A STUDY ON THE IMPACT OF INTENSIVE PADDY DEVELOPMENT PROGRAMME IN KERALA

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THESIS

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TRIVANDRUM

1978

DECLARATION

I hereby declare that this thesis entitled " A Study on the Impact of Intensive Paddy Development Programme in Kerala " 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, fellowship, or other similar title, of any other University or Society.

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(KALEEL, F.M.H.)

Vellayani,

16th August, 1978.

CERTIFICATE

Certified that this thesis, entitled " A Study on the Impact of Intensive Paddy Development Programme in Kerala " is a record of research work done independently by Shri. F.M. Humayun Kaleel, under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship, or associateship to him.

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(KALEEL, F.M.H.)

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INTRODUCTION

Attaining self-sufficiency in food production in India has just been a mirage until very recently. With a population of over 600 million which swells at alarming rate, a relative stability in food production and a substantial buffer stock are essential for warding off hunger and famine. Once the production potential of our agriculture is raised, the consequences of weather induced fluctuations in total production can be faced without undue difficulty through appropriate changes in crop planning. However, it is not possible to increase food production emphasing on one particular aspect of agricultural production alone. We have to make a co-ordinated approach. Therefore, the concept of co-ordinated development was introduced and a number of development programmes were started in quick succession. One of the important attempts in this direction was the " Intensive Agricultural District Programme" started in 1961 in 7 selected districts in India. It aimed at combining technical know-how with credit, supplies and services required for stepping up Agricultural production. Later, this programme was extended to 30 districts in India. " Intensive Agricultural Area

Programme" yet another effort in the same direction was launched by the Government of India in 1964.

During 1967-1968, another programme, multiple cropping was launched and additional area was brought under multiple cropping. It aimed at increasing cropping intensity through better utilization of existing irrigation facilities available in different parts of the country.

High yielding dwarf varieties were evolved in 1966-'67 and closely on the heels of this innovation a new programme viz. high yielding variety programme was initiated in all the states in India and this aimed at substituting the local traditional varieties of cereals with improved high yielding dwarf varieties. Major thrust in almost all these programmes was in increasing the production of food grains, particularly rice and wheat.

Intensive paddy development (IPD) programme.

Though all the above programmes were implemented in Kerala State also, giving emphasis, understandably, on increasing the production of rice which is the staple food grain of keralities, However, programmes of this kind did not achieve the expected break-through in rice production.

Half the rice grain requirement of the state is even now met by imports from other States. The scope for expansion of area under rice in the state is rather limited. Therefore, the only way to increase rice production in the state is to adopt intensive cultivation in the available area adopting improved agricultural technology and by increasing the gross area under rice by multiple cropping. Aiming at the goal of rapid increase in rice production through intensive development, a novel programme called " Intensive paddy Development Programme" popularly known as " Ela " programme was started in Kerala in 1971.".(Ela means a continuous stretch of paddy fields.) The objective of the scheme is " to enhance the output of rice per unit area by using high yielding varieties of seeds and by ensuring adequate supply of inputs and credit combined with technical know-how".

In this programme, contiguous rice tracts are identified and are organised into Intensive Paddy Development units of 200 hectares, to start with. Now there are 434 IPD units in Kerala monitered and operated by the Department of Agriculture.

This programme calls for co-ordinated efforts of all the agencies providing the inputs and infra-structure for the allround development of the 'ela' with active involvement of the majority of the local farmers. Such a broad based programme necessitates a democratic set up with farmers' unreserved involvement, from planning to the implementation of various activities of the unit. For this an ela committee with the following members is constituted.

i. Not more than 3 representatives of progressive cultivators.

ii. One representative of the concerned Panchayat.

iii. One member from the Board of Directors of the Service Co-operatives, or any other nominees of the society.

iv. One representative of the Minor Irrigation Department.

v. Junior Agricultural Officer (Member-convenor).

In every unit, taking into consideration the infra-structural facilities available and the need of the 'ela', a time bound plan is prepared by the committee for implementation in the 'ela'.

Need for the study

The IPD programme envisages the participation of the majority of small farmers in the ela by: -

1. pooling the resources of the participants as a first step to joint farming,
2. collectively ensuring the inputs and conducting farm operations by raising common nursery etc and thus ensuring better economic return,
3. generating local leadership, co-operation and enthusiasm with a view to achieving increased production in rice,
4. providing necessary technical know-how, and
5. promoting the popularisation and spread of high yielding varieties by stabilizing the cultivation.

The 'ela programme' is being implemented in the state from 1972 onwards. But no effort has so far been made to make an empirical study on the effect of this programme on the diffusion of rice production technology among the farmers in the context of their socio-economic and personal characteristics. Therefore, the present study was undertaken with the broad objective of investigating into the impact

of the IPD programme on the adoption behaviour of rice farmers. The specific objectives of the study were:-

1. To study the extent of adoption of recommended practices by the rice farmers due to the IPD programme, \
2. to study the gain in knowledge on improved farm technology by the rice farmers due to the IPD programme,
3. to study the extent of participation of farmers in the agricultural extension programmes,
4. to find out the relationship of the above dependant variables with selected independent variables and
5. to identify the constraints in the adoption of improved practices in rice cultivation as perceived by farmers.

Scope and limitations of the study

This study will help in streamlining the working of the IPD organizations on a better footing by correcting the deficiencies and strengthening the advisory services at the IPD unit level, for serving the farming community better.

With about 500 IPD units in the State, it was rather impossible to cover all the IPD units by the investigator with the limited time and other resources available at

his disposal. Hence the study was limited to 2 IPD units selected at random in Trichur district. And also the size of the sample and the variables for the study was limited to the manageable size. However, every effort was taken to see that the objectivity of the study was not lost.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

A review of the researches in a particular field of study helps the research worker to acquint himself with the problem, various emprical measures used and also with the findings obtained in these studies. The review presented in this chapter is dealt with under the following headings.

a. Review of studies related to the selected variables.
b. Definitions.
c. Hypotheses.

a. Review of studies related to the selected variables.

The broad objective of the present study is to find out the impact of IPD unit on the adoption behaviour of rice farmers. Adoption behaviour includes both obtaining knowledge on practice (covert) and the actual use of these practices (overt). At operational level, habitual participation in extension activities is also a type of behaviour to be inculcated in the clientele through developmental activities. Production of favourable changes in these 3 important aspects of behaviour of farmers should, therefore, necessarily be resulted by the activities of IPD units. Major chunk of the efforts of IPD units is

directed at intensive extension activities aimed at the diffusion of technical knowledge for translation into action by farmers. Therefore, it is imperative that the efforts of IPD units should result in the optimal use of improved rice cultivation practices, increased knowledge on these practices and in increased participation in the extension activities of IPD unit by farmers. Hence adoption of improved rice cultivation practices, gain in knowledge on these practices and participation in extension activities are the resultant variables of IPD unit activities. It can be argued that the participation of farmers in extension activities and gain in knowledge on subject matter are pre-requisites for the adoption of improved practices and that participation and gain in knowledge are only related factors (independent variables) of the adoption behaviour (dependent variables). But it is not the nature of the variables that make them dependent or independent, but the way in which they are used (Travers, 1964). As the gain in knowledge and participation in extension activities of the farmers are the imminent results of the activities of the IPD units, they are considered and used here as

dependent variables. Further, the gain in knowledge on improved practices need not necessarily result in the adoption of the same. Also participation in extension activities need not necessarily result in the adoption of improved practices. In the light of the above (i) extent of adoption of improved practices in rice cultivation by the rice farmers (ii) knowledge gained on subject matter by the rice farmers, and (iii) extent of participation of rice farmers in agricultural extension activities are used in this study as dependent variables.

i. <u>Adoption</u>.

Behaviour refers to anything the individual does. Skinner (1952) defined behaviour as " all forms of processes, adjustments, activities and experiences of the organism." Bholen and Beal (1960) concluded that a unit act consisted of (1) the receipt of the stumulus (2) interpretation of the stimulus and the circumstances under which it is received and (3) a response or action. Therefore human behaviour is the response or action in response to stimulus. Adoption is a type of behaviour which involves the acceptance and use of practices, products etc.

According to Ramsey et al.(1959) adoption behaviour involves two components, behavioural and cognitive. Behavioural adoption (overt) includes the actual use of the practices and cognitive adoption (covert) includes obtaining knowledge and critical evaluation of the practice in the individual situations. According to Rogers (1962) adoption is " a decision to continue full use of an innovation". The present study takes into consideration both the overt and covert behaviours of farmers. Deway and Humber (1966) suggested that human behaviour has a trinomial nature, out of which (1) environment - with social, cultural and geographical aspects (2) acquired variables including the subjective and covert ideas, beliefs and feelings on one hand and overt on the other hand. This concept gives more importance to personal and situational factors.

A number of variables associated with the adoption behaviour of individuals have been identified by various research workers. Education, convition about utility of improved practices, farm size, availability of infrastructural facilities, fragmented holdings, poverty, illiteracy,change proneness, conservatism, age, frequency of contact with extension agencies, social participation, caste, enthusiasm,

adaptibility of practices, language facility, cosmoplitness, vision bearing capacity and attitude towards practices were found to have relationship with the adoption behaviour of farmers by Ryan and Gross (1962), Chattopadhyay (1963), Pandit (1964), Singh et al.(1965), Gupta (1965), Jha and Singh (1966), Rajendra (1966), Singh (1966) and Singh and Singh (1970).

ii. Knowledge.

English and English (1958) defined " knowledge as a body of understood information possessed by an individual or by a culture". Knowledge is knowing what to do next, skill is knowing how to do it and virtue is doing it.
Ramsey et al.(1959) suggested that cognitive adoption (covert) includes obtaining knowledge and critical evaluation of the practices in terms of the individual situation. The educational activities tend to increase the knowledge of the participants in these activities. Various extension activities undertaken by different agencies in the agricultural sector are expected to provide opportunities for the participating farmers to gain knowledge and skill about agricultural practices. Acquiring knowledge by the

clientele is probably the incipient but immediate result of exposing them to educational activities by efficient limiting agencies.

Following factors have been found to possess positive bearing on acquiring knowledge by Copp (1956), Bose (1961), Bhaskaram and Mahajan (1968), Copp et al.(1969), Bharadwaj (1970) and Behra and Sahoo (1975).

Formal education, Participation in formal organisation, Listening to Radio and Age.

iii. Participation.

According to Krech, Cretchfield and Ballachery (1962) factors related to an individual's participation in a programme were of two types. Positional and background which refer to the position a person occupies and psycological factors which influence the manner in which the roles associated with the various positions are performed, respectively. Participation, therefore, involves the position an individual occupies and the role associated with the position. In other words, participation is the involvement of the individual in respect of the roles assigned to the position held by the individual.

Participation of farmers in various activities to play their role fruitfully as farmers is the concern of the agricultural development agencies.

In the present study participation means the involvement of the farmer by taking part in extension programmes like discussion meetings, result demonstrations, training camps, campaigns and harvest festivals organised by the IPD units or by any other agency. Therefore, such participation is necessary to achieve the objectives of the agricultural developmental agencies. Participation of farmers in different developmental activities is the resultant behaviour of the activities undertaken by various developmental agencies and organisations. Not many studies have been conducted about the factors related to the participation of farmers in development programmes. However, education, irrigation facilities, membership in co-operatives and age have been found to influence the participation of farmers in different agricultural programmes, in separate studies conducted by Gupta (1967 &1968), the Directorate of Economics and Statistics (1967) and Rajaram (1973).

Review of studies.

Studies on the specific variables associated with each of the above dependant variables are reviewed below.

Adoption of improved agricultural practices.

Age, contact with extension agencies, Education, size of holding, social participation, Income and Caste were selected as independent variables of Adoption.

i. Age.

Previous workers have obtained contradictory results in respect of the relationship of age with adoption behaviour of farmers.

Ban (1957) reported that progressive farmers in Netherlands were young in age than the non progressive farmers. Rogers and Burdge (1962) also reported that younger age was associated with innovativeness of farm technology. Pandit (1964) found that majority of non-adopters and reverters of improved agricultural practices were those with older age (above 46 years) in an East Bihar Village. Rajendra (1968) found that age was an important discriminating factor between two groups of adopters studied by him. In his studies on the adoption behaviour of Jowar farmers,

Kadam (1969) obtained significant correlation between age and adoption of hybrid jowar. Kamalsen (1971) observed an increase in rate of adoption of agricultural practices with increase in age as expressed by the trainees of the farmers training camps. Anbalagan (1974) found that young farmers adopted more improved agricultural practices of high yielding varieties of paddy than older farmers. Basha, Menon and Chandrakandan (1975) also observed that age was highly significant to innovativeness of farmers.

The review presented above indicated that age may have influence on the adoption behaviour of farmers.

ii. Contact with extension agencies.

A number of extension agencies, both official and voluntary, operate in the farm front diffusing improved agricultural practices among the farmers. Farmers' contact with these extension agencies is likely to encourage adoption of new technology.

Gross (1949) observed significant relationship of formal and informal extension agencies with the adoption of farm practices by farmers. Lionberger (1952) also

reported that formal and informal agencies were significantly related to the adoption of practices by farmers. According to Wilkening (1952), low adoption of improved agricultural practices by the farmers was due to less contact with extension agencies. Roy et al.(1958) found that the relationship between adoption of improved agricultural practices by the farmers and their contacts with extension agencies was positive, serving this as a useful prediction factor of adoption behaviour of Indian farmers. Rogers and Capener (1960) found that farm operators who made greater use of extension agencies were characterised by more education, a higher social status and higher adoption of farm practices than the farmers with less contact with extension agencies. Bose (1961) reported that low adoption of improved agricultural practices was due to less contact with extension agencies. He also observed that the formal and informal agencies significantly influenced the adoption of agricultural practices by the farmers and the frequency of contact with extension agencies was significantly related to the adoption of agricultural practices by the farmers. Sawhney (1961) had also reported that low adoption of improved agricultural practices was due to

less contact with extension agencies by the farmers. Sharma (1966) reported that adoption of farm practices was a consequence of the extent of contact with information sources and communication channels. Duraiswamy (1975) found that farmers with more contacts with extension workers adopted more number of practices.

Based on the above review it was postulated that contact with extension agencies might be related with the adoption behaviour of farmers.

iii. Education.

Education is the process of bringing about desirable changes in the human behaviour. Level of education, as a factor influencing adoption of improved practices has been subjected to empirical tests by a number of previous workers. Results of studies relevant to the present study alone are included under this review.

As early as 1930, Wilson and Jaccard have pointed out relationship between adoption of improved farm practices and educational level of the farmers. Studies conducted in India and abroad by Wilkening (1953), Dimit (1954), Ban (1957), Rahim (1961), Gupta (1962), Pandit (1964), Shankariah (1965), Thakur (1966), Choudhary (1967),

Rai (1967), Kadam (1969), and Dudhani and Rao (1969) support these findings. Singh (1970) observed that education of the farmers was the main character which was responsible for adoption of improved practices.

Kamalsen (1971) found that rate of adoption of high yielding varieties of rice was significantly higher among farmer trainees with higher education. Sundraswamy (1971) also recorded significant influence for education on the adoption behaviour of farmers. In his studies among Kerala farmers, Hussain (1971) found that the more educated the farmer, the more likely he was to show better response to the adoption of improved practices of rice. Perumal and Duraiswamy (1972) found that the cultivation of hybrid maize was strongly and positively related to farmers' educational level. Subramaniyam and Lakshmana (1973) have also reported that education had positive relationship with adoption of improved farm practices. Chandrakandam (1973) also found positive relationship with education of farmers and adoption of agricultural practices. Zeaudeen and Srinivasan (1974) also found that the adopters of improved practices in farming had relatively better educational level than non-adopters. Anbalagan (1971) reported that

adopters of practices were having College education among the cultivators of high yielding varieties of paddy. Subramaniyam and Menon (1975) found marked difference in the educational status of growers and non-growers of IR-8 rice. Sundaraswamy and Duraiswamy (1975) also reported that adoption of recommended agricultural practices increased with rise in educational level of the farmers.

In the light of the review presented above, it was hypothesised that educational level of farmers may be related to their adoption.

iv. Size of holding.

Earlier studies conducted both in India and abroad by Gross (1949), Marsh and Coleman (1954), Ban (1957), Jones (1960), Dube (1961), Sawhney (1961), Choudhary (1965), Ratanchand and Gupta (1966), Singh and Sohal (1967), Directorate of Economics and Statistics, Government of India (1967) and Dudhani and Rao (1969) have found that size of holding and positive relationship with adoption of agricultural practices. Hussain (1971) reported that farmers with larger holdings readily adopted the recommended package of practices compared to the medium and small size farm holders. In their study with maize farmers,

Perumal and Duraiswamy (1972) found that size of holding had a positive bearing on the cultivation of hybrid maize and also noticed that farmers with large areas readily took to cultivation of hybrid maize. Subramaniyam and Lakshmana (1973) also observed that farm size had positive and highly significant relationship with adoption at one per cent level. Chandrakandan (1973) had pointed out that farm size was positively associated with adoption of NPK complex fertilizers by farmers in Tanjore district of Tamilnadu. Zeaudeen and Srinivasan (1974) observed that cultivators with large sized farm more rapidly adopted the given technological change while the cultivators with small holdings did not adopt. Anbalagan (1974) found that large size of holdings were positively associated with adoption. Studies made by Karim and Mahboob (1974) also revealed that farm size had high positive relationship with adoption of fertilizers. Sharma and Nair (1974) found that size of holding was positively and significantly related to adoption behaviour of farmers. Singh and Choubey (1974) reported that there was a strong positive correlation between the operational farm size of farmers and the adoption of high yielding varieties technology.

Subramaniyam and Menon (1975) observed that farmers with bigger size of holdings favoured the adoption of IR-8.

The research works cited above clearly indicate positive relationship between the size of holdings of farmers and their adoption behaviour in respect of improved agricultural practices.

v. Social participation.

Most of the studies reviewed here indicate positive relationship between participation in formal organizations and adoption.

Lionberger and Coughenour (1957) found significant relationship between membership in formal organizations and adoption behaviour of farmers. Reddy (1962) observed that social participation of farmers had positive relation to their adoption behaviour. Tripathi (1963) and Sriballah (1963) reported that membership in organizations resulted in better adoption of improved practices by farmers. Tiwari (1964), Yadava (1964), Verma (1964) and Singh (1964) also observed that membership in organisations influenced adoption of improved agricultural practices by farmers. Ratanchand and Gupta (1966) have also obtained positive

relationship between adoption and social participation. Subedar (1968) and Kadam (1969) observed that adoption of agricultural practices had significant correlation with participation of farmers in voluntary organizations. Kamalsen (1971) found that farmer trainees with higher social participation had adopted more improved agricultural practices. Ramamurthy (1973) observed that social participation was positively associated with adoption of NPK complex fertilizers by cultivators. Chandrakandan (1973) reported that social participants were better adopters than others. Karim and Mahboob (1974) found that higher organizational participation of aman rice growers resulted in their higher adoption of fertilizers. Sharma and Nair (1974) reported that social participation of rice farmers in Kerala was significantly related to the adoption behaviour of farmers. Supe and Salode (1975) found that social participation was an important factor in distinguishing the growers and non-growers of improved rice. Basha and Menon (1975) reported that social participation was significantly related to innovativeness of farmers. Sundaraswamy and Duraiswamy (1975) also observed that farmers who had higher social participation adopted more number of recommended practices.

vi. Income.

Copp (1956) observed that innovators in agricultural practices had higher income. Jalihal (1960) reported that higher economic status was positively related with adoption of improved farm practices. Rao (1961) observed that higher economic status of the farmers was positively related to adoption of cowdung gas plant by them. Hussain (1971) reported that the number of farmers adopting all the package of practices were more among medium and high income groups than among those with low income group. Sundraswamy (1971) observed that economic status had significant influence on the adoption behaviour of farmers. Perumal and Duraiswamy (1972) reported that cultivation of hybrid maize which was a new introduction was strongly and positively related to farmers' income. Chandrakandan (1973) found that farmers with higher income was found to be better adopters of agricultural practices in rice in Tanjore district. Ramamurthy (1973) found that gross income and other economic status were positively associated with adoption of NPK complex fertilizers by farmers in Poonamalle Block of Chingle district in Tamil Nadu.

Somasundaram and Duraiswamy (1975) reported that higher income group of farmers tended to learn new practices since they had necessary resources to apply the same in their farms. Sundaraswamy and Duraiswamy (1975) found that higher economic status of the farmer was positively related to adoption of improved farm practices.

The above review indicates that income of the farmers may be related to the adoption of improved agricultural technology.

vii. Caste.

Castes and sub-castes have been in existance in India for centuries for historical reasons. Many studies have been made to find out the influence of caste on the adoption behaviour of farmers.

In studying the relationship between caste structure and high yields of rice in three villages of West Bengal, Bose (1963) found that the caste structure in Edapur village positively influenced its agriculture and eventually yields of crops. Sumatimulay and Ray (1965) reported that the support of the caste group was an important factor for adoption or non-adoption of agricultural practices.

Rajendran (1966) observed that there was a significant difference between the adopters of the three castes, namely agricultural caste, lower caste and scheduled caste. Singh and Singh (1967) reported that caste played a very important role in the adoption of practices. Subramaniyan and Lakshmanan (1973) found that caste of the farmer had positive relationship with adoption of package of practices.

Research studies cited above indicate that caste of farmers may have relationship with their adoption behaviour.

II. Knowledge of subject matter gained by the farmers.

Age, contact with extension agencies, education and social participation were selected as specific variables.

1. Age.

Bhaskaram and Mahajan (1968) found that young and middle aged farmers were slightly superior to the old age group in the matter of retension of knowledge about the extension methods. After making studies among farmer trainees Kamalsen (1971) observed that there was an observable increase in knowledge gained by farmers as their age increased. Behera and Sahoo (1975) reported that

young farmers had better knowledge and information about the National demonstration than other farmers.

However, Singh and Prasad (1974) reported that age had no significant relationship with the knowledge quotient of the communication sources of young farmers.

The above findings suggest that there may be a relationship between age and the knowledge gained by the farmers.

ii. Contact with extension agencies.

Knight and Singh (1975) reported that characteristics such as contact with extension agencies, cosmopoliteness and greater adoption had positive association with gain in knowledge of the farmers. Zeaudeen and Srinivasan (1977) reported that 63.3 per cent of the adopters secured information about hybrid cumbu through extension agencies.

The above findings suggest positive relationship between the contact of farmers with extension agencies and gain in knowledge about farm practices.

iii. Education.

Education is the process of producing desirable changes in the knowledge, skill, attitude etc. of the people. Therefore gain in knowledge is the resultant behaviour of education, formal or informal.

Copp (1956) reported that formal education helped farmers in acquiring more knowledge through reading and writing. Bose (1961) also observed that formal education influenced knowledge gained by farmers. Sangle (1962) concluded that knowledge has got significant relationship with education of farmers. Bhaskaram and Mahajan (1968) found that education of farmers in general had shown a close positive relationship with response to extension teaching, both in respect of retention of knowledge and acceptance of the practice. Kilte (1970) reported that formal education helped the farmer in understanding and acquiring more knowledge. Supe and Salode (1975) reported that formal education was significantly related to the level of knowledge of farmers. While studying the impact of National Demonstration on adoption of agricultural practices, Behera and Sahoo (1975) found that educated farmers had better knowledge and information about the demonstration than other farmers.

Based on the review presented above, it may be postulated that education may increase the knowledge level of farmers.

iv. Social participation.

Copp, Neal and Gross (1969) reported that participation of farmers in informal organizations increased the possibilities of increased social interaction which in turn helped in increasing the level of knowledge about new farm practices by the farmers. Singh and Prasad (1974) found that social participation was positively related to knowledge of communication source of young farmers.

The above review indicate that participation of farmers in organizations may be related to gain in knowledge about farm practices.

III. Participation of farmers in agricultural extension programmes.

Participation of farmers in agricultural extension programme was the third dependant variable selected for the study. Age, contact with extension agencies, education and income were selected as independant variables of this dependant variable.

1. Age.

Rajaram (1973) found that age was related to the different levels of participation of farmers in the agricultural development programme.

Based on the above findings it may be postulated that the age of farmers might be related to the participation of agricultural Extension programmes.

ii. Contact with extension agencies.

Diraviyam (1972) observed that contact with extension agencies was positively associated with farmers' participation in crop yield competitions.

The number of studies made on this variable was found to be very few though very intensive search was made. However, it may be postulated that relationship exist between the contact of farmers with extension agencies and their participation in agricultural extension programme.

iii. Education.

Gupta (1967) reported that the participants of high yielding varieties programme in Aligarah district were only marginally better off in education as compared to non-participants. Gupta (1968) concluded that non-participants in high yielding varieties programmes in general had lower literacy level than participants. He found that more than 50 per cent of the participants had formal education. Desai and Desai (1968) in their study of high yielding

varieties programme in Kaira district of Gujarat found that 72 per cent of participants had formal education. Diraviyam (1972) found that education was positively associated with farmers' participation in crop yield competition. Ramakrishnan (1974) found that majority of the members of farmers' discussion groups were literate.

Rajaram (1973) reported that education was not related to the different levels of participation of farmers in the agricultural programme.

Based on the above review it is postulated that education may improve participation of farmers in agricultural extension programmes.

iv. <u>Income.</u>

No study specifically related to the influence of income on the participation of farmers in agricultural extension activities was forthcoming in spite of very intensive search.

<u>Conclusion</u>.

The above review reveals that all dependent variables and independent variables influence the adoption of improved agricultural practices and related activities by the farmers though inconsistancy in relationships

was noticed in some cases. The review also brought out that wholesome assessment of the impact of various agricultural activities particularly, newer agricultural development programmes was lacking. It was further evidenced that no empirical studies were made on the impact of the IPD programme on the different dependent variables selected for the study.

b. Definitions.

The selected variables were defined as follows for the present study.

i. Age.

In the present study the age was defined as the number of years completed by the respondent after his birth.

ii. Contact with extension agencies.

For this study, contact with extension agencies was defined as the farmer's frequency in contacting the extension agents like Junior Agricultural Officer, Village Extension Officer, Demonstrator etc.

iii. Education.

In the present study education was defined as the educational level of the respondents of the study.

iv. Size of holding.

In the present study size of holding means the extent of paddy land owned by the respondent at the time of conducting the interview.

v. Social participation.

Social participation refers to the participation of respondent farmer in formal and informal organizations.

vi. Income.

Income refers to the total annual income earned by the farm family. For the purpose of this study income means the annual income of the respondents. Income includes the receipts obtained from agricultural and other subsidiary occupation also.

vii. Caste.

A caste is an aggregate of persons whose share of obligation and privileges is fixed by birth, sanctioned and supported by religion. For this study caste of a respondent is defined as the caste to which he belonged at the time of interview.

c. Hypotheses.

Based on the theoretical orientation and the review of literature the following hypotheses were formulated to test the relationship of dependant variables with independent variables.

I. Adoption.

i. Age: Age will have a positive relationship with adoption.

ii. Contact with extension agencies: There will be a positive relationship between adoption and contact with extension agencies.

iii. Education: Adoption will be positively related to education.

iv. Farm size: Adoption will be positively related to farm size.

v. Social participation: Social participation and adoption of improved agricultural practices will be positively related.

vi. Income: There will be a positive relationship between income and adoption.

vii. Caste.

There will be a positive relationship between adoption and caste.

II. Gain in knowledge:

i. Age: Age of the farmer will positively influence the gain in knowledge of the farmers.

ii. Contact with extension agencies: Gain in knowledge will have positive relationship with contact with extension agencies.

iii. Education: There will be significant relationship between gain in knowledge and education.

iv. Social participation: There will be a positive relationship between knowledge and social participation.

III. Participation in agricultural extension programmes.

i. Age: Participation in the agricultural extension programmes and age will be positively related.

ii. Contact with extension agencies: There will be a positive relationship between participation in agricultural extension programmes and contact with extension agencies.

iii. Education: It is hypothesised that participation and education will be positively related.

iv. Income: Income will have no relationship with participation in agricultural extension activities.

MATERIALS AND METHODS

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This chapter deals with the materials used and the methods employed in this study and consists of the following five parts:

1. Location of the study.
2. Procedure followed in the selection of the sample.
3. Procedure followed in the selection of independent variables and constraints.
4. Procedures used for the empirical measurements.
5. Procedures followed for the collection of data,
6. The statistical procedures used for the analysis of the data.

1. Location.

Trichur district in Kerala State was selected for the study by lot method of random sampling. Total geographical area of Trichur district according to village papers is 299390 hectares, out of which the net area sown is only 161513 hectares. Area sown more than once is 84295 hectares. The average yield of rice during 1975-1976 in the district was 1289 kg/hectare.

2. Selection of sample.

Two IPD units, one from among the 1972 series and another from among the 1975 series were selected for the study.

Two IPD units started at different times were selected with a view to assessing the impact of IPD units due to the time factor.

a. Selection of IPD units (Experimental area).

When the 'Ela programme' was launched in 1972 in Kerala, 4 units were started in Trichur district. One unit from among the 1972 series of IPD units was selected randomly by using random numbers. The IPD unit thus selected was the Kodakara IPD unit situated about 18 km from Trichur town. Sample farmers selected from this unit will be hereafter called as 'A' group. Out of the 8 IPD units started in 1975 in Trichur district, one unit was randomly selected using random numbers. Panachery IPD unit situated 14 km from Trichur town was the second unit thus selected. Respondents selected from this unit was designated as group 'B'.

The Kodakara IPD unit with 310 hectares had 920 farm families and the Panachery IPD unit comprising 290 hectares had 233 farm families. Thus two IPD units, namely

Kodakara IPD unit and Panachery IPD unit formed the experimental area of the study.

b. Selection of non-IPD area (control area).

As it was not possible to obtain information on the pre-IPD unit status of the respondents in the experimental area, a control group was selected to facilitate easy comparison.

Tiroor, with a total area of 305 ha and 760 farm families was selected purposily as a shadow-non IPD area because all the infra structure facilities available at the experimental IPD units were available in this area also. Further, Government have already initiated action for starting an IPD unit in this area. Sample group of farmers selected from this area was designated as group 'C'.

c. Selection of respondents.

50 farmers from the Kodakkara IPD unit (group A) and 50 farmers from Panachery IPD unit (group B) were selected at random using random numbers from among the farmers included in the list maintained by the Office of the concerned Junior Agricultural Officer.

50 farmers were selected at random using the random numbers from the control area (Tiroor) using the list of

farmers collected by the Agricultural Demonstrator of the area (group C).

Thus 150 farmers - 50 each from the two experimental IPD units and one control area - formed the sample for this study.

Thus group 'A' consisted of 50 farmers from Kodakara IPD unit, group 'B' consisted of 50 farmers from Panachery IPD unit and group 'C' consisted of 50 farmers from Tiroor area (control).

3. Selection of independent variables and constraints.

1. Selection of independent varibbles.

For selecting independent variables, a detailed study of the available literature in the subject matter was made and based on this study a tentative list of independent variables for each of the dependent variables was prepared. Each item in the list was arranged in a continuam consisting most important, important, less important and unimportant levels and scores 3, 2, 1 and 0 respectively were assigned to determine comparative importance of the variables. The list was then given to judges consisting

of the extension personnel of the IPD units and extension experts of Kerala Agricultural University. Based on the response of the judges, following variables which obtained highest scores, were selected for the study. The independent variables thus selected were:-

a. Adoption(Dependent variable).

Independent variables: 1. Age
2. Contact with extension agencies
3. Education
4. Social participation.
5. Size of holding.
6. Income.
7. Caste.

b. Gain in knowledge on subject matter(Dependent variable).

Independent variables: 1. Age
2. Contact with extension agencies
3. Education
4. Social participation

c. Participation of farmers (Dependent variable).

Independent variables: 1. Age
2. Contact with extension agencies
3. Education
4. Income

ii. Constraints in the adoption as perceived by farmers.

A tentative list of possible constraints in the adoption of improved practices in rice culture was prepared by consulting relevant literature and experts. This list was put to critical review of a panel of judges consisting of subject matter specialists, extension experts and farmers to select the constraints according to their importance and validity. Each item was arranged in a continuam from most important to least important. Scores were assigned as follows: 3, 2, 1, and 0 respectively. First seven items with highest scores were seelcted; the items selected were lack of credit facilities, irrigation facilities, input supply in time, marketing facilities, no proper enthusiasm of extension personnel, No support price for paddy and labour consuming process (more care and attention).

4. Procedures used for the empirical measurements.

A. Measurement of dependent variables.

1. Extent of adoption of improved agricultural practices.

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 the operators studied.

Duncan and Kreetlow (1954) used a 25 item index of farm practice adoption adapted from the index developed by Wilkening.

Fliegal (1956) constructed an index of adoption of farm practices using the correlation of several adoption variables.

Copp (1956) tried to prepare a Guttman type of scale. He employed correlation technique to select items for the index of adoption.

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

Rahim (1961) conceived four stages with adoption process, namely, awareness, information, trial and adoption. These stages were assigned 1, 2, 3 and 4 points respectively which implied that an individual in the awareness stage, for a particular practice would receive a score of one

and in the adoption stage would receive a score of four. The scores thus obtained on different stage were added up and expressed in percentage of the maximum possible score.

Chattopadhyay (1963) constructed an adoption quotient to measure farm practice adoption. He took into consideration the different variables, like potentiality, extent, weightage and time in developing the adoption quotient.

Roy et al.(1968) tested the inter-stage applicability of the items, the uni-dimensionality, and the normality of the distribution of scores for the three measures of the knowledge, trial and adoption.

Supe (1969) used an unweighted practice adoption score.

Singh and Choubey (1974) used " Adoption of intensity index " for studying differential adoption of high yielding wheat variety technology.

Singh and Singh (1974) used Chattopadhyay's "Adoption quotient" with slight modifications.

The adoption index used by Wilkening (1952) was modified as follows and used for this study. A list of practices was prepared by consulting relevant literature and subject matter experts. 13 practices were selected

by employing the same procedure used as in the case of selection of independent variables. The following practices were selected

1. Variety
2. Seed rate
3. Manures and manuring (a) for medium duration variety and
   (b) for short duration variety
4. Techniques of seed treatment
5. Plant protection methods for
   (a) Paddy blast
   (b) Bacterial blight
   (c) Stem borer
   (d) Case worm
   (e) Leaf roller
6. Water management
   (a) at the time of transplanting
   (b) after transplanting
   (c) 10 days before harvest.

Improved technology recommended in the " Package of practices 1976 " of the Kerala Agricultural University in respect of these practices were followed.

To assess the extent of adoption of the selected recommended practices of rice, the respondents were asked to indicate the number of recommended practices adopted as full adoption/partial adoption/no adoption and scores were assigned as follows:-

Full adoption	2
Partial adoption	1
No adoption	0

A respondent who had not adopted a particular practice was given 'zero' score, a score of 'one' was given if the respondent had adopted a particular practice, but not to the extent given in the " Package of Practices 1976" of the Kerala Agricultural University and two scores were given if the respondent had adopted the practice fully ie.,to the extent given in the recommendations of the Kerala Agricultural University.

All the scores thus obtained by a respondent were added up and the adoption index was calculated by using the following formula.

$$\text{Adoption index} = \frac{\text{total number of scores obtained by a respondent}}{\text{Total raw score}} \times 100$$

For classifying the adoption index into 3 classes low, medium and high, the principle of dividing the entire data into 3 groups with equal frequencies was adopted. This is similar to the concepts of quartiles, quintiles, deciles and percentiles, where the partitioning is into 4, 5, 10 and 100 classes. The formula for the limiting value are as follows:

$$P_{\frac{1}{3}} = L + \frac{\frac{N}{3}-M}{fm} \times C$$

$$P_{\frac{2}{3}} = L + \frac{(\frac{2N}{3}-M)}{fm} \times C$$

L - is the lower limit of the class in which $\frac{N}{3}$ observation lies, M - is the frequency upto that class, fm - is the frequency of the class, C - is the width of the class interval

1. High level adopters: (above $P_{\frac{2}{3}}$) above 14
2. Medium level adopters: (between $P_{\frac{1}{3}}$ and $P_{\frac{2}{3}}$) bet: 9-14
3. Low level adopters: (below $P_{\frac{1}{3}}$) above 9.

ii. <u>Knowledge gained about the subject</u>.

Sankariah and Singh (1967) measured knowledge of the respondents about improved methods of vegetable cultivation based on the teacher made test.

Singh and Prasad (1974) measured knowledge by the knowledge quotient.

$$\text{Knowledge quotient} = \frac{\text{Observed knowledge score}}{\text{actual total score}} \times 100$$

This method was employed in the present study to measure the knowledge gained by the farmers. All the practices selected to measure the extent of adoption were selected for this item also.

To assess the gain in knowledge of the farmers the respondents were asked to indicate the recommended practices for high yielding variety of paddy. Scores were given at the rate of 'one' for these practices which were known and '0' for those practices which were not known by respondents. Thus knowledge quotient was arrived at by adding up all the scores and using the formula.

$$\text{Knowledge quotient} = \frac{\text{Total scores obtained by respondent}}{\text{Total raw score}} \times 100$$

Respondents were categorised according to knowledge quotient into high, medium and low by employing the same method adopted in the case of adoption.

1. High level knowledge - above 8 (scores)
2. Medium level knowledge - between 4-8 (scores)
3. Low level knowledge - below 4. (scores)

iii. <u>Extent of participation of farmers in agricultural extension programmes.</u>

<u>Participation score</u>.

Measurement of participation in this study was done by developing a participation score technique for this study. A list of field level extension activities applicable to both experimental groups and control group was prepared in consultation with the officers in charge of the experimental IPD units and control area. Following activities were finally selected.

1. Discussion meetings,(2) Training camps, (3) Result demonstrations (field day meetings), (4) Campaigns, (5) Harvest festivals. The reference period for this purpose was 12 months prior to the month in which the data were collected.

In the case of discussion meeting, scores were given at the rate of 3, 2,1 and 0 for participating regularly, rarely, when time permited and no participation respectively. The scores obtained by a respondent were multiplied by the number of meetings in which he had attended.

In the case of training camps, if a farmer had just attended one camp he was given a score of 'one' and 'two' scores were assigned if the respondent was an organizer participant of the camp.

Similarly, if a respondent participated in the result demonstration meeting held in the demonstration plots only, he was given 'one' score, and 'two' scores were assigned if the demonstration was laid out in the respondent's field and 'zero' scores was given to the respondent who had not participated in either of the above activities.

In the case of campaigns also scores were given depending upon the extent of participation. For the responcent who have just attended one campaign meeting, a score of 'one' was assigned and for active participation like working as a volunteer, financing the campaigns etc. 'two' scores were given.

To assess the extent of participation in harvest festivals the respondent was given a score of 'one' for participation in harvest festival days and 0 for non participation.

The scores obtained by a respondent for each activity were then multiplied by the number of times of participation in each activity and were added upto obtain the total score of the respondent. Here also the categarisation into high,medium and low were made by employing the same procedure, used in adoption and knowledge.

High participation - above 15 (scores)
Medium participation - between 7 and 15 (scores)
Low participation - below 7 (scores).

B. Measurement of independent variables.

1. Age: In this study age was measured as the number of years completed by the respondent at the time of interview. Age of all the sample respondents were added together, mean and standard deviation were worked out and the respondents were categorised as follows:-

1. Old (mean + 1 S.D.) above 54 (scores)
2. Middle (mean ± 1 S.D.) between 37-54 (scores)
3. Young (mean - 1 S.D.) below 37 (scores)

ii. Contact with extension agencies.

Jaiswal and Singh (1971) used the scoring technique for measuring contact with extension agencies. In the present study the technique used by them was used to find out the contact with extension agents. This was done on the basis of the frequency of the meetings of the respondents with J.A.O., V.E.O., Demonstrator etc. either in the office of these personnel or elsewhere in connection with agricultural activities. Respondents were asked to indicate the frequency of their meetings with J.A.O., Demonstrator, V.E.O., etc. in connection with agricultural activities and scores were assigned as follows:-

Visiting daily	-	5 scores
Once in a week	-	4 scores
Twice in a month	-	3 scores
Once in a month	-	2 scores
Rarely	-	1 score
Never	-	0 score

Total scores obtained by individual respondents were added together and mean and standard deviation were worked out.

Based on the scores thus obtained the respondents were categorised into:-

1. High contact with extension agencies (mean + 1 S.D.) above 9(scores).
2. Medium contact with extension agencies (mean ± 1 S.D.) between 5-9 (scores).
3. Low contact with extension agencies (mean - 1 S.D.) below 5 (scores).

iii. Education.

In the present study educational status of the respondents were measured by adopting the scoring system followed in the socio-economic status scale of Trivedi (1963) with slight modification. The scoring adopted was as follows:-

Illiterate	-	0
Can read only	-	1
Upto primary	-	2
Upto secondary	-	3
College level and above	-	4

iv. Social participation.

The social participation status of respondents were assessed in the present study as per the scoring system

followed in the socio-economic status scale of Trivedi (1963). Social participation of an individual respondent was measured on the basis of scores obtained by him by virtue of his participation in formal organizations like Panchayat, Co-operatives etc. and on any other distinctive features such as member or office bearer in the State level or National level organizations.

Membership in one organization	-	1 (score)
Membership in more than one organization	-	2 (scores)
Office bearer	-	3 (scores)
Distinctive features	-	6 (scores)

Total scores obtained by individual respondent were added together and mean and standard deviation were worked out. Based on the scores thus obtained the respondents were categorised into:-

High	-	(mean + 1 S.D) above 14 (scores)
Medium	-	(mean $\pm$ 1 S.D) between 2-4 (scores)
Low	-	(mean - 1 S.D) below 2 (scores)

v. <u>Size of holding.</u>

In this study size of holding was measured by the actual area of land put under paddy cultivation by the respondents.

The extent of area of land cultivated thus by the respondents was added together and mean and standard deviation were worked out On the basis of which the following categorisation was made.

Big farm size holders (mean + 1 S.D) above 2.2 acres

Medium farm size holders(mean ± 1 S.D) 0.98 -2.2 acres

Small farm size holders (mean - 1 S.D) below 0.98 acres

vi. Income.

According to their income, farmers have been categorised by the Kerala State Planning Board (1970) into 3 levels namely, (1) Upto Rs.3,000 (2) from Rs.3,001 to Rs.6,000/- and (3) Rs.6,001 and above. This categorisation was followed in the present study also. The respondents categorised into three according to income level, were as follows:-

1. High income Rs.6001/- and above
2. Medium income Rs.3001/- to Rs.6000/-
3. Low upto Rs.3000/-

vii. Caste.

The categorisation followed in the Census Report 1971 was followed in the present study also. All the

respondents in the sample were classified into the following three categories by asking them to indicate their caste.

1. Forward - Nairs, Brahmins and Christians
2. Backward - Ezhavas, Muslims and Anglo-Indians
3. Scheduled - Parayans, Pulayans, Vedans etc.

C. Measurement of constraints.

The selected 7 constraints were administered to the respondents and were asked to state their agreement on a five point ranking scale as follows:-

Most important	- 4 scores
Important	- 3 scores
Neither important nor unimportant.	- 2 scores
Less important	- 1 score
Least important	- 0 score

Based on the response given by the respondents the constraints were ranked based on their order of influence.

5. Collection of data.

An interview schedule consisting of structured questions was prepared in English. The address and other

details of the selected respondents were collected from the concerned Officers. The investigator interviewed the respondents with the help of the schedule. Each question in the schedule was put to the respondents in Malayalam in the order in which it was given in the schedule and answers obtained from the respondents were entered in the schedule in the appropriate column . The interviews were conducted from April 5th to May 30th, 1978.

6. Statistical measures used in analysis.

The data collected were put to appropriate statistical tests. Correlation, inter-correlation and chi-square tests were employed to test the empirical hypotheses of this study. The significance of correlation was tested at P. 0.05 level. Chi-square test was used to find out association between the adoption of improved agricultural practices and caste of the respective respondents as the data pertaining to this variable were not amenable to scoring. The analysis of data was done by using the Electronic Computor of the Department of Agricultural Statistics, College of Agriculture, Vellayani.

RESULTS

RESULTS

In this chapter the results of the study are presented in the following sequence:-

I. Frequency distribution of respondents according to the independent variables.

II. Extent of adoption of improved agricultural practices by farmers.

III. Correlation between the extent of adoption and independent variables.

IV. Gain in knowledge about subject matter by the farmers.

V. Correlation of knowledge gained by farmers on subject matter with independent variables.

VI. Extent of participation of farmers in the selected agricultural extension programmes.

VII. Correlation between the extent of participation of farmers and selected factors.

VIII. Interrelationship of the variables.

IX. Constraints in the adoptionof improved practices as perceived by the farmers.

I. Distribution of the respondents according to the independent variables.

Distribution of farmers in groups A, B and C according to the independent variables is presented below:

1. Age.

Distribution of the respondents according to their age is presented in Table 1.

Table 1. Frequency distribution of respondents according to age.

Age	Groups A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Old	9	18	8	16	15	30
Middle	34	68	36	72	30	60
Young	7	14	6	12	5	10
Total	50	100	50	100	50	100

It is seen from table 1 that 30 per cent of respondents in group C were old aged, while it was only 18 and 16 per cent respectively in A and B groups. In groups A and B the respondents under middle age group were high (68 and 72 per cent respectively) compared to group C (60 %). Distribution of young farmers was almost equal in all the three groups.

11. Contact with extension agencies.

The extent of contact of respondents with extension agencies is presented in Table 2.

Table 2. Extent of respondents' contact with extension agencies.

Contact with extension agencies	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
High	20	40	18	36	11	22
Medium	22	44	20	40	18	36
Low	8	16	12	24	21	42
Total	50	100	50	100	50	100

Data presented above show that comparatively higher percentage of respondents belonging to groups A and B had higher contact with extension agencies (40 per cent and 36 per cent in groups A and B respectively) than group C in which only 22 per cent of the respondents had high contact with extension agencies. The data further highlighted that

though there was difference in the frequency of contact with Extension agencies between groups A and B also, lowest level of contact was exhibited by respondents in group C.

iii. Education.

Educational status of respondents is presented in Table 3.

Table 3. Frequency distribution of respondents according to their educational status (in percentage)

Education	Groups		
	A	B	C
Illiterate	6	8	15
Can read only	6	14	23
Primary	32	30	30
Secondary	40	38	24
Collegiate	16	10	8
Total	100	100	100

It can be seen from table 7 that 16 per cent and 10 per cent of the respondents in groups A and B respectively

had collegiate education, whereas it was only 8 per cent in the case of group C. It is further revealed that 40, 38 and 24 per cent in group A, B and C respectively possessed secondary school level of education. It is significant that 15 per cent of the respondents in group C were illiterate, while it was only 6 per cent and 8 per cent in groups A and B respectively. Similarly, 23 per cent of the respondents in group C could read only, while the corresponding percentages in groups A and B were 6 and 14 respectively. This indicated a higher percentage of illiterate farmers and those who can read only in group C compared to the other two groups (A and B). The respondents in group A were found to be superior to the respondents in group B in their educational status through formal schooling.

iv. <u>Social participation</u>.

The extent of social participation of the respondents are presented in Table 4.

Table 4. Frequency distribution of the respondents according to the extent of social participation.

Social participation.	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
High	29	58	28	56	15	30
Medium	15	30	14	28	17	34
Low	6	12	8	16	18	36
Total	50	100	50	100	50	100

Data presented in the above table reveal that majority of the respondents were having high level of social participation in experimental area ie., 58 and 56 per cent respectively in groups A and B, whereas 30 per cent of the respondents only recorded, high level of social participation in group C. Again, low level of social participation was highest in group C (36%) when compared to groups A (12%) and B (16%).

v. Size of holding.

Distribution of the respondents according to the size of holding is presented in Table 5.

Table 5. Frequency distribution of respondents according to size of holding.

Size of holding	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
High	9	18	8	16	6	12
Medium	36	72	35	70	39	78
Low	5	10	7	14	5	10
Total	50	100	50	100	50	100

From the data in table 5, it can be seen that in all the three groups, more than 70 per cent of the respondents were having medium sized holdings. However, bigger holdings were more among the respondents of A and B groups (18 and 16 per cent). The holders of small sized holdings were more or less same in all the groups.

vi. <u>Distribution of the respondents according to level of income</u>.

Respondents according to their level of income is presented in Table 6.

Table 6. Frequency distribution of the respondents according to their level of income.

Income	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
High	13	26	11	22	9	18
Medium	30	60	31	62	26	52
Low	7	14	8	16	15	30
Total	50	100	50	100	50	100

Data presented in table 6 show that majority of the respondents of the experimental groups (A and B) belonged to medium income group. Comparatively high percentage (30.0) of respondents in group C were earning low income whereas it was only 14 per cent and 16 per cent in groups A and B respectively. As much as 26 per cent of the respondents in group A were having high income.

vii. Caste.

Distribution of respondents according to caste is presented in Table 7.

Table 7. Frequency distribution of respondents according to caste.

Caste	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Forward	37	74	39	78	40	80
Backward	7	14	6	12	5	10
Schedule	6	12	5	10	5	10
Total	50	100	50	100	50	100

Table 7 reveals that the respondents belonging to forward caste in all the three groups were high and more or less same. Group C represented maximum percentage (80.0) of forward community. In the case of backward and scheduled castes groups B and C had all most same strength. Group A had more backward and scheduled caste than group B and C.

II. Extent of adoption of selected improved agricultural practices by the respondents.

a. Extent of adoption of selected improved agricultural practices.

A comparison of the adoption behaviour of farmers in the experimental area (group A and B) and control area (group C) was made to find out the impact of the IPD programme on this aspect.

Data on the extent of adoption of selected improved agricultural practices by the respondent are presented in Table 8.

Table 8. Extent of adoption of improved agricultural practices.

Adoption	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Low (Below 9)	10	20	18	36	22	44
Medium (9-14)	16	32	14	28	20	40
High (Above 14)	24	48	18	36	8	16
Total	50	100	50	100	50	100

It can be seen from Table 8 that in group A,48 per cent of the respondents were high adopters, 32 per cent medium level adopters and 20 per cent low in adoption of selected agricultural practices. The corresponding values for group B were 36 per cent, 28 per cent and 36 per cent respectively. But in the case of group C, only 16 per cent of the respondents came under high adoption category. In this group 40 per cent of the respondents were medium level adopters and 44 per cent were low level adopters.

b. <u>Mean scores of extent of adoption</u>.

The data on scores indicating the extent of adoption of improved agricultural practices were subjected to statistical analysis. The mean scores and the C.D. are given in table 9.

Table 9. Mean scores of extent of adoption of improved agricultural practices by the three groups.

Groups	Mean score
A	14.10
B	11.52
C	8.18

C.D. for comparison between A and B = 1.61
C.D. for comparison between A and C = 1.39
C.D. for comparison between B and C = 1.28

The mean score for adoption in group A was 14.10. This was significantly higher than the mean score for groups B (11.52) and C (8.18). Group C had significantly lower score when compared to those of A and B. This shows that farmers in group A were better adopters than group B and group C. Respondents in group B were also significantly better adopters than those of group C.

III. Correlation between the adoption and independent variables.

Relationship of the selected independent variables except caste, with adoption behaviour of farmers was also examined by computing the coefficient of correlation. Results obtained are presented in Table 10.

Table 10. Relationship of the selected independent variables with adoption.

Variables	Correlation coefficient		
	Group A	Group B	Group C
1 Age	0.106	0.098	0.355**
2 Contact with extension agencies	0.529**	0.714**	0.338*
3 Education	0.553**	0.419**	0.243
4 Social participation	0.299*	0.541**	0.098
5 Size of farm	0.030	0.120	0.106
6 Income	0.293*	0.464**	0.284*

* significant at 0.05 level
** significant at 0.01 level

The computed 'r' values for different variables, in group A revealed that all the factors studied except age and farm size were significantly and positively related to adoption behaviour of farmers. All the factors except size of farm and age showed significant and positive relationship with adoption of agricultural practices in the case of group B. But in the case of group C, age, contact with extension agencies, and income were found to be significantly related to adoption, while education, social participation and size of farm failed to give significant relationship.

c. <u>Influence of caste on adoption of agricultural practices</u>.

Influence of caste on adoption of agricultural practices was measured by the contingency coefficient defined as $\sqrt{\frac{\chi^2}{\chi^2+N}}$

The coefficient of contingency of the respondent's caste with adoption of agricultural practices are presented in Table 11.

Table 11. Coefficient of contingency of the respondents' caste.

Groups	Contingency coefficient
A	0.237
B	0.281
C	0.260

Table 11 reveals that adoption behaviour of respondents in none of the three groups (A, B and C) was related to their caste.

IV. Gain in knowledge about the subject matter by the respondents.

One of the aspects examined in the present study was the extent of knowledge gained about subject matter by farmers due to their participation in agricultural extension programmes. The frequency tables corresponding to classification into 3 categories are presented in Table 12.

Table 12. Extent of gain in knowledge about subject matter.

Gain in knowledge	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Low (Below 4)	8	16	14	28	28	56
Medium (4-8)	20	40	18	36	12	24
High(Above 8)	22	44	18	36	10	20
Total	50	100	50	100	50	100

Table 12 reveals that 22 and 18 per cent of the respondents in groups A and B respectively gained high level of knowledge, whereas in group C only 10 per cent of the respondents gained high level of knowledge. Low level of knowledge was gained by only 8 and 14 per cent of the respondents in group A and B respectively (in experimental areas) while it was 28 per cent in the case of control group which is the maximum among all the groups. The most important difference between groups is that in group C 56 per cent of the respondents fall into low level category.

The scores relating to gain in knowledge were analysed and the data are presented in Table 13.

Table 13. Mean scores of knowledge gained by groups A, B and C.

Groups	Mean score
A	8.00
B	6.62
C	4.36

C.D. for comparison between A and B = 0.78
C.D. for comparison between A and C = 0.69
C.D. for comparison between B and C = 0.66

The scores for knowledge level reveal that there is significant difference between the three pairs of group; C shows the least value. This reveals that there was significant difference between groups A and B, group A and C, and groupsB and C.

V. Correlation between the dependent variable (knowledge gained) and independent variables.

Correlation of the selected factors with knowledge gained is presented in Table 14.

Table 14. Relationship of the independent variables with gain in knowledge.

Variables	Correlation coefficient		
	Group A	Group B	Group C
Age	0.086	-0.328*	0.084
Contact with extension agencies	0.610**	0.637**	0.419**
Education	0.577**	0.327*	0.123
Social participation	0.300*	0.440**	0.040

* Significant at 0.05 level
** Significant at 0.01 level

It is seen from the above table in group A that all the factors except age, were positively and significantly correlated with gain in knowledge. In group B, age was found not only not positively related to gain in knowledge but also negatively and significantly related with knowledge gain, whereas all other factors namely social participation and contact with extension agencies, and education were positively and significantly related with gain in knowledge. In the case of group C no relationship was found between gain in knowledge and the selected factors except in the case of contact with extension agencies.

VI. <u>Extent of participation of the farmers in selected agricultural extension programmes</u>.

The extent of participation of respondents in the selected agricultural extension programmes both in the experimental and control areas was studied. The extension activities selected for this study were (1) Discussion meetings,(2) Training camps, (3) Result demonstrations, (4) Campaigns and (5) Harvest festivals.

The extent of participation of farmers in selected agricultural extension programmes is presented in table 15.

Table 15. Extent of participation of farmers in agricultural extension programmes.

Participation	Groups					
	A		B		C	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Low (Below 7)	7	14	15	30	28	56
Medium(7-15)	22	44	15	30	13	26
High(above 15)	21	42	20	40	9	18
Total	50	100	50	100	50	100

Data presented in table 15 reveal that the percentage of respondents with high level of participation were 42 and 40 in groups A and B respectively, whereas it was only 18 per cent in group C. While 14 per cent and 30 per cent of respondents in groups A and B respectively had low level participation, as high as 56 per cent in group C exhibited low level of participation in related extension programme. In group A, 44 per cent of the respondents fell under medium, while it was 30 per cent in group B and 26 per cent in group C.

The data on scores of participation in agricultural extension programmeswere statistically analysed. The results are presented in Table 16.

Table 16. Mean scores of the extent of participation in agricultural extension programmes.

Group	Mean scores
A	14.28
B	6.02
C	4.86

C.D. for comparison between A and B = 3.45
C.D. for comparison between A and C = 3.19
C.D. for comparison between B and C = 1.80

Group A exhibited the maximum mean score. This is significantly higher than those of group B and C. There was no significant difference between B and C. But there was significant difference between groups A and C.

VII. Correlation between extent of participation and independent variables.

Correlation coefficients between the selected factors

and participation of farmers in the agricultural extension programmes are presented in Table 17.

Table 17. Relationship of the selected factors with participation of farmers.

Variables	Correlation coefficient		
	Group A	Group B	Group C
Age	0.095	0.224	0.357**
Contact with extension agencies	0.529**	0.356**	0.212
Education	0.303*	0.417**	- 0.001
Income	0.093	0.237	0.282*

* Significant at 0.05 level
** Significant at 0.01 level

It is evidenced by the data presented in table 16 that in groups A and B, contact with extension agencies, and education were positively and significantly related to participation. But in group C, out of the four factors studied, age and income were found to be significantly and positively related with participation, whereas education of the respondents and contact with extension agencies failed to show significant relation.

VIII. Interrelationship of the dependent variables.

To test the interrelationship of the 3 dependent variables included in the study inter-correlation analysis was taken up. Interrelationship of the dependent factors is presented in Table 18.

Table 18. Interrelationship of the three dependent variables.

Variables		Group A			Group B			Group C		
		X_1	X_2	X_3	X_1	X_2	X_3	X_1	X_2	X_3
Adoption	X_1	.759**	.444**		.866**	.645**		.525**	-.032	
Knowledge	X_2		.370**			.866**			.229	
Participation	X_3									

* Significant at 0.05 level
** Significant at 0.01 level

It is evident from the above table that interrelationship between adoption and gain in knowledge was positive and significant in all the three groups. The relationship between adoption and participation in group C was not significant. Knowledge and participation were found to be related in groups A and B.

Interrelationship of the independent variables.

To test the inter-relationship of the independent varibles included in the study, intercorrelation analysis was done. Interrelationship of the independent variables for three groups are presented in Table 19, 20 and 21.

Table 19. Interrelationship of the independent variables in respect of group A.

Variables		X_1	X_2	X_3	X_4	X_5	X_6
Age	X_1	..	0.23	0.97**	0.02	0.10	0.07
Education	X_2	..	..	0.41*	0.29*	0.16	-0.18
Income	X_3	..	..	..	0.59**	0.67**	0.04
Social participation	X_4	..	..	..	..	0.05	0.36**
Size of farm	X_5	..	..	..	..	..	0.01
Contact with extension agencies	X_6	..	..	..	..	..	..

* Significant at 0.05 level
** Significant at 0.01 level

It is evident from table 19 that in group A, income was related with age, education was positively and significantly related with income as well as social participation.

Income was positively and significantly related to social participation and size of farm. Social participation was related positively and significantly to contact with extension agencies.

Table 20. Interrelationship of the independent variables of group B.

Variables		X_1	X_2	X_3	X_4	X_5	X_6
Age	X_1	..	0.18	0.27*	0.05	0.09	0.29*
Education	X_2	..	..	0.19	0.31*	0.05	0.28*
Income	X_3	..	..	..	0.20	0.10	0.09
Social participation	X_4	..	..	..	..	0.07	0.10
Size of farm	X_5	..	..	..	..	..	0.22
Contact with extension agencies	X_6	..	..	..	..	..	..

* significant at 0.05 level

It is evident from table 20 that age was significantly and positively related to income and contact with extension agencies. Education was significantly related to social participation and contact with extension agencies.

Table 21. Interrelationship of the independent variables in group C.

Variables		X_1	X_2	X_3	X_4	X_5	X_6
Age	X_1	..	0.26	0.13	0.24	0.20	0.27*
Education	X_2	..	..	0.35*	0.27*	0.26	0.28
Income	X_3	..	..	..	0.53**	0.44**	0.03
Social participation	X_4	..	..	..	..	0.12	0.12
Size of farm	X_5	..	..	..	..	..	-0. 01
Contact with extension agencies	X_6	..	..	..	..	..	..

* Significant at 0.05 level

** Significant at 0.01 level

Table 21 revealed that age was significantly and positively related to contact with extension agencies. Education was significantly related to income and social participation. Income was significantly related to social participation and size of farm.

DISCUSSION

Constraints in the adoption.

The constraints in the adoption of improved practices as perceived by IPD farmers according to its rank are presented in Table 22.

Table 22. Constraints in the adoption as perceived by IPD farmers

Constraints	Scores
1. Non-availability of inputs in time	267
2. Lack of irrigation facilities	223
3. Lack of credit facilities in time	205
4. Labour consuming process(more care and attention)	181
5. No support price for paddy	137
6. Lack of marketing facilities	124
7. No proper enthusiasm of extension personnel.	113

DISCUSSION

DISCUSSION

The results obtained in this study are discussed and interpreted in this Chapter under the following sections.

I. Extent of adoption of improved agricultural practices and its relationship with the selected variables.

II. Gain in knowledge about the subject matter by the farmers due to the programme and its relationship with the selected variables.

III. Extent of participation of farmers in agricultural extension programmes and its relationship with selected variables.

IV. Inter-relationship of the variables and constraints in the adoption of modern technology by rice farmers as perceived by them.

I. Extent of adoption of improved agricultural practices.

High adopters of improved agricultural practices were more in the experimental groups (A and B) than in the control group (Table 8). High level of adoption was at the lowest level in the control group. One prominent difference noted between the three groups was significant superiority of experimental groups over the control group in their adoption behaviour (Table 9). The higher level

of adoption in the experimental groups might be due to the intensive extension activities and prompt and adequate arrangement of supplies and services made by the staff of the IPD units. The lack of these activities in the control area might have resulted in the low level of adoption of improved agricultural practices in this group . The higher adoption of improved agricultural practices in the experimental groups might also be due to their conviction about the utility of the improved practices as reported by Roy (1960).

Higher adoption was noticed in 48 per cent of the respondents in group A, while corresponding figure in group B was only 36 per cent. Low level of adoption was also higher in group B than in group A indicating lower adoption in group B. The difference between the two groups also revealed that group A was significantly superior to B group (Table 9). As the group A belonged to the 1972 series of IPD units and group B belonged to 1975 series, the respondents of the former group were exposed to the activities of the IPD unit for a longer period than those in the group B. This difference in the duration of exposure of the

respondants to the educational and other activities of the IPD units might have contributed significantly to the higher extent of adoption of improved practices by the farmers in group A.

The above discussion brings out the favourable influence of IPD units in the adoption of improved practices by the farmers.

i. Age.

Age was not found to be a discriminating factor for adoption of improved agricultural practices in the case of experimental groups. Therefore the hypothesis that age will have a positive relationship with adoption is rejected. This finding is in agreement with the results obtained by Rai (1967), Perumal and Duraiswamy (1972) and Subramaniyam and Menon (1975). This might be due to the exposure of the farmers of all age groups in the experimental area to intensive educational and associated activities of IPD units. Therefore, all the farmers in the experimental area might have become educated and convinced about the superirity of improved practices and

might have obtained the supplies and services necessary to adopt these practices in their farms. These situations might have contributed to higher adoption in the experimental groups irrespective of age which also indicates favourable impact of IPD units in the experimental areas.

In the control group age was significantly related to adoption. Data in Table 1 revealed that maximum number of old farmers and minimum number of young farmers were in the control group. Therefore, in the absence of adequate extension work in the control area the older farmers with the benefit of experience in farming only might have adopted new practices. This again indicates the usefulness of activities of IPD units.

ii. Contact with extension agencies.

As evidenced by Table 10 contact with extension agencies was found to have positive and significant relationship with adoption of improved agricultural practices in the case of respondents in all the three groups (Groups A, B and C). Hence, the hypothesis that contact with extension agencies will positively influence adoption is accepted. This is supported by the findings of Gross (1949),

Lionberger (1953), Roy et al. (1958), Rogers and Capner (1960), Bose (1961), Sharma (1966) and Duraiswamy (1975). They have concluded that farmers with more contacts with extension agencies adopted more number of improved agricultural practices.

However, it was noticed (Table 2) that there was variation in the extent of contact with extension agencies between the three groups. That means, there was some amount of contact with extension agencies in the case of farmers in all the three groups, though not to the same extent. Though not an IPD area, the control area might have had the benefit of some amount of extension work. This might have resulted in the adoption of improved practices by the farmers in this area though at a lower level. It was significant that greater extent of contact with extension agencies in groups A and B coincided with higher extent of adoption in these groups (Table 8 and 10). This association conclusively proved that greater contact with extension agencies was necessary for higher adoption of improved practices. In these cases, the operation of IPD unit programmes might have resulted in greater contact of farmers with extension activities.

iii. Education.

Positive and significant relationship between adoption and educational level of the respondents was noticed in groups A and B, whereas this relationship was not significant in group C. Therefore the hypothesis formulated for this study that education will positively influence the adoption of improved agricultural practices is accepted. The findings of most of the previous worker including Wilson and Jaccard (1930) Ban (1957), Rahim (1961), Gupta (1962), Pandit (1964), Thakur (1966), Choudhary (1966), Rai (1967), Kadam (1969), Sundraswamy (1971), Hussain (1971), Perumal and Duraiswamy (1972), Ramamurthy (1973) and Zeaudeen and Srinivasan (1974) confirm the present finding.

It could be observed from Table 3, that comparatively higher percentage of respondents (38.0) in control area were either illiterate or can read only whereas the corresponding figures in the case of groups A and B were 12 and 22, respectively. Though education at primary level was found to be almost uniform in all the groups, 56 and 48 per cent of the respondents in A and B groups respectively were having education above the primary level,

wereas it was only 32 per cent in control group. The higher level of adoption observed in the case of group A and Bmight be due to the general higher level of education of respondents in these groups which might have enabled them to acquire more information on new improved technology and supplies and services from various sources including cosmopolite sources. Though illiterate farmers and farmers who can read only constituted about 34 per cent of the respondents in A and B groups put together, the continued exposure of these farmers to the extension activities by the IPD units might have supplied all the information and inputs necessary for adoption of improved practices which compensated for their illiteracy and or low level of education. All the above factors might have contributed to the higher adoption of improved agricultural practices by the farmers in groups A and B compared to their counterparts in groups C.

It was noticed (Table 3) that there was difference in the educational status between groups A and B. The percentage of respondents in group A falling under primary, secondary and collegiate levels were more compared with group B and also the percentage of respondents

under illiterate and can read only categories were least in group A. Respondents in group A also belonged to an IPD unit older than the IPD unit to which the respondents in group B belonged. These differences in educational standard and exposure to IPD unit activities between the groups A and B might have resulted in higher adoption of improved practices by farmers in group A.

iv. Social participation.

Social participation was positively and significantly related to adoption of improved agricultural practices in experimental area (groups A and B) whereas no significant relationship was noticed in group C. Hence the hypothesis that social participation will positively influence the adoption of improved agricultural practices is accepted. This result is in conformity with the findings of Reddy (1962), Tripathi (1963), Sriballabh (1964), Ratanchand and Gupta (1966), Subedar (1968), Kandam (1969), Kamalsen (1971), Ramamurthy (1973), Ziual Karim and Mahboob (1974), Supe and Salode (1975) and Basha and Menon (1975).

It was evident from Table 4 that 58 per cent of respondents from group A and 56 per cent from group B were having high level of social participation. In group C, only 30 per cent of respondents had high level of social participation while 70 per cent had only medium and low level of social participation. Low level of participation was also highest in group C.

These variations in the social participation of farmers in the case of experimental groups might have resulted the higher extent of adoption of improved agricultural practices by the respondents in these groups. Because of the activities of the IPD units, the number of organisation (~~Table 4~~) and extent of participation in these organisations in the experimental area might have been much more than that obtained in the control area which might have provided opportunities for better social interactions between the member in the experimental area. Better interaction between the farmer members in organisations help in better exchange of ideas of mutal interest and acquisition of more information about agricultural practices and supplies and services. These

reasons might have resulted in better adoption of improved practices by farmers in groups A and B than farmers in group C. Higher extent of participation was noticed by the farmers in group A than their counterparts in group B. This might be due to the exposure of farmers in group A for a longer period to the activities of IPD units than those in group B.

v. Size of holding.

Size of holding was found to have no significant relationship with adoption in the experimental area and control area. Hence, the hypothesis that size of holding will positively influence the adoption is rejected. This finding is in line with the results obtained by Rajendra (1968). A perusal of the distribution of farmers according to size of holding in the three groups revealed that in all the three groups, the farmers were distributed almost uniformly between the big, medium and small farm categories. Therefore, disregarding the extent of adoption it could be presumed that adoption of improved technology was not influenced by the size of holding. The results of this study have conclusively indicated that the extent of adoption was higher in the experimental groups

than in the control group. These results once again point out the higher amount of extension activities undertaken in the experimental area by the concened IPD unit.

vi. Income.

The 'r' values revealed that there was significant relationship between income of the respondents and adoption in all the three groups (Table 10). Therefore, the hypothesis that income will influence significantly the adoption of improved agricultural practices is accepted. This is in conformity with the findings of Copp (1956), Bose et al.(1964), Misra (1965), Verma (1966) Sha and Agarwal (1970), Hussain (1971), Sundraswamy (1971), Perumal and Duraiswamy (1972), Chandrakandan (1973), Ramamurthy (1973) and Anbalagan (1974). It was evident from Table 6 that more than 80 per cent of the respondents in A and B groups were having more than medium and high level of income, and that 70 per cent of the respondents in group C were having either medium or high level of income. These results indicate that more the income of the respondents higher the adoption of improved agricultural

practices. One of the reasons for the positive relationship between the income of farmers and their adoption of improved agricultural practices might be that increased income increases the risk bearing capacity of the farmers. That means, they try new practices even if it involved the risk of failure and loss of money. Also, higher level of income enables the farmers to contact various agencies and organisations related to agricultural and allied fields for obtaining information on new technology and also to acquire the inputs necessary to put the new technology into practice.

However, there was difference (Table 6) between groups A and B in income level which was reflected in their adoption behaviour also. The above explanations hold good in this case also.

vii. Caste.

The caste of the respondents did not significantly influence the adoption of improved agricultural practices by the respondents eigher in the experimental group or in the control group. Hence, the hypothesis that caste of the respondents will influence positively the adoption of

improved agricultural practices is rejected. This finding agrees with the findings of Saxena (1963), Verma (1964), Misra (1964), Ratanchand and Gupta (1966), Rajendra (1968) and Ramamurthy (1973).

The non-relationship with the adoption of improved agricultural practices and caste might be due to the opportunities available for all respondents to come into contact with the sources of information, for education, to attain credit etc., irrespective of their caste. As equal opportunities for social mobility are available for the people of our country irrespective of their caste, this factor did not naturally influence the adoption behaviour of farmers.

II. Gain in knowledge by the farmers.

In group A, 44 per cent of the respondents and in group B, 36 per cent of the respondents had high level of gain in knowledge while 40 per cent and 36 per cent respectively had only medium level of gain in knowledge (Table 12). In the control area, 24 per cent of the respondents had medium level of knowledge. Farmers with

low level of knowledge was maximum (44 per cent) in control area. Table 13 revealed that there was significant difference in respect of extent of knowledge gained between experimental groups and control group. This significant difference between the experimental group and control group might be due to the exposure of the farmers to intensive extension activities done by the IPD units in the experimental area. In the IPD unit areas various extension activities like demonstrations, campaigns, training camps, harvest festivals etc. are conducted which are designed to impart knowledge on improved practices to the participants. Such educational efforts were more in the experimental area compared to the control area which explains the difference in the gain in knowledge between the farmers in the two areas.

Relationship of the extent of gain in knowledge with four independent variables (age, contact with extension agencies, education and social participation) was worked out.

1. Age.

As in the case of adoption, age was not found as a discriminating factor in gaining knowledge also. As evidenced by Table 14 age was found to have no significant

relationship with knowledge gained by farmers about subject matter in the case of groups A and C, whereas it was significant and negatively related in the case of group B. Hence the hypothesis that age will significantly influence knowledge is rejected. This finding is in agreement with the findings of Singh and Prasad (1974) and Behara and Sahoo (1975). The negative relationship between age and gain in knowledge in groups B and the non significant relationship between these two factors in groups A and C underlines one of the basic tenats of education that the capacity to learn does not decrease with increase in age but only the rate of learning decreases with increase in age.

ii. Contact with extension agencies.

The relationship of gain in knowledge with contact with extension agencies was positive and significant in the case of all the three groups. Hence, the hypothesis that gain in knowledge will have a positive relationship with contact with extension agencies is accepted. This is in conformity with the findings of Knight and Singh (1975), Zeaudeen and Srinivasan (1977). As evidenced by Table 2, in

groups A and B 84 and 76 per cent of respondents respectively had more than medium and high level of contact with extension agencies. Frequent contacts with the various extension agencies by the respondents provided them with better opportunities for obtaining more information on agricultural practices. This might be the reason for the positive relationship between these two factors.

Though positive relationship was exhibited between the contact with extension agencies and gain in knowledge by group C also, the 'r' value in the case of this group was only 0.419 as against 0.610 and 0.637 in groups A and B respectively. Though the control group, being non IPD unit area provided lesser extent of extension activities, the available contact with extension agencies in group C might have influenced the gain in knowledge of the farmer to some extent.

iii. Education.

Knowledge gained about the subject matter by the respondent was positively and significantly related to their educational level in the experimental area, where as the relationship was not significant in the control area.

This finding is in agreement with the hypothesis that educational status of the respondents will positively influence their gain in knowledge. Among others, Copp (1956), Bose (1961), Sangle (1962), Bhaskaram and Mahajan (1968), Supe and Salode (1975) support this finding. As evidenced by the data presented in Table 3, 88 and 78 per cent of farmers in groups A and B respectively had education above primary level, whereas in the case of control area the corresponding value was only 62 per cent. It is also to be noted that maximum number of illiterate farmers were obtained in the control group. The higher level of education for a larger number of respondents in the experimental area presumably contributed for higher gain in knowledge in that area. As the level of education increases, the capacity of the farmers to make more effective use of print media obtained from various sources increases. Educated farmers are likely to make use of both localite and cosmoplolite sources; not only for obtaining information but also for obtaining printed material to supplement the information obtained through word of mouth. The above factors might have contributed to increase gain in knowledge in the case of farmers in the experimental area.

Eventhough the level of education of respondents in groups A and B was significantly related to gain in knowledge, the 'r' value for group A (0.577) was higher than the 'r' value for group B (0.327). The educational status of the farmers in group A was also higher than that in the group B. These variations explain the higher gain in knowledge in the case of group A than in group B.

iv. Social participation.

Positive and significant relationship was exhibited between social participation and gain in knowledge by the farmers in the experimental area . This finding is in conformity with the findings of Copp, Neal and Gross (1969) and Singh and Prasad (1974). Hence, the hypothesis, that social participation will influence gain in knowledge is accepted. It may be seen from Table 4 that 58 per cent and 56 per cent of the farmers in groups A and B respectively had high level of social participation, while in the case of farmers in the control group only 36 per cent had high level of social participation. Participation of farmers in formal organisations will increase their contact with various sources of information. This might have provided the farmers in the experimental

area with higher levels of social participation which in turn helped them to acquire more knowledge about improved agricultural technology.

III. <u>Extent of participation of farmers in agricultural extension programmes</u>.

Positive and significant difference in the extent of participation was noticed between the experimental group A and control group C, though the difference between the experimental group B and control group C was not significant (Table 6). The above results strongly indicate better participation of farmers in extension activities in the experimental area than in the control area. This might be due to the better opportunities for participation in extension activities provided in the IPD units due to the intensive extension work necessitated by the very character of the IPD programme. The extension education activities in the IPD units coupled with better participation of farmers in organisation in these areas might have convinced the farmers about the advantages of improved practices. For obvious reasons, such intensive extension efforts are not undertaken in the control area. All these

might have contributed to better participation of farmers in the agricultural activities in the experimental area.

Relationship of the extent of participation of farmers in agricultural extension programmes with four selected variables, namely, age, contact with extension agencies, education and income was also examined.

i. Age.

Age was found to be positively and significantly related to participation in extension activities in the control group, whereas in experimental groups no significant correlation was exhibited. This findings is in conformity with the studies made by Diraviyam (1972), in which he obtained negative relationship with age and farmers' participation in crop yield competitions. Therefore, the postulated hypothesis that participation in agricultural extension programmes and age will have positive relationship is rejected. In the absence of organised and consistant extension activities in the control area, the farmers were not probably trained for rational thinking and selective action. Therefore the older farmers, presumably due to their experience in farming found out for themselves, the relative advantage in participating in

agricultural extension activities. In experimental areas farmers are exposed to various extension activities systematically and consistently, which might have resulted in better appreciation of such activities. Therefore, the farmers in the experimental area participated in agricultural extension activities irrespective of their age and thus age was not found to be a discriminating factor in the case of farmers in the experimental area.

ii. Contact with extension agencies.

This factor had positive and significant relationship with participation in extension activities in the case of experimental groups only. Diraviyam (1972) also observed that contact with extension agencies would positively influence the participation of farmers in crop yield competitions. In the light of the above, the hypothesis that there will be positive relationship between participation and contact with extension agencies is accepted. Opportunities for contact with extension agencies are naturally more in the experimental area where intensive extension activities are undertaken by the concerned IPD unit. It is only natural that participation in

extension activities are directly proportional to the contact with extension agencies due to the educational and to some extent personal influence of the extension agencies in the IPD units. These factors might have resulted in better participation in extension activities by the respondents in the experimental groups.

iii. Education.

Positive and significant relationship was noticed between education and participation in extension activities in the case of farmers in the experimental groups, whereas in the case of farmers in the control group the relationship was negative, though not significant. Studies conducted by Diraviyam and Ramakrishnan (1974) fully support this finding. Therefore, the hypothesis that participation in extension activities and level of education of farmers will be positively related is accepted. Education produces capacity for rational thinking and sound decision making. The discriminating power is also developed considerably through education. Therefore, formal education of farmers coupled with the extension education makes the farmers more conscious about the utilitarian value of various

extension activities. These may be the reason for better participation of educated farmers in the extension activities in the experimental area.

iv. Income.

Positive and significant relationship with income of farmers and their participation in agricultural extension activities was observed only in the case of farmers in the control group. In the light of the above results the hypothesis that income will not be related with participation in agricultural extension programmes is accepted. The farmers in the experimental area are having regular contacts with extension agents and also are regularly exposed to various agricultural extension activities. Participation of farmers in such activities is not based on income, caste or creed of the participants. Thus every farmer in the experimental groups irrespective of his socio-economic and personal characteristics is provided with opportunities to participate in the extension activities, while in the control group, in the absence of adequate extension activities, only those farmers who have better command of economic resources, educational facilities etc., come

into [illegible] contact with extension agencies. This might be the reason for positive relationship of income with participation in extension activities exhibited by farmers in the control group.

IV. Inter-relationship of variables.

In this section the inter-relationship of dependent variables and also of the independent variables in respect of the experimental groups and control group are discussed.

a. Inter-relationship of dependent variables.

Adoption of improved agricultural practices was positively and significantly related to gain in knowledge and participation in extension activities in both the experimental groups (Table 18). In the control group adoption exhibited positive and significant relationship with gain in knowledge, whereas the relationship with participation in extension activities was negative, though not significant. Gain in knowledge was found to be significantly related to participation in both the experimental groups. Gain in knowledge on improved agricultural technology is likely to bring about better appreciation of the new technology and also help in putting the knowledge into practice.

This finding is in agreement with the findings of Bedi and Saxena (1965),Roy (1965), Basram and Capener (1968) and Sharma and Singh (1975). Better participation in extension activities helped the clientele to acquire more knowledge on new technology which in turn helped the adoption. Studies made by Rao and Menon (1975) support this view. Gain in knowledge in subject matter creates interest in the farmers to acquire more knowledge and thus they participate in extension activities more and more with the objective of taking the full benefit of such extension activities. The above results indicate that two dependent variables namely, gain in knowledge and participation in agricultural extension programmes by farmers, selected for this study are not absolute but related to the adoption behaviour of farmers though these are also the resultant variables of the activities of IPD units.

b. Inter-relationship of independent variables.

In the experimental group A, age was found to be positively and significantly related to only income while in group B it exhibited positive and significant relationship with contact with extension agencies.

Contact with extension agencies and income showed relationship with age in control group (group C). The significant relationship between age and income in the experimental group might be due to the higher income accrued, through years of farming by the respondents. The positive relationship of age with contact with extension agencies in group B and C only, might be due to the comparative low awareness of the younger farmers in these two groups about the new technology. Education was positively related to income in groups A and C. This relationship in group A and C might be due to the fact that better educated farmers are in a better position to make use of various sources of information including the print media and become better equipped for putting the information thus gained for economic gains. The non-significant relationship of education with income in experimental group B located near Trichur Town might be due to the various off farm employment opportunities, which do not require the three 'R's, in the town. Education was positively related with contact with extension agencies in groups B and C, while the same was negative in the

case of A. In the group A, the farmers have been exposed to the agricultural extension activities to a much longer period than those in group B and C. This explains the above variation in relationships. Education had positive relationship with social participation in groups A and B only. This might be due to the more number of organizations functioning in experimental area due to the work of the IPD units than in the case of the control group which is a non IPD area. In groups A and C the income of the respondents showed positive and significant relationship with social participation and farm size, while in group B no such relationship was revealed. Increased income is likely to bring about better control over economic resources and better participation in organizations and increased accumulation of wealth in the form of land.Social participation was positively related with contact with extension agencies in group A only. This might be due to the contact of the respondents with extension agencies for a longer period in group A which belonged to the earlier series of the IPD unit than the other groups. Negative relationship was obtained with size of farm and contact with extension agencies in the

control area. This might be due to the inaddquate extension activities in the control group, compared to the experimental groups. Extension activities in the IPD unit do not differentiate between small holders and big holders of land and tries to bring to its fold all the farmers in the area irrespective of their farm size. Therefore, the above relationship conclusively points out inadequacy of extension activities in the control area.

V. Constraints in the adoption of improved practices on rice cultivation as perceived by the farmers.

An attempt was made to find out the perception of the farmers about the constraints in the adoption of improved practices of rice cultivation. Non-availability of inputs in time ranked first among the constraints. Other constraints perceived by the farmers were lack of irrigation facilities, lack of credit facilities in time, requirement of intensive care, lack of support price for paddy, lack of market facilities and inadequate support from the extension personnel, in that order.

The highest rank obtained by the non-availability of inputs in time clearly points out the necessity for streamlining the supplies and services in respect of the agricultural inputs. Inadequacy of irrigation facilities is highlighted by the high rank it obtained. At present short term loans alone are available for paddy crop and that too only for one season and even this facility is not made available to the farmers in time. These might be the reasons for obtaining the 3rd rank for this constraint. The need for more care and attention for high yielding varieties was also felt by the farmers as an important constraint. Unremunerative price offered for their produce and lack of support price were also pointed out as a important problems.

Inadequate marketing facilities was felt by the farmers as another serious difficulty. Though lack of support from the extension staff obtained only low rank, this is suggestive of the inadequacy of the extension efforts of the staff and also of the lack of faith and confidence in them for the farmers. This situation calls for unreserved educational support to the peasantry by the extension staff.

SUMMARY

SUMMARY

Though a number of agricultural developmental programmes have been implemented in Kerala since independance, even now it is deficient by over 50 per cent in the production of rice which is the staple food grain of the people of the State. In 1972, a novel development programme called Intensive Paddy Development Programme (Ela Programme) particularly oriented to rice production was launched in the State with the objective of enhancing the output of rice per unit area by using High Yielding Varieties of Seeds and by ensuring adequate supply of inputs and credit combined with technical know-how. But no effort has so far been made to make an empirical study of the impact of the programme on the diffusion of rice production technology among the farmers. The present study was an attempt in this direction. The objectives of the study were to find out the extent of adoption of improved practices of rice cultivation, gain in knowledge about the improved practices and extent of participation in extension programmes by the farmers in the programme areas. An attempt was also made to identify the constraints in the adoptionof improved practices in rice production.

The investigation was carried out in Trichur district, Kerala which was selected by lot method of random sampling. Two IPD units - one from 1972 series (group A) and another from 1975 series (group B) randomly selected constituted the experimental area. Another area comparable to the experimental area in all respects except the operation of IPD programme was randomly selected as the control (group C) from the same district

50 farmers each from the three groups were selected at random from among the farmers included in the list maintained in the concerned offices constituted the respondents of the study. Seven independent variables (age, contact with extension agencies, education, social participation, size of farm, income and caste) were selected to find out their relationship with the extent of adoption of improved agricultural practices, knowledge gained and participation in agricultural extension activities by the farmers, which were the dependent variables. The data were collected by interviewing the respondents individually with the help of a schedule developed by the investigator for this study and were analysed by correlation, inter-correlation and chi-square test.

The findings of the study are summarised and presented below:-

Extent of adoption of improved agricultural practices.

High adopters of improved agricultural practices were more in the experimental groups than in the control group. The experiment group A was superior to experiment group B in the adoption of improved agricultural practices. Contact with extension agencies, education, social participation and income had positive and significant relationship with adoption.

Gain in knowledge about the subject matter.

Respondents in the experimental area gained more knowledge about the subject matter. Gain in knowledge was lowest in the control area. The IPD unit belonging to the 1972 series (group A) exhibited more gain in knowledge than in the IPD unit of 1975 series (group B). Education and social participation had positive and significant influence on the gain in knowledge. Age was negatively and significantly related in the case of group B.

Extent of participation of farmers in agricultural extension programmes.

Positive and significant difference in the extent of participation was noticed between the experimental group A and control group C, though the difference between the experimental group B and control group C was not significant. Contact with extension agencies and education had positive and significant relationship with participation.

Computation of inter-relationship between dependent variables showed that adoption of improved agricultural practices was positively and significantly related to gain in knowledge and participation of farmers in agricultural extension activities. Gain in knowledge also had positive and significant relationship with participation.

Constraints in the adoption as perceived by farmers.

Non-availability of inputs in time was felt by the farmers as the most important constraint. Other constraints perceived by the farmers were lack of irrigation facilities, lack of credit facilities, high level of intensive care required by high yielding varieties, lack of support

price for paddy, lack of adequate marketing facilities and inadequate support from the extension personnel, in that order.

The study conclusively proved that the IPD units had favourable impact on the adoption of improved agricultural technology by the farmers in those areas. It also indicated production of increased knowledge on subject matter and also higher participation in agricultural extension activities by the farmers in the IPD unit areas. Two dependent variables namely, gain in knowledge and participation in agricultural extension programmes, selected for this study were found to be not absolute but related to the adoption behaviour of farmers.

REFERENCES

REFERENCES

Anbalagan, S. (1974). A study of factors influencing adoption of package of practices for high yielding variety of paddy, in Post Graduate Research in Extension. edt. John Knight and Subramaniam, V.(1976) Tamil Nadu Agricultural University, Coimbatore.

Appa Rao, G.,and Radhakrishna Menon, K. (1975). Impact of National Demonstration on farmers of two village groups. Madras agric. J. 62 (10-12): 619-621.

Basram, G.S., and Harold, R., Capner, (1968). Factors related to the acceptance of new ideas and techniques in farming, Punjab. Indian J. Ext. Ed. 2: (3&4):107-115.

* Beal, G.M., and Rogers, E.M.(1960). The adoption of two farm practices in Central Iowa Community. Agricultural and Home Economic Experiment Station, Iowa State University of Science and Technology, Iowa Special Report (26).

Bedi, I.S., and Saxena. (1965). Improved Agricultural Practices. Behaviouristic pattern of Farmers in U.P. A.I.C.C., Eco. Rev. 16: 21-31.

Behera, C., and Sahoo, M.S.(1975). Impact of National Demonstration on Adoption of Agricultural Practices. Indian J. Ext. Ed. 11 (1 and 2): 32-35.

Bhardwaj, M. (1970). Impact of Radio Rural Programmes on farmers of Rajendra Nagar Block of Hyderabad district. Andhra Pradesh Agricultural University (Unpublished M.Sc.(Ag.) Thesis).

Bhaskaram, K., and Mahajan, B.S.(1968). Effectiveness of Extension Methods in Gaining knowledge about and acceptance of Agrosan seed treatment to cotton.
Indian J. Ext. Ed. 4: 28 - 33.

*Bablen, Joe. M., and Beal, George, M.(1960). Sociological and social psycological factors related to credit use pattern. Unpublished paper presented at Annual Conference of T.V.A. Co-operators, knoxville.
Dept. of Economics and Sociology, Iowa State University.

Bose, S.P. (1961). Characteristics of Farmers who adopt Agricultural practices in Indian villages.
Rural Sociology, 26(2): 138-145.

Bose, S.P., and Das Gupta, (1962). The Adoption Process. Dept.of Agriculture, Govt. of West Bengal, Calcutta.
Ext. Bull. 1.

Bose, S.P., (1963). A study into Rice yields of a West Bengal Village. Dept. of Agriculture, Govt. of W. Bengal, pp. 36-40.

Chandrakandam. K.(1973). A study on Farm Practice Attributes and Socio personal factor of farmers in relation to Adoption practices. M.Sc. Thesis, Tamil Nadu Agricultural University, Coimbatore.

Chattopadhyay, S.N. (1963). A study of some psycological correlation of adoption of Innovations in farming.
Ph.D. Thesis, New Delhi, India, Library, I.A.R.I.

Choudhary, K.M. (1965). Factors affecting acceptance of improved agricultural practices. Agro-Economic Research Centre.
Sardar Vallabhai Vidyapeeth, Vallah Vidhyanagar.

Choudhary, and Maharaja, (1966). Acceptance of Improved Agricultural practices and their diffusion among wheat growers in the Pali District. Indian J. Agri.Economics. 21: 161-165.

* Copp, J.H.(1956). Personal and social factors associated with adoption of recommended farm practices among cattle men. Hanhattam - Kanas Agril. Exp. Stn. Bull. 83.

* Copp, J.H. et al.(1969). The differential characteristics of an approved agricultural technologicalpractice. Rural Sociology, 14.

* Dube, S.C.(1958). Indias changing villages. Human Factors in Community Development London, Routledge and Kegan Paul Ltd.

Dudhani, C.M.,and Sethu Rao, M.K.(1969). Adopters and their backgrounds factors. Rural India, 32: 214-218.

Duncan, J.A., and Kreetlow, B.W.(1954). Selected cultural characteristics and acceptance of Education Programme and practice. Rural Sociology, 19: 349-357.

Das Gupta, (1963). The Innovators. Department of Agriculture, Govt. of W.Bengal, Calcutta. Research Bull.1: .

Das Gupta, (1965). Adoption of agricultural practices of Indian farmers. Dept. of Agri.,Govt. of W. Bengal, Calcutta, Research Bull.4: .

Desai, B.M., and Desai, M.P.(1968). New strategy of Agricultural Development in operation. A case study in Kaira district in Gujarat. Vallath Vidhyanagar, Agro Economic Research Centre, Sardar Patel University.

* Deway, R., and Humber, W.J.(1956). An introduction to Socio-Psycology. New York Mac.Millan Company.

Dhaliwal, A., and Sohal, T.S.(1965). Extension contactsin relation to adoption of Agricultural Practices and Socio Economical Status of Farmers. Indian J. Ext. Edn. 4: 58-62.

* Dimit, R.M. (1954). Diffussion and Adoption of Approved Farm Practices in 11 countries in South West Virgina. Iowa State Collu. Amer. Iowa.

Diraviyam, (1972). A study on the implementation of paddy crop yield competition in Madurai district with special reference to East Block. M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore.

Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Co-operation. Govt. of India (1967). Report on the H.Y.V.S. programme studies in Eight district, 1966-1967, New Delhi.

Dixit, R.S., and Singh, S.B.(1969). Standard of living in relation to caste and Education. Rural India 32: 34-36.

English, H.B., and English, A.C.(1958). A comprehensive Dictionary of Psychological and Psycho-Analytical term. Congman Green and Co. New York.

Gross, N.(1949). The differential characteristics of acceptors and non-acceptors of an improved Agricultural Technological practices. Rural Sociology. 14(2): 148-156.

Gupta, D.P., (1967). The High Yielding varieties Programme 1966-67. A study in District of Aligarh. Agro-Economic Research Centre, Delhi University.

Gupta, D.P.(1968). Evaluation of H.Y.Vs. Programme - Rabi 1967-68. A study of Mexican Wheat in Saharanpur District in U.P. Agro-Economic Research Centre, Delhi, University.

Jaiswal, N.K., Singh, N.N., and Singh, B.N.(1971). A study of interactional association of selected factors with innovativeness in Farming. Indian J. Ext.Edn. 7:110-116.

Jalihal, (1960). Some implication of the Sociological Research on Diffusion and Adoption of Farm Practices to Other Application to Extension Education. Unpublished M.Sc.(Ag.) Thesis. Univ. of Tennessee, U.S.A.

Jha, P.N., and Singh, B.N.(1966). Utilization of Farm Informations related to characteristics of Farmers. Indian J. Ext. Edn. 1(4): 294-301.

John Knight, A., and Singh, K.N.(1975). Study on personal and Social characteristics of Farm Broad Cast Listners that are Associated with Gain in knowledge. Madras agric J. 62 (10-12): 698-701.

Kadam, K.R.(1969). The Farmers and Hybrid Jower cultivation. Rural India 32: 102-105.

Kamalsen,P.S.(1971). A study on the effectiveness of one day Farmers Training Camp under H.Y.Vs. programme in Trivandrum district of Kerala State. M.Sc.(Ag.) Thesis Coimbatore, Tamil Nadu Agricultural University.

Kolte, V.R. (1970). Factors related to knowledge of Package of practices and their adoption by Hybrid Jowar Growers. M.Sc.(Ag.) Thesis (Unpublished) P.K.V. Akola.

Krech, D., Crutchfield, R.S., and Ballachery, E.L. (1962). " Individual in Society " McGraw Hill Book Co., New York.

Lionberger, H.F.(1952). Diffusion of Farm and Home Information as an Area of Social Research. Rural Sociology 17: 132-144.

* Lionberger, H.F. and Coughenour, C.M.(1957). Social structure and diffusion of Farm Information. Columbia Missouri Agrl. Exp. Stn. Bull. 631.

* Marsh, P.C., and Coleman, (1954). Communication and the Adoption of Recommended Farm Practice Progress Report 22. Agrl. Ext. Stn. Univ. of Ketucky, Wexington.

Mohammed Hussain, M.(1971). A study on Selected Extension Methods in Relation to Influence on 14 Package of Practices of IR-8 paddy in Nedumangad Block of Trivandrum district. M.Sc.(Ag.) Thesis,Coimbatore, Tamil Nadu Agrl. University.

Mohamed Javeed Basha, A.W. (1975). A critical study of the Innovativeness of Farmers Associated with Adaptive Research Trials. Madras agric. J. 62 (10-12):717-720.

Misra, B., Das Gupta, H.K., and Misra, (1974). Possibilities of Capital formation in an agriculture. Ind. J. Economics 20: 209-211.

Pandit, S.(1964). Study of the Role of Age, Education and size of Farm in Relation to Adoption of improved Agricultural practices. Res.Foundation Bull. B.A.C. Sabour 6: 69-70.

Parameswaran, K.A.(1973). A study on the Impact of the Cotton Package programme on the Adoption of Improved Farm Practices by the Farmers of Madukkari Block. M.Sc.(Ag) Thesis, Tamil Nadu Agrl. University, Coimbatore.

Perumal, G., and Duraiswamy. (1972). Influence of personal and situational characters on the Adoptionof Hybrid Maize Cultivation by Farmers of Coimbatore district. Madras agric.J. 58(4): 209-213.

Rajagopalan, C., and Jaspal Singh, (1967). Adoption of Agricultural Innovation. Dept.of Humanities Social Science, I.I.T. New Delhi.

Rahim, S.A.(1961). The Diffusion and Adoption of Agricultural Practices. Quoted by Javeed Basha et al. (1975). Madras agric.J.62 (10-12): 720.

Rajendra, K. (1966). Adoption of Improved Farm Practices and Caste system. Indian J. Ext. Edn. 4: 99-10.

Rajendra, K.(1968). Distance concept in Adoption Pattern. Indian J. Ext. Edn. 4: (1 and 2): 83-88.

Rai, H.N., (1967). Diffusion of Information and Farmers Response to an Improved Farm Practices. Res. Foundation Bull. B.A.C. Sabour Vol. 8 and 9: 116-118.

Rai, M.N.(1965). Diffusion of Informationand Farmers Response in relation to any improved farm practice. Indian J. Ext. Edn. 1: 140-143.

Ramamurthy, S.K.(1973). A study of the Factors Influencing the use of NPK Complex Fertilizers by Farmers in Poonamalle Block of Chingliput district in Tamil Nadu. M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore.

Ramsey, C.H., Polson, R.A., and Spencer, G.H.(1959). Values and adoption of practices. Rural Sociology 24: .

Ranjit Singh, and Sohal, T.S.(1967). Size of holdings as related to acceptance of crop plans, Extension contacts and Education of the Farmers. Indian J. Ext. Edn. 4 (1&2): 45-48.

Ratanchand, and Gupta, M.L.(1966). A study of the Adoption of Improved Farm practices and their characteristics. Indian J. Ext.Edn. 4 (3&4): 259-265.

Reddy, M.S.K. (1962). A study of Adoption of Improved Agricultural practice on a function of some Socio-Economic factors and sources of Information. M.Sc.(Ag.) Thesis Division of Agrl. Extension. I.A.R.I., New Delhi.

Rogers, E.M.(1962). Diffusion of Innovation. Free Press, New York.

Rogers, E.M., and Capener, (1960). The country Extension Agent Research Bull. 858. Ohio.Agril Extn.Stn. Woosterohio.

Rogers, E.M., and Rover.J. Burdge (1962). Community Norms, Opinion Leadership and Innovativeness Among Growers. Wooster Ohio. Agril.Exp.Stn.Res. Bull.

Roy, P. et al. (1958). Agricultural Innovations among Indian Farmers, National Institute of Community Development Hyderabad 30.

Ryan, B., and Gross, N.(1950). Acceptance and Diffusion of Hybrid Seed Corn in Two Iowa Communities. Ames.Iowa. Agrl. Exp. Stn. Res. Bull. 372.

Sangle.(1962). Knowledge and Acceptance of Recommended Farm Practices Among Small Cultivators. M.Sc.(Ag.) Thesis (Unpublished) College of Agriculture, Nagpur.

Sawhney, (1961). Diffusion and Acceptance of Innovation in Agriculture with special reference to Rural Leaders and Rural Youths, Ph.D. Thesis, P.G.School, I.A.R.I. New Delhi.

Shankariah. (1965). A study of Differential characteristics of vegetable and non-vegetable growers of Improvement Practices of Vegetable cultivation. M.Sc.(Ag.) Thesis (IARI) New Delhi.

Sharma, S.K., and Nair, G.T. (1974). A Multivariable study of Adoption of H.Y.V. of paddy. Indian J. Ext. Edn. 10: (1&2): 30-35.

Singh, (1966). Selected Factors affecting Innovativeness of Farmers. Review of Ext.Res. B.A.C. Sabour, Vol. 6: 14-17

Singh, K.N., and Choubey, C.L.(1974). Operational Farm size and differential Adoptionof H.Y.V.S. of wheat. Indian J. Ext. Edn. 10(1&2): 42-46.

Singh, A.J., Dhaliwal., Sohal, T.S.(1965). Extension contacts to Adoption of Agricultural Practices and Socio-Economic Station of Farmers. Indian J. Ext. Edn. 1: 58-62.

Skinner. (1952). Science of Human Behaviour. New York The Mac Millan Company.

Singh, S.N., Khan, A.R., Murthy, S., and Lokhande, M.P.(1965). A study of social values in relation to Farming. Indian J. Ext. Edn. 1: 113-118.

Singh, N.P., and Prasad, C.(1974). Communication behaviour and source crediblity perception of young farmers. Indian J. Ext. Edn. 10: 53-58.

Singh, K.M.P., and Singh, R.P.(1974) Impact of National Demonstration in the Adoption of H.Y.V. of wheat. Indian J. Ext.Edn. 10: 65-67.

Singh, S.N., and Singh, K.N.(1970). A multivariate Analysis of Adoption Behaviour of farmers. Indian J. Ext.Edn. 6: 39-44.

Sriballah, (1964). A study of Factors affecting the Adoption of Improved Implements in Development Block, Ajitmal, Etawh. M.Sc.(Ag.) Thesis. Govt. Agrl. College, Kanpur.

Subedar, (1968). A studyeof characteristics of Adoption of Improved Agricultural Practices in C.D. Block, Kalyanpur, M.Sc.(Ag.) Thesis, Govt. Agrl.College, Kanpur.

Subramaniyam, V.S., and Lakshmana, C.(1973). Impact of Socio-Economic Factors on the Adoption of Improvedent Farm Practice. Madras agric. J., 60(3): 187-191.

Subramaniyam, V.S., and Lakshmana, C.(1975). Extent of Contact of Extension Agency with the Farmers. Madras agric. J. 62(10-12): 655-658.

Subramaniyam, V.S., and Radhakrishnamenon, K.(1975). Differential characteristics of growers and non-growers of H.Y.Vs. Madras agric. J. 62(10-12): 712-716.

Sumatimulay, and Roy, G.L.(1965). Caste and Adoption of Improved Farm Practices. Indian J. Ext.Edn. 4: 70-72.

Sundraswamy, B. and Duraiswamy, K.N.(1975). Characteristics of Farmers in relation to Adoption of Recommended practices of Hybrid Sorghum. Madras agric.J. 62(10-12) 721-725.

Supe,S.V. (1969). Factors related to different Degree of Rationality on Decision Making among Farmers in Buldana district. Ph.D. Thesis, I.A.R.I., New Delhi, India.

Supe, S., and Salode, M.S.(1975). Impact of National Demonstration on knowledge and Adoption level of farmers participants. Indian J. Ext.Edn. 11(1&2) 36-38.

Thakur, R.S.(1966). An Analysis of Package Programme with Emphasis on Farm production plan. Rev. of Extn. Res. B.A.C., Sabour. 6: 21-23.

Tiwari, A.N.(1964). A study of characteristics of Adoption of Improved Agricultural practices in C.D. Block. Kalyanpur, M.Sc.(Ag.) Thesis, Govt. Agrl. College, Kanpur.

Travers, Robert, M.W. (1964). An Introduction to Educational Research. Second (Ed.). The Mac Millan Company, New York.

Tripathi, S.L.(1963). A studyof the factors Associated with the Adoption of Improved Agricultural Practices in C.D.Block. M.Sc.(Ag.) Thesis,Govt. Agrl. College, Kanpur.

Trivedi, G.(1963). Measurement Analysis of Socio-Economic Status of Rural Families. Ph.D. Thesis, New Delhi, India, I.A.R.I., Library.

Van Den Ban, A.W.(1957). Some characteristics of progressive Farmers in Netherland. Rural Sociology 22: No.1.

Verma, D.S.(1964). A study of Factors affecting the Adoption of Improved Seeds in C.D. Block Muzaffarnagar. M.Sc.(Ag.) Thesis, Govt. Agrl. College, Kanpur.

Yadava, I.D.R. (1964). A study of Factors associated with the Adoption of Improved seeds in C.D. Block. M.Sc.(Ag.) Thesis, Govt. Agrl. College, Kanpur.

Wilkening, E.A.(1952). Informal Leaders and Innovators in Farm Practices. Rural Sociology, 17: 272-275.

Wilson,M.C. and Gallup, G.(1955). Extension Teaching Methods. U.S.D.A. Extension Ser. Cir. 495, 195.

Wilson, M.C., and Jaccard, C.R.(1930). Factors affecting the Adoption of wheat practices, Co-operative extension work in Agricultural and Home Economics. Cir. 163, U.S.D.A.

Ziaul Karim, A.S.M., and Mahboob, S.G.(1974). Relationship of selected characteristics of transplanted Aman Rice growers in their Adoption of Fertilizers in a rural area in Bangledesh. Indian J. Ext.Edn.10(1&2): 16-22.

Zeaudeen, P., and Srinivasan, M.(1974). A study of some Socio-Economic factors influencing the Adoption of Technological change in Agriculture. Madras agric. J., 61(7): 193-195.

Zeaudeen, P. and Srinivasan, M.(1977). Relative effectiveness of information sources in the Adoption of a technological changes and rate of Diffusion of technological changes in Agriculture. Madras agric. J., 64(7): 471-474.

APPENDIX

Appendix I

IMPACT OF INTENSIVE PADDY DEVELOPMENT PROGRAMME IN KERALA STATE.

Department of Agricultural Extension, College of Agriculture, Vellayani.

Sl.No..... Date..... Respondent No.....

Name of the farmer: . . . . . .

Address: . . . .

. . . . . .

. . . . . .

IPD unit area/ Non IPD unit area.

Village . . . . . .

Age . . . . . .

Caste . . . . . .

Education: Illiterate

Can read only

Primary

Secondary

Collegiate.

Farm size (Ha) a. Main . . . . . .

b. Subsidiary . . . . . .

Net Annual income: a. From Farming . . . . . .

b. From other sources: . . . . . .

TOTAL

Social participation

Organization	Member	Office bearer specify
a. Panchayat		
b. Co-operative		
c. Farmers' organisation		
d. Others (specify)		

Have you heard about H.Y.V. of paddy ? Yes/No

When did you actually come to know about the H.Y.Vs.? Year.. 1974

When did you actually start cultivating these H.Y.Vs. since. . . . . .

Are you cultivating the H.Y.Vs. continuously since then ? Yes/No

If 'Yes' specify the varieties: i. . . . . .

ii. . . . . .

iii. . . . . .

What are the recommended package of practices known to to you for H.Y.Vs. of Paddy?.

Seed rate No knowledge/Full knowledge

Manures and manuring

a. For medium duration variety. No knowledge/Full knowledge

b. Short duration variety. No knowledge/Full knowledge

Plant Protection Methods.

a. Seed Treatment No knowledge/Full knowledge

b. Paddy blast No knowledge/Full knowledge

c. Bacterial Blight No knowledge/Full knowledge

d.Stem borer No knowledge/Full knowledge

e. Case Worm No knowledge/Full knowledge

f. Leaf roller No knowledge/Full knowledge

Water Management.

a. At the time of transplanting. No knowledge/Full knowledge

b. After transplanting. No knowledge/Full knowledge

c. 10 days before harvest No knowledge/Full knowledge

To What Extent the above practices are being adopted by you?

i. Variety. No adoption/partial/full adoption

ii. Seed rate. No adoption/partial/full adoption

iii. Manures and manuring.

a. Medium duration varieties. No adoption/partial/full adoption

b. Short duration varieties. No adoption/partial/full adoption

iv. Plant Protection Methods.

a. Seed treatment No adoption/partial/full adoption

b. Paddy blast No adoption/partial/full adoption

c. Bacterial blight No adoption/partial/full adoption

d. Stem borer No adoption/partial/full adoption

e. Case worm No adoption/partial/full adoption

f. Leaf roller No adoption/partial/full adoption

v. Water Management

a. At the time of transplanting No adoption/partial/full adoption

b. After transplanting. No adoption/partial/full adoption

c. 10 days before harvest. No adoption/partial/full adoption

Whom do you consult to obtain technical guidance?

a. J.A.O. Daily/Once in a week/Twice a month/ Once in a month/Rarely/Never.

Demonstrator. Daily/Once in a week/Twice a month/
Once in a month/Rarely/Never.

V.E.O. Daily/Once in a week/Twice a month/
Once in a month/Rarely/Never.

Do you participate in meetings organised by the IPD unit/Agricultural Department on paddy cultivation

Regularly/Rarely/When time permits/Never

If 'Yes' Name them: 1. . . . . .

2 . . . . . .

3 . . . . . .

Have you participated in the Training camps on Agriculture organised by IPD or Department of Agriculture or any other agencies.

Yes/No

	No.of times
If yes: i.As a participant:	.....
ii.As an organizer	.....

Have you made contribution in cash/Kind for the camp.

Have you participated in the result demonstration conducted by the IPD unit?. Yes/No

If 'YES'

No. of times	By laying out demonstration in my field	By participating in field days etc.	Any other (specify)

Are you aware of campaigns organised by IPD unit/ Department of Agriculture/Agricultural Organisation.

Yes/No

a. If yes name them: 1. . . . . .

2 . . . . . .

3 . . . . . .

b. Have you participated in these campaigns?

Yes/No

If 'YES' 1. By attending meeting, demonstrations

2. By working as a Volunteer

3. By donating Cash/Kind.

c. Have you adopted the practices popularised through these campaigns? Yes/No

If 'YES' name them: 1. . . . . .

2 . . . . . .

3 . . . . . .

Was there any harvest festival organised by the IPD/Dept. of Agri./Any other organisation. Yes/No

If 'YES' have you attend the same. Yes/No

If 'YES' name them: . . . . . .

. . . . . .

Constraints (Give Tickmark according to importance)

a. Marketing facilities — Most imp./Imp./ Undecided/ Less imp./ Least imp./.

b. Lack of credit facilities. — Most imp./ Imp./ Undecided/ Less imp./ Least imp./.

c. Lack of irrigation facilities. — Most imp/Imp./ Undecided/ Less imp./ Least imp./.

d. No support price for paddy. — Most imp./ Imp./ Undecided/ Less imp./ Least imp./.

e. Lack of input supply in time. — Most imp./ Imp./ Undecided/ Less imp./ Least imp./.

f. Labour consuming process (more care and attention) — Most imp./ Imp./ Undecided/ Less imp./ Least imp./.

g. No proper enthusiasm of extension personnel. Most imp./ Imp./ Undecided/ Less imp./ Least imp./.

Please give your suggestions for the improvement and successful functioning of the IPD unit:-

1 . . . . . .

2 . . . . . .

3 . . . . . .

A STUDY ON THE IMPACT OF INTENSIVE PADDY DEVELOPMENT PROGRAMME IN KERALA

F. M. HUMAYUN KALEEL

ABSTRACT OF THE THESIS

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TRIVANDRUM

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ABSTRACT

A study conducted in Trichur district, Kerala to study (1) the extent of adoption of improved agricultural practices, (2) the gain in knowledge about the subject matter and (3) the extent of participation in agricultural extension programmes by the farmers,due to the IPD programme, revealed that high adopters of improved agricultural practices were more in the IPD area than in the non IPD area. Out of the 7 variables selected to study the relationship with the above factors, contact with extension agencies, education, social participation and income had positive and significant relationship with adoption.

Respondents in the IPD area gained more knowledge about subject matter. Education and social participation had positive and significant influence on the gain in knowledge.

The extent of participation of farmers in the agricultural extension programmes was also more in the IPD area than non IPD area. Contact with extension agencies and education had positive and significant relationship with participation.

Among the dependent variables, adoption of agricultural practices was positively and significantly related to gain in knowledge and participation in agricultural extension

programmes. Gain in knowledge also had positive and significant relationship with participation.

Non-availability of inputs in time was ranked first by the farmers as the most important constraints followed by lack of irrigation facilities, lack of credit facilities, high labour consumption, lack of support price for paddy, lack of adequate marketing facilities and inadequate support from extension personnel, in that order.