Name of the variable	Correlation coefficient 'r'	
		Farmer-demonstrators (n = 46)	Neighbouring farmers (n = 100)
X_1	Age	0.0271^{NS}	-0.0402^{NS}
X_2	Socio-economic status	-0.1555^{NS}	0.0959^{NS}
X_3	Mass media participation	-0.0894^{NS}	0.0898^{NS}
X_4	Cosmopoliteness	-0.0298^{NS}	0.3330^{**}
X_5	Extension orientation	0.2098^{NS}	0.1861^{NS}
X_6	Crop yield index	0.1245^{NS}	0.1499^{NS}
X_7	Economic performance index	0.0923^{NS}	-0.0300^{NS}
X_8	Scientific orientation	0.4156^{**}	0.3360^{**}
X_9	Management orientation	0.3690^{*}	0.3864^{**}
X_{10}	Rationality in decision-making	0.0027^{NS}	0.2559^{*}
X_{11}	Innovation-proneness	0.2143^{NS}	0.2151^{*}
X_{12}	Communication skill	0.0634^{NS}	

* Significant at 5 percent level of probability

** Significant at 1 percent level of probability

NS Not significant

Age was found to have non-significant association with the farmers' attitude towards the National Demonstration Program, with a slight negative tendency in the case of the neighbouring farmers. The non-significance may be explained that whether young or old, farmers will try to search for and participate in various extension education programs whenever they get an opportunity and gather correct details of the program and develop favourable attitudes. In the National Demonstration Program, farmers belonging to various age groups were selected as farmer-demonstrators. They all had obtained high scores for their attitude towards the program, and hence age had non-significant influence in the dependent variable.

The negative tendency found in the case of the neighbouring farmers may be because that young people showed more interest in the Demonstration Program. However, the relationship was not significant.

From Table 9, it was clear that the socio-economic status of the farmer-demonstrators influenced negatively but non-significantly their attitude towards the National Demonstration Program. As the farmers attained higher and higher socio-economic status they might have gradually turned a deaf ear to the various agricultural development

programs and extension education activities due to complacency. The high score, which the farmer-demonstrators attained for their attitude towards the National Demonstration Program may be because they were selected exclusively for the purpose and were provided with all the facilities for the conduct of the demonstrations.

Mass media participation was non-significantly associated with the farmers' attitude towards the Program with a negative trend in the case of the farmer-demonstrators. Mass media might not have provided information on the successful conduct of extension education programs to the farmers, and hence their participation in these information sources did not help in developing favourable attitude towards the Program. The high score that the farmer-demonstrators obtained for the dependent variable might be attributed to the efficient execution of the Program itself.

Table 9 indicated that cosmopoliteness of the farmer-demonstrators had negative but non-significant relationship with their attitude towards the National Demonstration Program. The non-significant relationship itself epitomises the waning influence of the variable 'cosmopoliteness' in determining the various behaviourable dimensions of the farmer-demonstrators. This could also reflect the importance

that the farmer-demonstrators accord to the National Demonstrations.

The positive and significant relationship between these two variables as evidenced in the case of the neighbouring farmers could be attributed to the neighbouring farmers' dependence on cosmopolitan sources of farm information.

Extension orientation had positive but non-significant association with the attitude of both categories of farmers towards National Demonstration Program. Contacts with extension agencies and involvement in extension activities help a farmer to know the procedures and steps to be followed in a good extension education program for the maximum achievement intended. Here, though the farmers were sufficiently oriented to various extension activities, the non-significant influence of this variable in the dependent variable could be attributed to the emergence of other variables which had direct influence in the attitude of the farmers.

Crop yield index also showed a similar relationship with the farmers' attitude towards the program. Farmers whose crop yield level was decreasing, might have taken more interest in taking part in the National Demonstration

Program and thereby developing favourable attitude towards the program. For these farmers, as their per acre yield of crops increased, it served as an incentive for future involvement in the extension education programs and scientific agriculture. This might have led to the development of favourable attitude towards the National Demonstration Program. However, in the absence of statistical significance no conclusion could be arrived at in this respect.

It was observed from Table 9 that economic performance index had no significant influence in changing the attitude of the farmer-demonstrators towards National Demonstration Program. But it showed negative but non-significant association with the dependent variable in the case of the neighbouring farmers.

The lack of any significant relationship between these two variables in the case of the farmer-demonstrators could be related to the overwhelming influence of the National Demonstrations on the attitude of the farmer-demonstrators, who were more involved in the Program than anybody else. Probably, the success of these demonstrations itself would have enabled the farmer-demonstrators to develop favourable attitudes towards the Program thereby minimising the influence of other variables such as economic

performance. But, the case of the neighbouring farmers was quite different in that when their economic performance index was lower, their chances of taking fascination at innovative programs like the National Demonstration Program were higher. When the farmers are on the look-out for new and improved agricultural technologies to improve their own farm income and when they come across the successful National Demonstrations, they are more likely to develop favourable attitudes towards the Program as has been observed in the present study. Here again, the absence of any statistical significance precludes any conclusion.

Scientific orientation was positively and significantly related to the attitude of the farmer-demonstrators and the neighbouring farmers towards National Demonstration Program. Scientifically oriented farmers get involved in extension education programs. They will critically analyse the effectiveness of the programs, the superiority of the practices taught there, the way the farmers are treated, selection of site, the expertise of the agency in the subject matter etc., etc. Their favourable evaluation led to the development of desirable attitude towards the Program among them.

Management orientation was also positively and

significantly related to the farmer-demonstrators' and the neighbouring farmers' attitude towards National Demonstration Program. Farmers who make good management decisions evaluate the programs from various angles and develop favourable or unfavourable attitude towards it. The farmers who had high score for the independent variable might have evaluated the demonstration program positively and developed favourable attitudes. This could probably the reason for the positive and significant relationship between these two affective components of farmers' behaviour.

Rationality in decision-making, as shown in Table 9 was non-significantly associated with the farmer-demonstrators' attitude towards the Program. But it was significantly positive in the case of the neighbouring farmers. Lack of significant variability in the scores of the farmer-demonstrators for 'rationality in decision-making' could be one reason why there was no significant relationship between these two variables in the former case. The other reason, as outlined elsewhere, could be the pervasive influence the National Demonstration Program itself might have had in orienting the attitude of the farmers towards the Program favourably and in that process nullifying the effect of other variables on the attitude.

The neighbouring farmers, though couldn't involve much in the demonstrations, were rational enough to think into the utility of the scientific crop production which led them to its adoption. The superiority of these practices and its profitability over the traditional methods, might have helped them to develop favourable attitude towards the National Demonstration Program in which practical application of the improved practices were demonstrated.

Innovation-proneness exhibited positive but non-significant relationship with the attitude of farmer-demonstrators towards the National Demonstration Program. It had positive and significant association with that of the neighbouring farmers as illustrated in Table 9. The farmer-demonstrators are considered as the front-line farmers since they are innovative, risk-prone and are with the right bent of mind to view programs like the National Demonstrations in the proper perspective. Their basic innovation-prone nature supplemented with the gainful experience in the National Demonstration Program might have helped a great deal in shaping their attitudes towards the National Demonstration Program favourably. But this influence was not significant. Those neighbouring farmers who were more innovative took special interest in participating in the Program thereby developing favourable attitude towards

it, as was observed in the study.

There was no significant relationship between communication skill of the farmer-demonstrators and their attitude towards National Demonstration Program as illustrated in Table 9. The attitude-skill discrepancy, as theorised by Fishbein (1973) could be related here. While communication skill refers to a person's perceived deftness in handling communication situations, his attitude towards a program reflects the strength of his positive or negative affect attached to the program. The glaring dissimilarity between these two variables-with the former relating to conative dimension and the latter to affective dimension-could be brought to focus to explain the reason for the lack of any significant relationship between these two variables.

The results of multiple regression analysis and step-wise regression analysis for attitude of the farmer-demonstrators towards the National Demonstration Program are presented in Tables 9(a) and 9(b), respectively.

The data in Table 9(a) indicate that only 38.39 percent of the variation in the dependent variable was explained by the 12 independent variables taken together ($R^2 = 0.3839$).

Table 9(a). Partial regression coefficients for attitude of the farmer-demonstrators towards the National Demonstration Program and the independent variables (n = 46)

Variable No.	Variables	Partial regression coefficients 'b'	SE of 'b'	't' value	Standardised 'b'
X_1	Age	0.0623	0.051	1.231^{NS}	0.1994
X_2	Socio-economic status	-0.0482	0.032	-1.517^{NS}	0.3390
X_3	Mass media participation	-0.2134	0.311	-0.686^{NS}	0.1357
X_4	Cosmopoliteness	-0.1803	0.394	-0.458^{NS}	0.0748
X_5	Extension orientation	0.1255	0.280	0.448^{NS}	0.0825
X_6	Crop yield index	-0.0054	0.020	-0.270^{NS}	0.0585
X_7	Economic performance index	0.0016	0.003	0.538^{NS}	0.1198
X_8	Scientific orientation	0.4676	0.333	1.404^{NS}	0.2709
X_9	Management orientation	0.7492	0.495	1.513^{NS}	0.3816
X_{10}	Rationality in decision-making	-0.7202	0.767	-0.939^{NS}	0.1611
X_{11}	Innovation-proneness	0.9430	0.874	1.078^{NS}	0.1982
X_{12}	Communication skill	-0.0806	0.198	-0.408^{NS}	0.0810

$R^2 = 0.3839$ $F = 1.713^{NS}$ NS - Not significant

Table 9(b). Results of the step-wise regression analysis showing the final significant step with all significant variables included in the study of the attitude of the farmer-demonstrators towards the National Demonstration Program (n = 46)

Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_8	Scientific orientation	0.7800	0.2252	3.4630**	0.4520
X_2	Socio-economic status	-0.0464	0.0196	-2.3603*	-0.3259
X_{11}	Innovation-proneness	1.4243	0.6508	2.1885*	0.2988

$\bar{R}^2 = 0.2528$ $F = 6.0739^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

This variation was proved as non-significant by the 'F' value.

The multiple regression equation is,

$$Y_4 = 16.025 + 0.062X_1 + \bar{}0.048X_2 + \bar{}0.213X_3 + \bar{}0.180X_4 + 0.126X_5 + \bar{}0.005X_6 + 0.002X_7 + 0.468X_8 + 0.749X_9 + \bar{}0.720X_{10} + 0.943X_{11} + \bar{}0.081X_{12} +$$

The final regression equation, in the prediction of the dependent variable is,

$$Y_4 = 0.5692 + 0.7800^{**}X_8 + \bar{}0.0464^{*}X_2 + 1.4243^{*}X_{11} +$$

The final result evidenced that 25.28 percent of the variation in the dependent variable was explained by the variables X_8, X_2 and X_{11}. Other factors being kept constant, a unit increase in scientific orientation would result in an increase of 0.78 unit in the dependent variable. Similarity, an increase of 1.4243 unit and a decrease of 0.0464 unit in the dependent variable was brought about by a unit increases in innovation-proneness and socio-economic status, respectively.

Table 9(c) furnishes an overall picture of the nature of relationship between the dependent variable and

the selected independent variables in the case of the neighbouring farmers.

The coefficient of determination (R^2) indicated that the variation in the dependent variable explained by the 11 variables taken together was significant (31.01 percent).

A clear idea of the variables which significantly influence the neighbouring farmers' attitude towards the National Demonstration Program could be had from Table 9(d). The step-wise regression included six independent variables in the final significant step. They were variables X_9, X_8, X_4, X_6, X_7 and X_2 which explained 25.81 percent of the variation. The first four of these showed significant positive association with the dependent variable.

The final regression equation predicting the neighbouring farmers' attitude towards National Demonstration Program is given below.

$$Y_4 = 10.0241 + 0.8130^{**}X_4 + 0.6605^{*}X_9 + -0.0777^{*}X_2 + 0.3188^{*}X_8 + -0.0045^{*}X_7 + 0.0255^{*}X_6 +$$

Based on the above results observed, the hypothesis test there would be no significant variation in the farmers'

Table 9(c). Partial regression coefficients for the attitude of the neighbouring farmers towards the National Demonstration Program (n = 100)

Variable No.	Variables	Partial regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_1	Age	-0.0101	0.032	-0.314^{NS}	0.0294
X_2	Socio-economic status	-0.0792	0.038	-2.111^{*}	-0.2472
X_3	Mass media participation	-0.0731	0.150	-0.486^{NS}	0.0464
X_4	Cosmopoliteness	0.7805	0.271	2.880^{**}	0.3264
X_5	Extension orientation	0.0814	0.199	0.408^{NS}	0.0454
X_6	Crop yield index	0.0239	0.014	1.752^{NS}	0.1745
X_7	Economic performance index	-0.0048	0.002	-2.227^{*}	-0.2178
X_8	Scientific orientation	0.3157	0.159	1.988^{*}	0.2102
X_9	Management orientation	0.6045	0.277	2.183^{*}	0.2556
X_{10}	Rationality in decision-making	0.1771	0.347	0.510^{NS}	0.0591
X_{11}	Innovation-proneness	0.0489	0.463	0.106^{NS}	0.0117

$R^2 = 0.3101$ $F = 3.596^{**}$

* Significant at 5% level of probability

** Significant at 1% level of probability

NS Not significant

Table 9(d). Result of the step-wise regression analysis showing the final significant step with all the significant variables included in the study of the attitude of the neighbouring farmers towards the National Demonstration Program (n = 100)

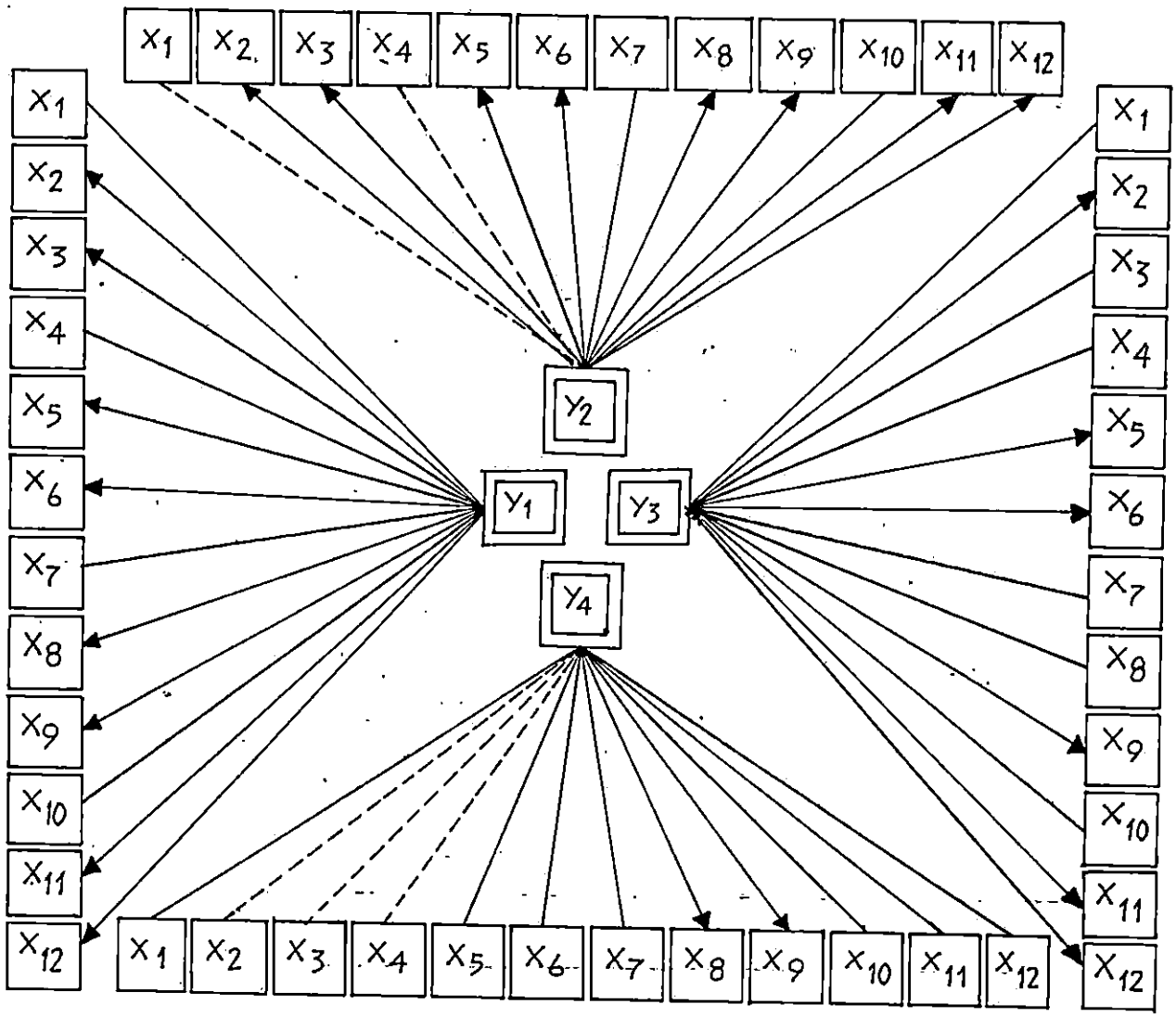
Variable number	Name of the variable	Regression coefficient 'b'	SE of 'b'	't' value	Standardised 'b'
X_9	Management orientation	0.6605	0.2591	2.5492*	0.2789
X_8	Scientific orientation	0.3188	0.1441	2.2123*	0.2123
X_6	Crop yield index	0.0255	0.0127	2.0078*	0.1859
X_7	Economic performance index	-0.0045	0.0020	-20.2500*	-0.2043
X_4	Cosmopoliteness	0.8130	0.2517	3.2300**	0.3400
X_2	Socio-economic status	-0.0777	0.0344	-2.2587*	-0.2426

$\bar{R}^2 = 0.2581$ $F = 6.7394^{**}$

** Significant at 0.01 level of probability

* Significant at 0.05 level of probability

FIG. 7- PARADIGM SHOWING THE RELATIONSHIP OF INDEPENDENT VARIABLES WITH DEPENDENT VARIABLES OF FARMER-DEMONSTRATORS



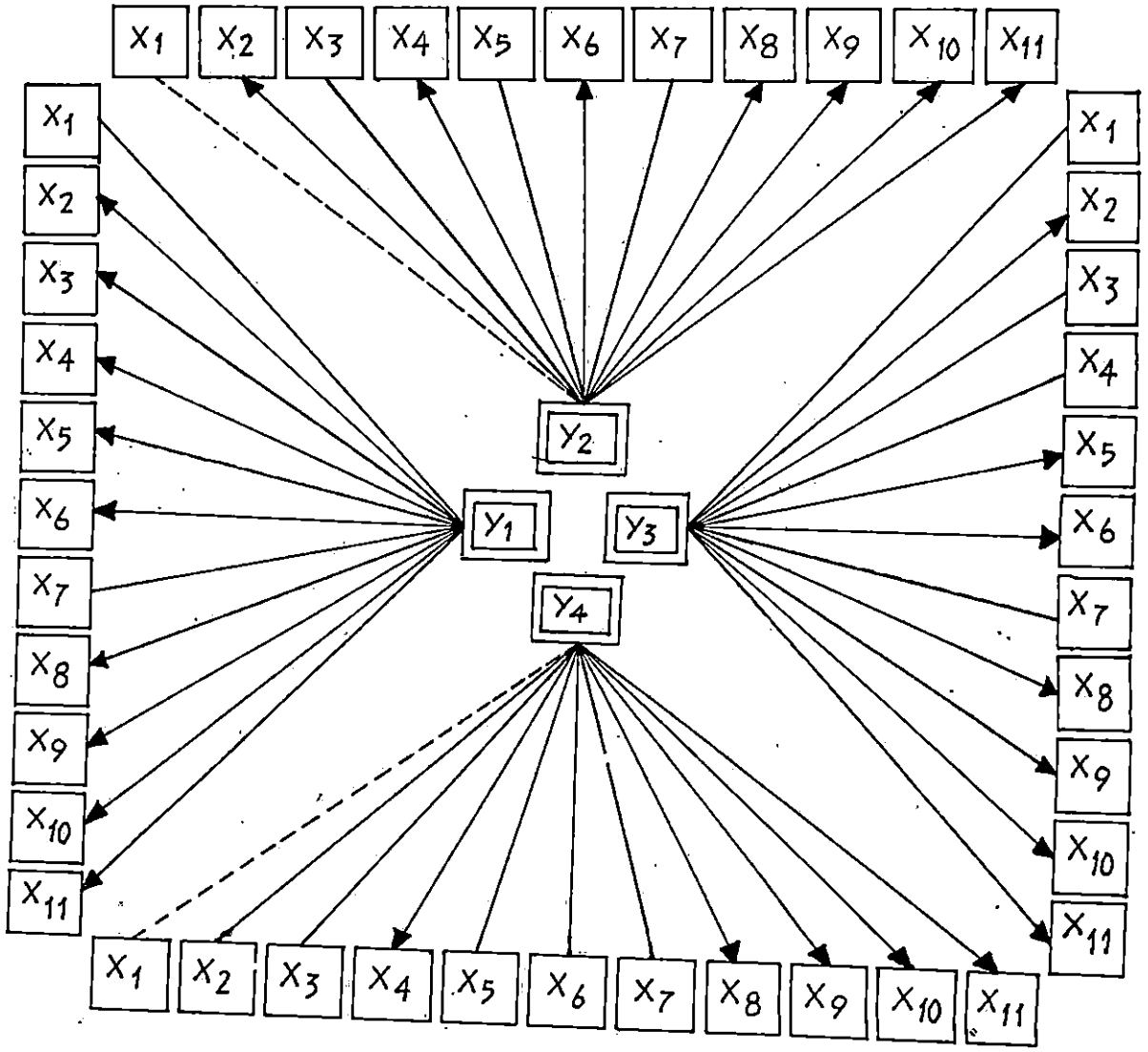
INDEX

- X_1 AGE
- X_2 SOCIO ECONOMIC STATUS
- X_3 MASS MEDIA PARTICIPATION
- X_4 COSMOPOLITENESS
- X_5 EXTENSION ORIENTATION
- X_6 CROP YIELD INDEX
- X_7 ECONOMIC PERFORMANCE INDEX
- X_8 SCIENTIFIC ORIENTATION
- X_9 MANAGEMENT ORIENTATION
- X_{10} RATIONALITY IN DECISION-MAKING
- X_{11} INNOVATION-PRONENESS
- X_{12} COMMUNICATION SKILL

- DEPENDENT VARIABLE
- INDEPENDENT VARIABLE
- ——→ POSITIVE SIGNIFICANT RELATIONSHIP
- —— POSITIVE NONSIGNIFICANT RELATIONSHIP
- - - - - NEGATIVE NONSIGNIFICANT RELATIONSHIP

- Y_1 KNOWLEDGE
- Y_2 ATTITUDE
- Y_3 ADOPTION
- Y_4 ATTITUDE TOWARDS NATIONAL DEMONSTRATION PROGRAM

FIG. 8 - PARADIGM SHOWING THE RELATIONSHIP OF INDEPENDENT VARIABLES WITH DEPENDENT VARIABLES OF NEIGHBOURING FARMERS



INDEX

- X_1 AGE
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- X_5 EXTENTION ORIENTATION
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- X_7 ECONOMIC PERFORMANCE INDEX
- X_8 SCIENTIFIC ORIENTATION
- X_9 MANAGEMENT ORIENTATION
- X_{10} RATIONALITY IN DECISION-MAKING
- X_{11} INNOVATION - PRONENESS

DEPENDENT VARIABLE

INDEPENDENT VARIABLE

→ POSITIVE SIGNIFICANT RELATIONSHIP.

—— POSITIVE NONSIGNIFICANT RELATIONSHIP

---- NEGATIVE NONSIGNIFICANT RELATIONSHIP

- Y_1 KNOWLEDGE
- Y_2 ATTITUDE
- Y_3 ADOPTION
- Y_4 ATTITUDE TOWARDS NATIONAL DEMONSTRATION PROGRAM

attitude towards the National Demonstration Program contributed by the set of selected independent variables was accepted in the case of the farmer-demonstrators and rejec in the case of the neighbouring farmers.

3. Perception of the farmers about the methodology followe in the conduct of National Demonstrations

Table 10. Mean scores of the respondents on perception about the methodology followed in the conduct of National Demonstrations.

Respondents	Mean perception score	't' value
Farmer-demonstrators (n = 46)	49.10	10.37**
Neighbouring farmers (n = 100)	41.62	

** Significant at 1% level of probability

Results in Table 10 point out to the significant difference in the mean perception scores of the farmer-demonstrators and the neighbouring farmers about the methodology followed in the conduct of the National Demonstrations.

Since the farmer-demonstrators themselves were closely involved in the demonstration, they could perceive it better than the neighbouring farmers. Therefore, it was quite natural for them to have higher score in this respect. The result further indicated that the mean score obtained by the farmer-demonstrators (49.10) was only slightly higher than half of the maximum score that could be achieved (80). This leads to the assumption that the methodology followed in the conduct of the demonstration was not appreciated by the farmers to the extent desired.

In the light of the above result, the hypothesis that there would be no significant difference between the two categories of respondents with regard to their perception about the methodology followed in the conduct of National Demonstrations was rejected.

4. Constraints experienced by the farmer-demonstrators in conducting National Demonstrations

The major constraints experienced by the farmer-demonstrators in conducting the National Demonstrations are presented in Table 11. These constraints are ranked based on the severity with which they were felt.

The constraints, 'lack of follow-up', 'trainings

Table 11. Constraints experienced by the farmer-demonstrators in conducting National Demonstrations.

Sl. No.	Constraints	Cumulative index / Frequency of Response	Rank
1	Risk involved in making the demonstration a success	1.108	14
2	Facing the enemity of other farmers	1.021	16.5
3	Lack of interest on the part of other farmers in visiting the demonstration plot	3.695	5
4	Lack of timely guidance and supervision	1.065	15
5	Inadequate trainings given	3.97	4
6	Involvement of inexperienced scientists	1.30	10
7	Lack of follow-up	4.00	2.
8	No provision for feedback	1.26	12
9	Trainings conducted were not based on the farmers' need	4.00	2.
10	The seminars conducted were not based on the farmers' need	3.56	6
11	Field days conducted were not appropriate	4.00	2.
12	Inadequate supply of inputs	3.108	7
13	Untimely supply of inputs	1.239	13
14	Lack of technical know-how	1.52	9
15	Incompatibility of recommendations	1.021	16.5
16	Unavailability of plant protection equipment	2.97	8
17	No help from other agencies	1.28	11

conducted were not based on farmers' need' and 'field days conducted were not appropriate' were pointed out to be the most felt ones. The next rank was given to 'inadequate trainings given' and the fifth rank to 'lack of interest on the part of other farmers in visiting the demonstration plot'. The ranks given to the other constraints are shown in the Table.

Follow-up, which is a major element in any extension and development program was perhaps not at all given any importance in the National Demonstration Program conducted during the period under study as is evident from the results. Follow-up is also a vital element to ensure sustained adoption of the improved practices. Either the scientists-in-charge or the field level workers were unaware of its importance and need. This could also be attributed to the inadequate staff attached to the program.

The training programs conducted, though in limited numbers, were not based on the farmers' needs. This could be attributed to the lack of proper planning in scheming training programs. This may also reflect in the inadequacy of training programs for the Project staff.

Field days were not conducted at any of the demonstration areas. The reason given for this was that the

field days were conducted along with the seminars conducted at the headquarters once in an year. The scientists were probably not exposed to the extension education techniques of organising such field days.

Trainings, which are meant to change the skill of the farmers in their farm practices were not adequately organised as perceived by the farmer-demonstrators. The non-filling of the post of subject matter specialist for conducting trainings for the farmers might have contributed to this inadequacy.

Even with all the staff and their commitment in the program, their toils will be ineffective if the neighbouring farmers have no interest in participating in the demonstrations and visiting the demonstration plot. This was one of the major constraints experienced by the farmer-demonstrators.

The next major constraint as expressed by the farmer-demonstrators was that the seminars conducted were not based on cultivators' needs. This points out to the general nature of agricultural seminars conducted in the area wherein almost all important crops and enterprises are discussed without any particular reference to any crop.

The inputs supplied were perceived to be inadequate

by the farmer-demonstrators. This oft-repeated grievance cannot but be addressed to by the Indian Council of Agricultural Research which funds the Program.

'Lack of technical know-how' was found assigned the next rank in the constraint-hierarchy. The lack of organised attempts on the part of the implementing agency to provide technical back-stop to the farmers and the Program might be the reason for this. Majority of the farmer-demonstrators opined that failure in these demonstrations was due to the involvement of inexperienced scientists. Whenever programs which require experienced hands for their implementation are initiated, the University ought to have made it mandatory to post only senior scientists in such programs. This lack of insistence could be attributed to this phenomenon.

The other major constraints, in the order of their importance were, 'no help from other agencies', 'no provision for feed back', 'untimely supply of inputs', 'risk involved in making the demonstration a success', 'lack of timely guidance and supervision', 'facing the enemity of other farmers' and 'incompatibility of recommendations', which, of course, were assigned only lower ranks in the constraint-hierarchy by the farmer-demonstrators. These

constraints unequivocally point out to the need for co-ordinated efforts by all concerned, to make the program more meaningful and effective.

SUMMARY AND CONCLUSION

V SUMMARY AND CONCLUSION

The National Demonstration Program was launched in India in 1966-67 with the purpose of popularising the high yielding varieties of paddy and bringing the scientists in direct contact with farmers. Since 1974-75, the Kerala Agricultural University has been implementing the Program. The Program, initially implemented in Trichur district, was shifted to Quilon district in 1983. So far, no systematic study has been conducted to assess the impact of the National Demonstration Program in Quilon district. Hence, the present study was undertaken with the following objectives.

1. To ascertain the effectiveness of National Demonstrations in the knowledge about, attitude towards and adoption of the demonstrated practices by the farmer-demonstrators and the neighbouring farmers in Quilon district.

2. To study the attitude of the farmer-demonstrators and the neighbouring farmers towards the National Demonstration Program.

3. To find out the perception of the farmer-demonstrators and the neighbouring farmers about the methodology followed in the conduct of National Demonstrations.

4. To analyse the constraints, if any, experienced by the farmer-demonstrators in conducting National Demonstrations.

The study was conducted in 1986-87 in Quilon district where 46 demonstrations spread over 14 villages were conducted on paddy cultivation. All these 46 farmer-demonstrators and 100 randomly selected neighbouring farmers growing paddy, formed the sample for the study.

Five demonstrated cultivation practices were selected for the study viz. use of high yielding varieties of paddy, soil testing, liming, use of chemical fertilizers and use of plant protection chemicals.

The dependent variables used in this study were, knowledge about, attitude towards and adoption of the demonstrated practices and attitude towards National Demonstration Program. Age, Socio-economic status, mass media participation, cosmopoliteness, extension orientation, crop yield index, economic performance index,

scientific orientation, management orientation, rationality in decision-making, innovation-proneness and communication skill formed the 12 independent variables.

The level of knowledge on the demonstrated cultivation practices was measured with the help of the method developed by Nair (1969) and used by Kamarudeen (1981). Attitude towards the practices was measured using the scale developed by Kamarudeen (1981) based on the method of summated rating suggested by Likert (1932), and the extent of adoption of the demonstrated practices by the procedure developed by Supe (1969). Attitude of the farmers towards National Demonstration Program was measured using a scale developed in the study. Perception and constraints were measured using arbitrary scales developed for the purpose.

The independent variables were quantified based on established procedures.

The data were collected by personal interviews with the respondents, using a structured and pre-tested schedule. Analysis of the data was done using 't' test and 't' test using Cochran's approximation, simple correlation, multiple regression and step-wise regression methods.

Null hypotheses were set for the study and their validity tested. The major findings of the study are as follows:

1. There was significant difference between the farmer-demonstrators and the neighbouring farmers with respect to their knowledge about, attitude towards and adoption of the demonstrated cultivation practices, and their attitude towards National Demonstration Program.

2. Socio-economic status, mass media participation, extension orientation, crop yield index, scientific orientation, management orientation, innovation-proneness and communication skill had positive and significant relationship with the level of knowledge of the farmer-demonstrators.

In the case of the neighbouring farmers, socio-economic status, mass media participation, cosmopoliteness, extension orientation, crop yield index, scientific orientation, management orientation, rationality in decision-making and innovation-proneness showed positive and significant correlation with their level of knowledge.

3. As a set, the selected independent variables contributed significant variation in the level of knowledge

of the farmer-demonstrators and the neighbouring farmers. In the case of the farmer-demonstrators, crop yield index, scientific orientation and communication skill contributed the maximum variation, while rationality in decision-making, extension orientation, innovation-proneness and socio-economic status contributed the maximum in the case of the neighbouring farmers.

4. Socio-economic status, mass media participation, extension orientation, crop yield index, scientific orientation, management orientation, innovation-proneness and communication skill were found to have positive and significant relationship with the attitude of the farmer-demonstrators towards the demonstrated practices. In the case of the neighbouring farmers, socio-economic status, cosmopoliteness, crop yield index, scientific orientation, management orientation, rationality in decision-making and innovation-proneness showed positive and significant association with their attitude towards the demonstrated practices.

5. The twelve independent variables together indicated significant contribution in the variation in the attitude of the farmers towards the demonstrated cultivation practices of paddy. Of these, the variables, management orientation, scientific orientation, cosmopoliteness

and socio-economic status together contributed the maximum in the case of the farmer-demonstrators. In the case of the neighbouring farmers, the maximum variation was contributed by management orientation, scientific orientation, rationality in decision-making and cosmopoliteness acting together.

6. Positive and significant correlation was observed between socio-economic status, extension orientation, crop yield index, management orientation, innovation-proneness and communication skill of the farmer-demonstrators and their level of adoption. Socio-economic status, extension orientation, crop yield index, scientific orientation, management orientation, rationality in decision-making and innovation-proneness had positive and significant influence on their level of adoption in the case of the neighbouring farmers.

7. The contribution made by the selected independent variables together in influencing the adoption behaviour of the farmer-demonstrators was not significant, while it was significant in the case of the neighbouring farmers. The maximum contribution in the variation was by extension orientation, management orientation and scientific orientation in the case of the farmer-demonstrators and scientific orientation, extension orientation and crop yield

index in the case of the neighbouring farmers.

8. The independent variables, scientific orientation and management orientation alone showed positive and significant influence on the farmer-demonstrators' attitude towards National Demonstration Program. In the case of the neighbouring farmers, their cosmopoliteness, scientific orientation, management orientation, rationality in decision-making and innovation-proneness showed positive and significant correlation with their attitude towards the Program.

9. The independent variables together contributed non-significant variation in the attitude of the farmer-demonstrators towards National Demonstration Program, of which scientific orientation, socio-economic status and innovation-proneness were found to influence the maximum. In the case of the neighbouring farmers, the variation caused by the independent variables together was significant, and six variables viz., cosmopoliteness, management orientation, scientific orientation, crop yield index, economic performance index and socio-economic status contributed the maximum.

10. There was significant difference between the farmer-demonstrators and the neighbouring farmers in their

perception about the methodology followed in the conduct of National Demonstrations.

11. The results of constraint analysis indicated the need for periodical follow-up of the program, need-based and adequate trainings and proper field days.

The study conclusively proved that the National Demonstrations conducted in Quilon district were effective in changing the knowledge, attitude and adoption of the demonstrated practices by the farmer-demonstrators and their attitude towards the program. It also implies that the Program could not achieve the end of reaching out to the neighbouring farmers to the desired extent.

The methodology followed in the conduct of the program was poor in general as perceived by the farmers. The mean perception score was only 50 percent of the total score possible. This indicates that those scientists and other staff involved in implementing the National Demonstration Program should see that these Demonstrations are conducted in a systematic and efficient way. The results of the constraint analysis also point out to the need for further improvement in the conduct of the program. Regular follow-up among the farmers in the demonstrated areas needs much emphasis. The objective of bringing the

scientists in direct contact with the farmers and their fields was met to a very less extent, and hence, need-based trainings and seminars could not be conducted to the desired extent. Well trained and experienced senior scientists must be entrusted with the responsibility of conducting the National Demonstrations. It is also recommended that adequate publicity through important mass media should be given during the different stages of the demonstrations. A reorientation of the National Demonstration Program on the above lines will help the program reach its cherished goals.

REFERENCES

VI REFERENCES

Ahamed, P. 1981. Effectiveness of the Training Programmes for farmers. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani.

*Allport, G. 1935. A handbook of Social Psychology. Mirickson, G. (Eds.) Clark University Press, Lorcestor.

Anasthasi, A. 1961. Psychological Testing. McMillan and Company, New York.

Aristotle, D. 1981. Impact of Village Adoption Scheme of a Nationalised Bank. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Balar, N.H. and Patel, I.C. 1973. Evaluation of the National Demonstration Programme in Gujarat State. Indian J. Extn. Edn. 9(1 & 2): 27-37.

Balasubramanian, B. 1977. A study on selected Psychological Correlates for Adoption of Improved Practices in Ragi. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Balasubramanian, R. 1980. Adoption of Dairy Innovations - A Critical Analysis. M.Sc.(Ag.) Thesis (unpubl.). Centre for Agricultural and Rural Development Studies, T.N.A.U., Coimbatore.

Balasubramaniam, R. 1985. Spread and Acceptance of Pulses Technology. M.Sc.(Ag.) Thesis (unpubl.). Centre for Agricultural and Rural Development Studies, T.N.A.U., Coimbatore.

Balasubramaniam, S. and Kaul, P.N. 1985. Adoption of Improved Practices by Traditional Fishermen in Kerala. Indian J. Extn. Edn. 21(3 & 4): 80-88.

Balu, S.R.A. 1980. A study on the Functioning of Integrated Dryland Agricultural Development Project. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Barewar, R.G. 1957. A study of Agricultural Development in Relation to Extension Methods. M.Sc.(Ag.) Thesis (unpubl.). I.A.R.I., New Delhi.

Bawajir, S.M. and Nandapurkar, G.G. 1985. Development and Standardisation of the Socio-economic Status Scale to measure the SES of the farmers. Maha. J. Extn. Edn. 4: 89-97.

Beal, G.M. and Rogers, E.M. 1960. The Adoption of Two Farm Practices in a Central Iowa Community. Special Report. 26, Iowa State University of Science and Technology, Iowa.

Behera, C. and Sahoo, M.S. 1975. Impact of National Demonstration on Adoption of Agricultural Practices. Indian J. Extn. Edn. 11(1 & 2): 32-35.

Belcher, John, C. 1951. Evaluation and Restandardisation of Sewell's Socio-Economic Status Scale. Rural Sociology. 16: 2.

Berlo, Devid, K. 1960. The Process of Communication. Holt, Rinehart and Winston, Inc., New York.

Bhaskaran, C. 1979. A Critical Analysis of the Interpersonal Communication Behaviour of Small and Other farmers in a Less progressive and More progressive village in Kanyakumari district of Tamil Nadu. Ph.D. Thesis (unpubl.). U.A.S., Bangalore.

Bhilegaonkar, M.G. and Dakh, A.M. 1978. A study of Mobile Farm Advisory Service. Indian J. Extn. Edn. 14(1 & 2): 62-63.

Bhoite, H.S. and Nikalji, Y.S. 1983. A study of adoption of Dryland Agricultural Technology with special reference to selected socio-economic attributes. Maha. J. Extn. Edn. 2: 93-97.

Chandrakandan, K. 1982. Effectiveness of Farm Broadcast on Listeners' affective, cognitive and psychomotor behaviour. Ph.D. Thesis (unpubl.). Centre for Agricultural and Rural Development Studies, T.N.A.U., Coimbatore.

*Channegowda, M.B. 1971. A study on the Adoption of Recommended Paddy Practices by Farmers of Mandya district in Mysore State. M.Sc.(Ag.) Thesis (unpubl.). U.A.S., Bangalore.

*Chapin, F.Stuart 1928. Cultural Changes. Century Crofts, New York.

*Chattopadhyay, S.N. 1963. A study of some Psychological Correlates of Adoption of Innovations in Farming. Ph.D. Thesis (unpubl.). I.A.R.I., New Delhi.

Choukidar, V.V. and George, P.S. 1972. Adoption behaviour and Characteristics of farmers. Indian J. Extn. Edn. 8(3 & 4): 40-53.

Cronbach, L.J. 1949. Essentials of Psychological Testing. Harper and Bros., New York.

Deb, P.C., Sharma, M.L. and Nirbhail, S. 1968. Rationality in decision-making in the adoption of improved practices. J. of Res. 6: 125-128.

Draper, Norman and Smith, Harry 1966. Applied Regression Analysis. John Wiley and Sons, Inc., New York.

Duncan, J.A. and Kreltlow, B.N. 1954. Selected Cultural Characteristics and Acceptance of Education Programme and Practices. Rural Sociology. 19: 349-357.

Duraiswami, K. 1981. Integrated Rural Development Programme - A Beneficiary Analysis. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Edwards, A.L. 1957. Techniques of Attitude Scale Construction. Vakils, Feffer and Simons Pvt. Ltd., Bombay.

English, H.B. and English, A.C. 1958. A Comprehensive Dictionary of Psychological and Psycho-Analytical Terms. Longmans Green and Co., New York.

Ensminger, D. and Sanders, I.T. 1945. What Extension is. In Brunner et al. (ed.) Farmers of the World. Oxford University Press, Geoffry Cambridge.

Fishbein, Martin 1973. Introduction. The Prediction of Behaviours from Attitudinal Variables. In Mortensen, David, C. and Sereno, Kenneth K. (eds.) Advances in Communication Research. Harper and Row Publishers, New York.

Fliegel, F.C. 1956. A Multiple Correlation Analysis of Factors Associated with Adoption of Farm Practices. Rural Sociology. 21: 284-295.

Garg, J.S. 1961. Agricultural Extension and Community Development. Educational Press, Agra.

Gaurha, R.S. and Pathak, P.K. 1985. Impact Analyses of National Demonstrations in popularisation of Rice Technology on the Farms of Demonstrating Farmers. Maha. J. Extn. Edn. 4: 155-157.

Gilbertson, H.W. and Gallup, G. 1957. Result Demonstration Manual for Extension Workers. Agricultural Hand Book 123, U.S.D.A.

Godhandapani, G. 1985. Knowledge and Adoption of Nutrient Recommendation for Irrigated Groundnut. Ph.D. Thesis (unpubl.). Centre for Agricultural and Rural Development Studies, T.N.A.U., Coimbatore.

Gould, J. and Kolb, W.L. (eds.) 1964. A Dictionary of the Social Sciences. Tavistock Publications, London.

Grewal, I.S. and Sohal, T.S. 1971. Comparative role of two social systems in the speed of adoption of some farm practices. Indian J. Extn. Edn. 7(1 & 2): 1-6.

chological Methods. Tata McGraw
bay.

er, B. 1978. Fundamental
hology and Education. McGraw
., Tokyo.

dy on the Impact of the Agri-
s Implemented by the Small Farmers
Among Farmers of Trivandrum
g.) Thesis (unpubl.). College of
yani, Trivandrum.

Chitambar, J.B. and Chaubey, B.K.
ational Demonstration on Parti-
ticipant Farmers. Indian J. Extn.
-78.

.K. 1972. Measurement of Progre-
ng. In Studies in Extension Educa
(ed.). NICD, Hyderabad. p 115.

doption of low cost Technology
s. M.Sc.(Ag.) Thesis (unpubl.).
ge and Research Institute, T.N.A.U

traints involved in Certified
on - An Analysis. M.Sc.(Ag.)
Agricultural College and Research
., Coimbatore.

G.S. 1972. Adoption Behaviour
Hybrid Bajra Cultivation. Indian
& 2): 24-31.

). 1972. National Demonstration
ecialists, Extension Personnel
Farmers. Indian J. Extn. Edn.

1, R.K. 1977. Socio-personal
ication Behaviour of Small
ressive and Less Progressive
as Agric. J. 64(11): 756-757.

Transfer of Dryland Technology - nstraint Analysis. M.Sc.(Ag.) Agricultural College and Research U., Coimbatore.

e, G.K. 1984. Analysis of Techno- ibal Farming System. Man in India. llege of Agriculture, Parphani,

Extension Teaching Methods. ation in Community Development. tension, Ministry of Food and . of India, New Delhi.

nique for the Measurement of Psychol. 140.

; of Industrial Co-operative Tea growers. M.Sc.(Ag.) Thesis ultural College and Research .U., Coimbatore.

ocio-Psychological Factors asso- Credit Behaviour of Delhi Farmers. ubl.). I.A.R.I., New Delhi.

3. A Comparative Study of Adoption ltancy Pattern and Information ty of Small, Marginal and Other lore district of Karnataka State. s (unpubl.). U.A.S., Bangalore.

J.A. 1981. Factors associated s' and Non-participants' Attitude d Market. Indian J. Extn. Edn.

study on the Knowledge and Extent unflower Growers. M.Sc. (Ag.) . Agricultural College and Research .U., Coimbatore.

ii

L. 1978. Retention of Knowledge
by Rural Women as related to
ic status. Indian J. Home Scien

A.C. 1955. The Relation of
istics to the Adoption of Reco-
ices. Rural Sociology. 20:

dy of the Predictive Values of
loption of Nitrogenous fertilizer
of Sources of Information on
. Ph.D. Thesis (unpubl.). I.A.R

59. A Multivariate Study on
Yielding Paddy Varieties by the
State. Ph.D. Thesis (unpubl.).
ai.

Critical Analysis of the Functio
one Area Programme. M.Sc.(Ag.)
Agricultural College and Resea
J., Coimbatore.

onality in Decision-Making by
h.D. Thesis (unpubl.). Centre
and Rural Development Studies.
ore.

.P. 1984. Impact of National.
the knowledge and adoption beha-
armers from Dhulia District of
a. J. Extn. Edn. 3: 73-76.

Pal, Singh Saini, S., Shukla, A.N. and Khurana, G.S. 1977. Attributes of Potential Adopters of Recommended Dairy Production Innovations. Indian J. Extn. Edn. 13(3 & 4): 56-58.

Palaniswamy, A. 1978. Adoption Behaviour of Malli and Mullai Flower Growing Farmers. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Pareek, U. and Singh, Y.P. 1966. A Scale for Rating Communication Skill of Farmers. Indian J. Applied Psychol. 3(1): 10-14.

Parshad, R. and Sandhu, A.S. 1974. Communication Skills of Village Level Workers of the Punjab State. Indian J. Extn. Edn. 10(3 & 4): 72-73.

Patel, P.M. and Singh, K.N. 1970. Differential Characteristics of Adopters and Non-adopters of Farm Planning. Indian J. Extn. Edn. 6(1 & 2): 96.

Pathak, S. 1981. A Multiple Regression Analysis of Factors Related with Attitude of Farmers. Indian J. Extn. Edn. 17(3 & 4): 73-80.

Pathak, S., Pal, M.K. and Guha Roy, M.K. 1979. Impact of National Demonstration on Knowledge, Attitude and Adoption Level of Farmers in West Bengal. Indian J. Extn. Edn. 15(1 & 2): 49.

Philip, S. 1984. Study on the Agricultural Information Support provided through Radio to Farmers by KAU. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

Pillai, G.B. 1978. A study on Adoption of Soil Conservation Measures by Farmers in Scheme area of Trivandrum District. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

Ponnappan, C. 1982. Fish Farmers Development Programme: An Analysis. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Prakash, R. 1980. A Study on the Impact of Agricultural Development Programmes among the tribals of Kerala. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

Prasad, R.M. 1983. Comparative Analysis of Achievement Motivation of Rice Growers in three States in India. Ph.D. Thesis (unpubl.). U.A.S., Bangalore.

Radhakrishnamoorthy, D. 1969. Impact of National Demonstration on Farmers - A study in Two Districts of Andhra Pradesh. M.Sc.(Ag.) Thesis (unpubl.). Extension Education Institute, Hyderabad.

Rajendran, P. 1978. A Study of Factors Affecting the Adoption of Selected Agricultural Practices. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

*Ramaiah, K. 1965. Minutes of the Meeting on National Demonstration. I.C.A.R., New Delhi.

Ramalingam, P. 1981. Farm-Service Performance of Regional Rural Bank. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

*Ramalingegowda, B. 1978. A Critical Analysis of the Adoption Behaviour of 'Varalaxmi' Cotton Cultivators in Malaprabha Command Area of Karnataka State. M.Sc.(Ag.) Thesis (unpubl.). U.A.S., Bangalore.

Ramkrishan, 1965. Agricultural Demonstration and Extension Communication. Asia Publishing House, Bombay.

Ramsey, C.H., Polson, R.A. and Spencer, G.H. 1959. Values and Adoption of Practices. Rural Sociology. 24.

Rao, A.G. 1971. Impact of National Demonstration on Farmers of Selected villages in East Godavari District of Andhra Pradesh. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Shilaja, S. 1981. Influence of Leaders in the Development of Rural Areas. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

Singh, B. and Kunzroo. 1985. Attitude of Farmers Towards Goat and Sheep Farming. Indian J. Extn. Edn. 21 (1 & 2): 86-88.

*Singh, B.D. 1968. Diffusion of Information about high yielding varieties and multiple cropping through the medium of National Demonstration. M.Sc.(Ag.) Thesis (unpubl.). I.A.R.I., New Delhi.

Singh, K.M.P. and Singh, R.P. 1974. Impact of National Demonstration in the Adoption of High Yielding Varieties of Wheat. Indian J. Extn. Edn. 10(1 & 2): 65-67.

Singh, R. 1983. Selected Characteristics of Farmers in Relation to their Adoption of Farm Mechanization. Indian J. Extn. Edn. 19(3 & 4): 11-17.

Singh, R.I. and Dikshit, K.N. 1966. Role of Large Scale Demonstration in the Adoption of Innovation in an Action Project. J. Extn. Edn. 2(2): 167-173.

Singh, S.N. and Singh, K.N. 1970. A Multi-variate Analysis of Adoption Behaviour of Farmers. Indian J. Extn. Edn. 6(3 & 4): 39-45.

Singh, T.R. and Singh, S.N. 1982. A Study on Interplay of Belief, Value and Attitude of Farming Couples on Rational and Adoption Behaviour under Differential Innovation Situation. Indian J. Extn. Edn. 18(1 & 2): 73-82.

Sinha, G.P. 1976. Labour Welfare Measure. Mongia, J.N. (ed.) Readings in Indian Labour and Social Welfare. Atma Ram and Sons, Delhi. 324-325.

Sinha, H.S.P., Sinha, A.K. and Sinha, K. 1984. A Study of Attitude of Farmers of Chhotanagpur Towards Soil Conservation Programme. Indian J. Extn. Edn. 20(3 & 4): 9-18.

Sanoria, Y.C. and Sharma, D.K. 1983. Comparative Analysis of Adoption Behaviour of Beneficiaries of Farm Development Programmes. Indian J. Extn. Edn. 19 (1 & 2): 84-86.

Sawant, G.K. and Thorat, S.S. 1977. Rationality of the Farmers in Relation to Adoption of Improved Farm Practices. Indian J. Extn. Edn. 13(3 & 4): 59-60.

Segar, V. 1979. Adoption Behaviour of Members and Non-members of Farmers' Discussion Groups. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Sen, L.K. 1972. Leadership Characteristics and Community-wide adoption of Agricultural Innovation. In Sinha, P.R.R. (ed.). Studies in Extension Education. National Institute of Community Development, Hyderabad.

Senthil, D. 1983. A Critical Analysis of Hybrid Cotton Seed Growers. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

*Shankaraiah, C. and Crouch, B.R.B. 1977. Patterns of adaptation and factors associated with economic success in the wool industry. North West Queensland, Australia.

Shankaraiah, C. and Singh, K.N. 1967. Productive Analysis of Factors Related with knowledge of Improved Practices of Vegetable Cultivation. Indian J. Extn. Edn. 3(1 & 2): 67-73.

*Shanmukhappa, S. 1978. A Study on the Adoption behaviour and Value Orientation of Arecanut Growers of Shimoga District in Karnataka State. M.Sc.(Ag.) Thesis (unpubl.). U.A.S., Bangalore.

Sharma, D.K. 1966. Role of Information Sources and Communication Channels in Adoption of Improved Farm Practices by Farmers in Madhya Pradesh. Indian J. Extn. Edn. 6(3 & 4): 12.

Sinha, H.S.P. and Sinha, S.K. 1980. Adoption of High Yielding Varieties of Maize by the Farmers of Sikkim. Indian J. Extn. Edn. 16(1 & 2): 46-50.

Sinha, M.N., Sinha, P.R.R. and Sohal, T.S. 1974. Attributes of Potential Adopters of Cattle Feed Mixture. Indian J. Extn. Edn. 10(3 & 4): 46-47.

Sinha, P.R.R. and Kolte, N.V. 1974. Adult Education in Relation to Agricultural Development - An Evaluative Study of a Development Block in Andra Pradesh. N.I.C.D., Hyderabad.

Sivakumar, P.J. 1983. Impact of Agricultural Research Stations and Farms on the Cultivation of Crops by the Farmers of the surrounding area. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

Sohal, T.S. and Tyagi, K.C. 1978. Role of Knowledge in Adoption of Dairy Innovations. Indian J. Extn. Edn. 14(3 & 4): 16-25.

Sohi, J.S. and Kherde, R.L. 1980. A Study of Dairy Adoption Behaviour of Small and Marginal Farmers in Punjab. Indian J. Extn. Edn. 16(1 & 2): 84-86.

Somasundaram, D. 1970. A Study on the Process and Technique of Demonstration in Coimbatore District. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

*Somasundaram, D. 1976. A Diagnostic Study of Small Farmers with respect to new agricultural technology and its effective communication for Adoption. Ph.D. Thesis (unpubl.). I.A.R.I., New Delhi.

Somasundaram, D. and Singh, S.N. 1978. Factors Affecting the Knowledge of Adopter and Non-adopter Small Farmers. Indian J. Extn. Edn. 14(1 & 2): 30-34.

Sreekumar, N. 1985. Comparative Analysis of Adoption Behaviour, Economic Performance and Management Orientation of Borrowers and Non-Borrowers of Bank Credit of Calicut District in Kerala State. M.Sc.(Ag.) Thesis (unpubl.). U.A.S., Bangalore.

Srinivasan, C.A. 1981. Dryland Technology Adoption - A Critical Analysis. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

*Strow, Helen 1968. Showing How the Demonstration Teaching Methods. United State Department of Agriculture, Washington.

*Supe, S.V. 1969. Factors Related to Different Degrees of Rationality in Decision-Making Among Farmers. Ph.D. Thesis (unpubl.). I.A.R.I., New Delhi.

Supe, S.V. and Salode, M.S. 1975. Impact of National Demonstration on knowledge and adoption level of farmer-participants. Indian J. Extn. Edn. 11 (1 & 2): 36-39.

Sushama, N.P.K., Menon, A.G.G. and Bhaskaran, C. 1981. Adoption Behaviour of Selected Tribes of Kerala. Indian J. Extn. Edn. 17 (1 & 2): 71-76.

Swaminathan, M.S. 1966. National Demonstration for Higher Rice Yield. Indian Farming. 61(6): 67-70.

Thankaraju, V. 1979. Adoption of Sericulture Technology by Trained and Untrained Sericulturists. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Thangavelu, A. 1979. A Multi-Dimensional Study on Farm Credit of a Nationalised Bank. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Theodorson, G.A. and Theodorson, A.G. 1970. A Modern Dictionary of Sociology. Methuen and Co. Ltd., London.

Thiagarajan, B. 1981. The determinants of Summer Cropping in IADP District. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Tyagi, K.C. and Sohal, T.S. 1984. Factors Associated with Adoption of Dairy Innovations. Indian J. Extn. Edn. 20(3 & 4): 1-8.

Thurstone, L.L. 1946. Comment. Amer. J. Sociology. 52.

Thurstone, L.L. and Chave, E.J. 1929. The Measurement of Attitude. Chicago University Press, Chicago.

Veerasamy, S. and Bahadur, T. 1979. Some Psychological Correlates of Adoption of Improved Rice Technology by Small Farmers of South Arcot District. Indian J. Extn. Edn. 15 (3 & 4): 87-89.

Vellapandian, C. 1974. A Study on Adoption Categories of Some Improved Agricultural Practices. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Venkidusamy, G. 1977. Study of the motives of Small Farmers in Project (SFDA) and Non-Project Blocks for the adoption of HYVs of Cotton. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Vijayakumar, P. 1983. Impact of Special Agricultural Development Units on the Agricultural Development of Rural Areas in Kerala. M.Sc.(Ag.) Thesis (unpubl.). College of Agriculture, Vellayani, Trivandrum.

Vijayaraghavan, P. 1977. Study of the Factors Affecting the Knowledge and Adoption of HYVs of Paddy by Small and Marginal Farmers. M.Sc.(Ag.) Thesis (unpubl.). Agricultural College and Research Institute, T.N.A.U., Coimbatore.

APPENDICES

APPENDIX I

THE STATEMENTS SELECTED FOR DEVELOPING THE SCALE FOR MEASURING THE ATTITUDE OF FARMERS TOWARDS NATIONAL DEMONSTRATION PROGRAM

Statements	'S' value	'Q' value
* 1. National Demonstration is the best method of demonstrating convincingly to the farmers, the production potentialities of unit area of land.	8.33	0.60
2. National Demonstration is the best way to popularise high yielding varieties of crops.	5.55	1.97
3. National Demonstrations help in improving the knowledge of farmers about improved practices.	7.65	1.92
4. National demonstrations play an important role in teaching and improving skill of farmers.	7.00	2.75
5. National Demonstrations help to develop favourable attitude among the farmers towards scientific crop development.	7.66	1.80
6. It motivates action	6.59	1.75

Statements	'S' value	'Q' value
* 7. National Demonstration is a mere waste of money, time and effort.	1.24	1.05
8. Involvement of scientists helps to develop a scientific outlook among the farmers.	6.75	2.03
* 9. National Demonstration is a boon to the farmers as it makes provision for direct guidance and advice from the research scientists.	7.57	1.60
10. Scientists' involvement helps to bring reliable and complete technological information to the farmers without any loss.	6.72	2.40
* 11. Each farmer-demonstrator is better educated regarding the technology through National Demonstrations.	6.91	1.50
12. Allotment of demonstration to each subject matter specialist makes them concentrate on their work more effectively.	6.50	2.36
13. Timely solution for field problems is obtained from National Demonstration Scientists.	6.93	1.73

Statements	'S' value	'Q' value
* 14. The Scientists cannot solve specific problem of the farming community.	1.73	1.42
* 15. It is a waste of time for scientists to meet farmers.	1.26	1.12
16. National Demonstration is an active bridge between lab and land.	7.33	2.16
17. The direct involvement of scientists helps in identifying problems in the application of improved crop management.	7.50	1.93
* 18. National Demonstration serves as best classrooms for teaching the appropriate techniques to the farmers.	7.83	1.84
19. National Demonstration is a blessing to small and marginal farmers.	6.64	2.66
20. Since actual cultivators with small holdings are selected, the high yields obtained are not attributed to the effect of affluence.	5.67	3.70
* 21. The fixed target kept as 9/11 t/ha in two or three crops motivates the farmers to putforth all efforts to achieve it.	6.50	1.05

Statements	'S' value	'Q' value
* 22. The Scientists are very particular in insisting on their own findings to be adopted.	3.16	5.00
23. The approach of multiple cropping is the best way to get maximum return from unit area of land.	7.25	2.66
24. Multiple cropping provides for maximum and effective utilization of existing land area of the farmer.	7.35	2.76
25. The recommendations under National Demonstrations cannot be applied to field situation.	1.85	1.58
* 26. Multiple cropping helps in efficient utilization of the applied fertilizers by the different crops grown.	5.94	2.50
27. The concept of multiple cropping being the key note of National Demonstration is a blessing to the tropical farmers.	6.78	1.82
28. The specific recommendations based on site factors help in economic use of inputs of production.	7.50	2.03
* 29. The improved technology is not feasible to ordinary farmers.	2.58	1.73

Statements	'S' value	'Q' value
30. National Demonstration is a tool to convince the 'show-me' type of farmers.	7.95	3.28
31. Maximum food production is best achieved through National Demonstration.	6.66	3.40
32. National Demonstration is a tool to prove the worth of improved practices.	7.65	1.92
33. It is a method to educate the farmers.	7.59	2.00
* 34. National Demonstration is in no way better than the demonstrations conducted by extension workers.	2.86	2.10
35. Subsidy acts as an incentive to encourage action.	6.12	3.25
36. Farmers agree to take up the demonstration by keeping their eyes on the subsidy amount alone.	2.56	2.49
37. Farm production has substantially increased because of National Demonstrations.	6.50	2.42
38. The scientists have no better expertise than the extension personnel of the Dept. of Agriculture.	1.70	1.65

Statements	'S' value	'Q' value
39. More number of National Demonstration must be conducted.	8.27	1.94
40. All districts should be brought under National Demonstration Program.	8.41	1.47

* Statements included in the final scale.

Appendix II

INTERVIEW SCHEDULE

1. Respondent Number
2. Village
3. Block
4. District
5. Name and address
6. Age of the respondent in years
7. Socio-economic status

   (1) Occupation:

   Labourer/Caste occupation/Business/Cultivation/ Services

   (2) Education:

   A. Husband's education

   Illiterate/Can read only/Can read and write/ Primary/Middle/High School/Graduate

   B. Wife's education:

   Illiterate/Can read only/Can read and write/ Primary/Middle/High School/Graduate

   (3) Family (a) Type - Single/Joint

   (b) Size - Below 5/5 and above

(4) Annual income a) Agriculture - Rs.

b) Others - Rs.

c) Total - Rs.

(5) Social participation:

a) Member of one organisation

b) Member of more than one organisation

c) Office bearer

d) Wider public leader

(6) Land a) Wet - acres

b) Dry - acres

c) Garden - acres

(7) Home:

A. Thatched/Tiled/Concrete

B. Lighting facilities - Kerosine lamp/ Electricity

C. Ownership of house - Rented house/ Own house

(8) Material possession:

(a) Mould board plough : Nos.

Reaper :

Sprayer :

Duster :

Storage iron bin :

(b) Vehicle:

Cycle	:
Motor cycle	:
Tractor	:
Electric-motor	:

(c) Sources of information:

Radio	:
News paper	:
Farm Magazine	:
Agricultural publications	:

(9) Animal possession:

Bullocks	:	Nos.
Cow	:	"
Poultry	:	"

8. Mass Media participation

Sl. No.	Media participation	Two or more times a week	Once a week	Once a fort-night	Once a month	Never
1.	Reads newspaper					
2.	Listens to radio					
3.	Listens to Rural Radio program					
4.	Views T V					
5.	Reads farm maga-zines and other literature on agriculture					

9. Cosmopoliteness

(a) How many times do you visit the nearby town?

Two or more times a week	Once a week	Once a fortnight	Once a month	Never

(b) Purpose of visit

Agricultural	Personal	Entertainment	Others

(c) Membership in any outside village/town organisation : Yes/No

10. Extension orientation

a) Extension contact:

Frequency of meeting Agricultural Officer/ Agricultural Demonstrator/Block Development Officer/Gramsevak

i) Two or more times/week
ii) Once a week
iii) Once to thrice a month
iv) Never

b) Extension participation

Sl. No.	Activities	Whenever conducted	Not attending all the times whenever the activities are conducted	Never
1.	Meetings			
2.	Seminars			
3.	Exhibitions			
4.	Filmshows			
5.	Farmers' days			
6.	Demonstrations			
7.	Field days			

11. Crop yield index

Crop	Yield in kg/acre Respondent's	Average of the Village	Area covered in acre	2/3x100	4 x 5
1	2	3	4	5	6
1. Paddy					
a) Virippu					
b) Mundakan					
2. Coconut					
3. Banana					
4. Tapioca					

12. Economic Performance Index

Sl. No.	Season	Enterprise	Total acreage under the enterprise	Qty. produced/acre (Qtls)	Total production	Value per unit	Total value	Cost of production per unit produce	Total cost of production	EPI Items 8/10x100
1	2	3	4	5	6	7	(8)	9	(10)	11
1		Paddy								
	(a) Virippu									
	(b) Mundakan									
2		Coconut								
3		Banana								
4		Tapioca								

13. Scientific orientation

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

Statements	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
i) New methods of farming give better results to a farmer than the old methods.					
ii) The way of farming of our forefathers is still the best way to farm today.					
iii) Even a farmer with lot of farm experience should use new methods of farming.					
iv) A good farmer experiments with new ideas in farming.					
v) Though it takes time for a farmer to learn new methods in farming, it is worth the efforts.					
vi) Traditional methods of farming have to be changed in order to raise the living of a farmer.					

14. Management orientation

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

Statements	Agree	Disagree
A. Planning orientation		
1. Each year one should think afresh about the crop 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, fertilizer, plant protection chemicals needed for raising a crop should be assessed before cultivation.		
4. It is now 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

Statements	Agree	Disagree
1. Timely planting of crop ensures good yield.		
2. One should use as much fertilizer as he likes.		
3. Determining fertilizer dose by soil testing saves time.		
4. For timely weed control one should even use suitable herbicide.		
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 use is not so useful to a farmer.		
2. A farmer can get good price by grading his produce.		

Statements	Agree	Disagree
3. Warehouse can help a 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.		

15. Rationality in Decision-Making.

Please indicate how you have arrived at the following decisions by selecting the most appropriate reason (only one) in your case.

A. Decision on the area to be put under paddy last year.

1. Ease of cultivation
2. Availability of water/labour/credit
3. Market conditions
4. Always sows the same area
5. Requirement of rice for the family
6. Do not know

B. Decision on sowing only the specific variety and not others.

1. Recommendation of Extension/Research personnel
2. Recommendation of fellow farmers
3. Used same seed last year
4. Meets the specific needs (disease resistent, salt tolerant etc.)
5. Used seeds which are available
6. Do not know

C. Decision on the method of sowing (transplanting/ broadcasting).

1. Special qualities of the method
2. Recommendation of other farmers
3. General experience gained
4. Recommendation of Extension/Research personnel
5. Followed the same practice last year
6. Do not know

D. Decision on the quantity of fertilizer used last year.

1. General experience gained
2. Used what I had at hand
3. Soil test results
4. Recommendation of other farmers/neighbours/ dealers
5. Recommendation of Extension/Research personnel
6. Do not know

E. Decision on the various measures of plant protection.

1. Recommendation of Extension/Research personnel
2. Nature of damage
3. Used the chemical which was available
4. General experience and knowledge
5. Recommendation of neighbours/other farmers/ dealers
6. Do not know

16. Innovation-proneness

Mark your agreement/disagreement to the following statements.

a) (i) I try to keep myself upto-date with information on new farm practices, but that does not mean that I try all the new methods on my farms (2)

(ii) I feel restless till I try out a new farm practice, I have heard about (3)

(iii) They talk of many new farm practices these days but who knows if they are better than the old ones (1)

b) (i) From time to time I have heard of several new farm practices and I have tried out most of them in the last few years (3)

(ii) I usually wait to see what results my neighbours obtain before I try out the new farm practices (2)

(iii) Somehow I believe that the traditional ways of farming are the best (1)

C. (i) I am cautious about trying a new practice (2)

(ii) After all our forefathers were wise in their farming practices and I do not see any reason for changing these old methods (1)

(iii) Often new practices are not successful, however, if they are promising I would surely like to adopt them (3)

17. Communication skill

	Always	Often	Some-times	Seldom	Never
Do you					
1. Listen patiently to what others say?					
2. Encourage others to raise questions?					
3. Initiate discussion?					
4. Illustrate a point by examples and anecdotes?					
5. Summarise points made?					
6. Analyse and evaluate the problem?					
7. Talk in pervasive tone with moderate pitch and proper gesture?					

18. Knowledge of farmers about the demonstrated cultivation practices of paddy

A. Use of high yielding variety.

1. Which of the following is a high yielding short duration variety?

   (a) Chitteni (b) Cheradi (c) Mahsuri

   (d) Triveni

2. What is the duration of Jyothi variety?

   (a) 90 - 95 days (b) 110 - 125 days

   (c)120 - 125 days (d) 125 - 145 days

3. Which of the following varieties is resistant to blast disease?

   (a) Bharathi (b) Jyothi

   (c) Triveni (d) IR-8

4. When do you transplant the short duration high yielding variety seedlings to the main field?

   (a) When they are 15 days old

   (b) When they are 18 - 20 days old

   (c) When they are 25 days old

   (d) When they are 35 days old

B. Soil testing

1. What is the purpose of soil testing?

   a) to apply fertilizers on the basis of soil test results

   b) to know the structure of soil

   c) to apply fertilizers and other amendments on the basis of soil test results.

2. Soil to a depth of ..... is collected for testing.

   (a) 6 inches (b) 15 inches

   (c) 10 inches (d) 20 inches

3. The optimum time for the collection of soil from paddy fields for testing is

   (a) during growth stages of paddy

   (b) before starting the land preparation operation

   (c) at any time

4. The minimum quantity of soil to be collected for soil testing is

   (a) 200 g. (b) 1 kg.

   (c) 500 g. (d) 2 kg.

C. Liming

1. What is the purpose of liming paddy fields?

   (a) to correct soil acidity

   (b) to correct soil alkalinity

   (c) to increase water holding capacity of soil

   (d) there is not much use

2. How will you apply lime in the paddy field?

   (a) entire quantity as basal dose

   (b) half basal and the other half one month after transplanting

   (c) 3/5 basal and 2/5 one month after transplanting the seedling

D. Use of chemical fertilizers

1. How will you apply Ammonium sulphate/urea to paddy crop?

   (a) Entire quantity as basal dose

   (b) Entire quantity as top dressing

   (c) Split doses in different growth phases

2. How will you apply super phosphate to paddy crop?

   (a) Entire quantity as basal dose

   (b) Entire quantity as top dressing

   (c) Split application in different growth phases

E. Use of plant protection chemicals

1. What is Sevin?

   (a) fungicide (b) weedicide

   (c) pesticide (d) fertilizer

2. Please mention the chemical used for the control of rice leaf roller

   (a) Ekalux (b) Malathion

   (c) Rogor (d) DDT

3. How much quantity of Ekalux 25 EC is required for an acre of paddy for the control of leaf roller?

   (a) 400 ml. (b) 500 ml.

   (c) 750 ml. (d) 1000 ml.

4. Please mention the chemical used for the control of blast disease of paddy

   (a) Hinosan (b) Bordeaux mixture

   (c) Sevin (d) Ekalux

5. How much quantity of Hinosan is required for an acre of paddy for the control of blast disease?

   (a) 200 ml. (b) 500 ml.

   (c) 750 ml. (d) 1000 ml.

19. <u>Attitude of farmers towards the demonstrated cultivation practices of paddy</u>

Different people feel differently about the cultivation practices of paddy demonstrated under the National Demonstration Program. You too may be having some opinion.

Here are some statements. Please indicate your response by marking (✓) against each statement in the appropriate column.

A. Use of High yielding varieties

	Strongly Agree	Agree	Unde-cided	Dis-agree	Strongly Dis-agree
1. If we want to produce enough rice the best way is to cultivate high yielding varieties of paddy.					
2. High yielding varieties are no better than local varieties.					
3. Cultivation of high yielding varieties has brought a new light in the field of agriculture.					
4. It is not profitable to cultivate high yielding varieties of paddy.					
5. The utilisation of more input in the cultivation of high yielding varieties of paddy is fruitful.					

	Strongly Agree	Agree	Unde-cided	Dis-agree	Strongly Disagree
6. As the high yielding varieties of paddy are more frequent in the incidence of pest and disease, it is uneconomic to cultivate.					
B. Soil testing					
1. If we want to apply the correct doses of fertilizers and lime the best way is to do soil testing.					
2. Soil testing is only a waste of money and time.					
3. Soil testing facilities should be increased in our area.					
4. Soil testing results recommend high doses of fertilizers and lime for paddy cultivation.					

	Strongly Agree	Agree	Unde-cided	Dis-agree	Strongly disagree
5. All farmers should test their soil for raising paddy crop.					
6. Educational facilities should be improved to make the people aware of the importance of soil testing.					
C. Liming					
1. Liming improves the fertility status of soil.					
2. It is not profitable to apply lime.					
3. The use of lime is essential for better crop yields.					
4. Educational facilities should be increased to make the people aware of the importance of liming.					

	Strongly Agree	Agree	Unde-cided	Dis-agree	Strongly disagree
5. Liming is only a waste of money and time.					
6. All farmers of my area should apply lime.					
D. Use of chemical fertilizers.					
1. The yield of paddy has been increased considerably by the use of chemical fertilizers.					
2. The use of chemical fertilizers is the best way to increase the yield of paddy crop.					
3. The paddy crop fertilized become susceptible to pests and diseases.					
4. The use of chemical fertilizers makes the soil poor.					

	Strongly Agree	Agree	Unde-cided	Dis-agree	Strongly Disagree
5. The application of Chemical fertilizers is a practically useful practice.					
6. The use of chemical fertilizer is the easiest way to increase the yield of paddy.					

E. Use of plant protection chemicals

1. After the introduction of plant protection chemicals there has been a reduction in the failure of crop due to pests and diseases.					
2. The paddy crop applied with chemicals deteriorates the quality of grains.					

3. Application of plant protection chemicals is the easiest way to save the crop from pests and diseases.

	Strongly Agree	Agree	Unde-cided	Dis-agree	Strongly disagree
4. Application of plant protection chemicals has created more pollution problems rather than solving pest and disease problem.					
5. All paddy cultivators should apply plant protection chemicals.					
6. It is worthwhile to invest much in the use of plant protection chemicals.					

20. Extent of adoption of demonstrated cultivation practices of paddy.

A. Variety

a) Have you cultivated high yielding variety? Yes/No

b) If yes, name the variety.

Area cultivated (ha.)

1.

2.

B. Soil testing

a) Did you test your soil? ... Yes/No

If yes,

b) Quantity of soil collected :

c) Place of collection of soil :

d) Time (Season) of collection :

C. Liming

a) Did you apply lime/dolomite? Yes/No

b) If yes,

Based on soil test data:

	Qty.	Time	Extent of area (ha)
Lime :			
Dolomite :			

Not based on soil test data:

Lime :			
Dolomite :			

D. Use of chemical fertilizers

a) Did you apply fertilisers? Yes/No

b) If yes,

Based on soil test data:

Basal dose	Top dose	Total	Extent of area (ha.)
N (....)...kg	N(....)...kg	N(....)...Kg	.....
P (....)...kg	P(....)...kg	P(....)...kg	.....
K (....)...kg	K(....)...kg	K(....)...kg	.....

Not based on soil test data:

Basal dose	Top dose	Total	Area (ha.)
N(....)...kg	N(....)...kg	N(....)...kg	.....
P(....)...kg	P(....)...kg	P(....)...kg	.....
K(....)...kg	K(....)...kg	K(....)...kg	.....

E. Use of plant protection chemicals

Was there any pest/disease attack in your crop during Virippu season? Yes/No

If yes,

a) Name of pests. Name of chemical. Dosage. Area (ha.)

b) Name of disease. Name of chemical. Dosage. Area (ha.)

21. Attitude of the farmer-demonstrators and neighbouring farmers towards National Demonstrations

Given below are some statements regarding National Demonstration. Please indicate your response by marking (✓) against each statement in the appropriate column.

Statements	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. National Demonstration is the best method of demonstrating convincingly to the farmers, the production potentialities of unit area of land.					
2. National Demonstration is a mere waste of money, time and effort.					
3. Scientists cannot solve specific problems of the farming community.					
4. Each farmer-demonstrator is better educated regarding the technology through National Demonstrations.					

	Strongly agree	Agree	Unde-cided	Dis-agree	Strongly dis-agree
5. It is a waste of time for scientists to meet farmers.					
6. National Demonstration is a boon to the farmers as it makes provision for direct guidance and advice from the research scientists.					
7. The scientists are very particular in insisting on their own findings to be adopted.					
8. Multiple cropping helps in efficient utilization of the applied fertilizers by the different crops grown.					
9. The fixed target kept as 9/11 t/ha in 2 or 3 crops motivates the farmers to put forth all efforts to achieve it.					

	Strongly agree	Agree	Unde-cided	Dis-agree	Strongly dis-agree
10. The improved technology is not feasible to ordinary farmers.					
11. National Demonstration serves as best class room for teaching the appropriate techniques to the farmers.					
12. National Demonstration is no way better than the demonstrations conducted by extension workers.					

22. <u>Perception of the farmer-demonstrators and neighbouring farmers about the methodology followed in conducting National Demonstrations</u>

A few statements regarding the methodology followed in conducting National Demonstrations are given below. Indicate your perception by marking (✓) in one of the columns against each statement.

Statements	Most appro-priate	Appro-priate	Unde-cided	Less appro-priate	Least appro-priate
1. Procedure followed in selection of farmer-demonstrators.					
2. Selection of site for demonstration.					
3. Preparation of the plan of work.					
4. Efforts taken in giving publicity to the demonstrations.					
5. Appropriateness in the placing of sign boards in attract-ing attention of farmers.					
6. Arrangements made for the supply of inputs.					
7. Technical guidance provided.					
8. Periods at which supervision was made by the scien-tists.					

Statements	Most appro- priate	Appro- priate	Unde- cided	Less appro- priate	Least appro- priate
9. Type of trainings provided.					
10. Recommendations given for the specific sites.					
11. Time of conduct of field days.					
12. Number of field days conducted.					
13. Participation of neighbouring farmers in field days.					
14. Time of conduct of seminars.					
15. Number of seminars conducted.					
16. Provisions for feedback.					

23. Constraints experienced by the farmer-demonstrators in conducting the demonstrations

Certain problems that the beneficiaries of National

Demonstrations may encounter with are given below. On the basis of your experience, please mark (✓) in one of the columns against each problem.

Sl. No.	Problems	Most felt	Felt	Less felt	Least felt
1.	Risk involved in making the demonstration a success				
2.	Facing the enemity of other farmers				
3.	Lack of interest on the part of other farmers in visiting the demonstration plot				
4.	Lack of timely guidance and supervision.				
5.	Inadequate trainings given				
6.	Involvement of inexperienced scientists				
7.	Lack of follow-up				
8.	No provision for feedback				
9.	Trainings conducted were not based on the farmers' needs				

Sl. No.	Problems	Most felt	Felt	Less felt	Least felt
10.	The seminars conducted were not based on cultivators' needs				
11.	Field days conducted were not appropriate				
12.	Inadequate supply of inputs				
13.	Untimely supply of inputs				
14.	Lack of technical knowhos				
15.	Incompatibility of recommendations				
16.	Unavailability of plant protection equipment				
17.	No help from other agencies				
18.	Any others (specify)				

AN ANALYSIS OF THE EFFECTIVENESS OF NATIONAL DEMONSTRATIONS CONDUCTED BY THE KERALA AGRICULTURAL UNIVERSITY

BY
SYAMALA, K. S.

ABSTRACT OF THE THESIS
SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENT FOR THE DEGREE
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DEPARTMENT OF AGRICULTURAL EXTENSION
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ABSTRACT

With a view to study the effectiveness of the National Demonstrations on the behaviour of farmers, the present investigation was undertaken under the title "An Analysis of the Effectiveness of National Demonstrations Conducted by the Kerala Agricultural University". Effectiveness was measured in terms of the farmers' knowledge about, attitude towards and adoption of the demonstrated cultivation practices of paddy and their attitude towards the National Demonstration Program. The farmers' perception about the methodology followed in the conduct of the demonstrations and the constraints experienced by the farmer-demonstrators in conducting National Demonstrations were also analysed.

The study was conducted in Quilon district where the Program is ongoing. The sample consisted of 46 farmer-demonstrators and 100 randomly selected neighbouring farmers. Data were collected using interview schedule and suitable statistical techniques were employed in the analysis of the data.

The study revealed that the farmer-demonstrators' knowledge about, attitude towards and adoption of the

demonstrated practices were significantly affected by the National Demonstration Program. The farmer-demonstrators' attitude towards the Program was also favourable. But the effectiveness of the Program was much less among the neighbouring farmers.

The selected independent variables together contributed significantly in the variation in the knowledge about and attitude towards the demonstrated practices of the farmer-demonstrators, but not in their adoption and attitude towards the Program. In the case of the neighbouring farmers, the contribution of the selected independent variables in the variation in their knowledge, attitude and adoption of the practices and attitude towards National Demonstration Program was significant.

The methodology followed in the conduct of the demonstrations was not satisfactory as perceived by the farmers. The results of the constraint analysis also pointed out that follow-up trainings and field days 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 Program to reach its cherished goals.