

INVOLVEMENT OF FARMERS IN AGRO-FORESTRY PROGRAMME IN KERALA – A CRITICAL ANALYSIS

By
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1988

DECLARATION

I hereby declare that this thesis, entitled "INVOLVEMENT OF FARMERS IN AGRO-FORESTRY PROGRAMME IN KERALA - A CRITICAL ANALYSIS" 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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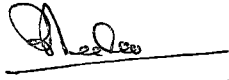
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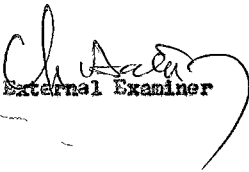
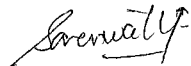
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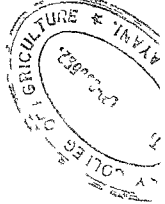
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INTRODUCTION

CHAPTER I

INTRODUCTION

Kerala ~~was~~ a State known for its beauty of vegetation and forests, which gave Kerala a green colour in the map of India. Three-fourth of the geographical area of Kerala was covered by forest about four decades ago. But, now the area covered by forest is only nine per cent. According to National Remote Sensing Agency, a decade since 1972, we lost forest area of about 13 lakh hectare annually. This phenomenon is confined not only to India, but also to the whole world. Cultivable land is slowly being converted into deserts. For any country it is stipulated that a minimum of one-third of its geographical area should be under forests. Forests control the economy of the State in many ways. It gives employment, food, fuel etc. to the people.

In India, and especially in Kerala the stipulated minimum forest area does not exist, though it is essential for socio-economic and ecological reasons. This condition necessitated and developed the terms like Social Forestry and Agro-forestry. This is a practice of planting trees in public places and also in and around the agricultural field with people's participation. Social Forestry has

become such a subject that now every where, every body, whether he be a forester, an environmentalist, a rural development man, or a public man has started talking about it. Social Forestry has acquired different connotations in different places. The concept of Social Forestry is a changing one not only from place to place but from time to time. Tiwari (1983) found that probably for the first time the word Social Forestry was used by the Forestry Scientist 'Westoby', who gave some lectures in the Ninth Common-wealth Forestry Congress during 1968 in Delhi. According to him, "Social Forestry is forestry which aims at producing flow of protection and recreation benefits" for the community.

Concept of Social Forestry

Social Forestry is the practice of forestry on lands outside the conventional forest area for the benefit of the rural and urban communities. Supply of fuel, food, small timber for rural housing and agricultural implements, fodder for the cattle of the rural population living far away from the forest areas, protection of agriculture by creation of diverse ecosystem and arresting wind and water erosion, and creation of recreational forests for the benefits of the rural as well as the urban population are the basic economic and cultural needs of the community without which there can

be no improvement in technology. This social objective is achieved by the concept of Social Forestry. This is a new concept recently added to forestry and includes within its scope the following.

Agro-forestry is the practice of forestry on farms in the form of raising rows of trees on bunds or boundaries of field and individual trees in private agriculture land as well as creation of wind breaks, which are protective vegetal screens created round a farm or an orchard by raising one or two lines of trees fairly close with shrubs in between.

Extension forestry is the practice of forestry in areas devoid of tree growth and other vegetation and situated in places away from the conventional forest areas with the objective of increasing the areas under tree growth. Linear strip plantations comes under this.

Degraded forests are those areas where forests have been destroyed either by human agencies or by biotic factors. Such areas are taken for plantation with suitable species and the area are well fenced according to the suitability of different type of fencing.

Recreational forestry is the practice of forestry with the object of raising flowering trees and shrubs mainly

to serve as recreation forests for the urban and rural population. The main objects are not to produce timber grass or leaf fodder but to raise ornamental trees and shrubs in some areas to meet the recreational needs of the people.

Instead of Social Forestry as a whole, Agro-forestry was selected for this study because except Agro-forestry component, Social Forestry still remains mainly a Government programme. The planting of wood lots or strips in or around villages is being done at government expense and patronage. The plans are prepared by Government agencies. Protection and fencing was also a Government concern.

Under Agro-forestry programme seedlings are distributed to farmers by the Social Forestry Department freely to plant in their own households.

Plan-wise Progress of Social Forestry

During successive five year plans, provisions were made for growing forests near villages and along road sides and canal sides with the objective of ameliorating the situation.

The programme was modest until the fourth plan. But during Fifth plan period and subsequent period, there has

been a substantial increase in the rate of planting. It could also be seen that the average expenditure per hectare of plantation was about Rs.100/- per hectare in the First Five year plan which rose to about Rs.200/- per hectare during 1979-80. This was done apart from the rising cost of labour and material to the adoption of more standard techniques including better protective measures.

Role of foreign aid agencies:

An important step taken during 1979-80 and in the Sixth plan period was the formulation and implementation of Social Forestry schemes through foreign agencies like the World Bank, International Development Authority, United States Agency for International Development, Canadian International Development Authority. Governments of Uttar Pradesh and Gujarat first formulated schemes for obtaining loans from the World Bank.

Foreign agencies provide aid upto 50 to 70 per cent of the estimated expenditure. Once the project is sanctioned, State Governments are committed to find the initial funds. Also it is easier under foreign aided projects to arrange for training personnel at various international institutions and participation in Seminars, Workshops etc. Social Forestry is by now an international movement and several foreign agencies

are at work in various developing countries. Interaction between our workers and those involved in similar activity in other countries is an experience that helps in better evaluation and adoption of improved methods. The aid agencies have also insisted on proper monitoring of the programme. A practical monitoring system has been developed which is being incorporated in a manual laying down standard procedures. This will help in timely corrective measures when they are needed.

Need for the study

Agro-forestry and Social Forestry programmes will be successful only with participation of public especially the farming community. Government is spending lakhs of rupees in the projects at the expense of other developmental programmes. Social Forestry still remains mainly a Government programme. The planting of wood lots or strips in or around villages is being done at Governmental expense and patronage. The plans are prepared by Governmental agencies, protection and fencing are also a Government concern. Naturally the involvement of farmers is nil. In this circumstance in order to get more participation of farmers the programmes like Agro-forestry and farm forestry have been started. Under these, the seedlings of tree plants are distributed freely

to farmers to plant in their own field. Protection and maintenance are their concern.

The Agro-forestry programme in Kerala has been started only three-four years back. Now it became necessary to know to what extent the farmers are involving in the Agro-forestry programme. Has the programme give the intended results?

In this study an attempt has been made to study nature and extent of involvement of farmers in Agro-forestry programme. Moreover an analysis of attitude of farmers towards Agro-forestry programme and motivational pattern of farmers participating in the Agro-forestry programme is also attempted which is expected to give a clear picture on Agro-forestry programme.

Only very few comprehensive studies have so far been conducted in the socio-economic context of Kerala and elsewhere to see to what extent the farmers are involved in the Agro-forestry programmes. Therefore, it is expected that the results of the study would help to streamline the future changes and alterations in strategies of Agro-forestry programmes for farmers in Kerala State.

Objectives of the study

This study has been undertaken with the following

specific objectives.

1. To assess the nature and extent of involvement of farmers in Agro-forestry programme in Kerala.
2. To study the attitude of farmers towards Agro-forestry programmes.
3. To study the motivational pattern of farmers for participation in Agro-forestry programme.
4. To identify the constraints perceived by the farmers and Agro-forestry personnel in the implementation of Agro-forestry programme.

Limitations of the study

The present study had the limitation of time and other resources, as it was undertaken as a part of the requirement for the M.Sc. (Ag.) programme. Hence it was not possible for the researcher to explore the area in greater depth and in a comprehensive manner. As the population of the study was restricted to the farmers of two Panchayats of Trichur and Wynad district, the findings of the present research have some limitations in making generalisation to whole state of Kerala. In spite of these limitations, it is expected that the findings of the present study would provide

a better insight into the problems and involvement of farmers in the Agro-forestry programme, which can help in its better implementation in the future.

Presentation of the study

The presentation of the remaining chapters of this report and contents of each chapter are as follows:

In Chapter two, which follows this chapter, theoretical orientation and review of selected variables are furnished. Chapter three deals with the methodology in which, details regarding sampling, data collection, empirical measures, definition of concepts etc. are given. The fourth chapter presents the results of the study in relation to the objectives and the interpretation of the findings and their discussion are presented. In Chapter five, a summary of the entire study emphasising salient findings is given.

THEORETICAL ORIENTATION

CHAPTER II

THEORETICAL ORIENTATION

The objective of this chapter is to discuss in broad outline the conceptual frame of reference used for this study. This serves as a basis in deciding the kind of variables to be included, kind of data to be collected and helps in summarising what is already known about the subject. The problem under investigation 'Agro-forestry' is a new concept in India and is only in the initial stage of development. Not much research work is done on Agro-forestry in the field of Social Science in accordance with the specific objectives. In this circumstance review of the studies on Agro-forestry presented is very limited.

This chapter is dealing with the specific problem and limited reviews of past studies. It is presented under the following headings.

1. Concepts of Agro-forestry and Social Forestry
2. Importance of Agro-forestry
3. Involvement of people in Agro-forestry and Social Forestry
4. Studies on the involvement of farmers in Agro-forestry programme

5. Selection of variables and relation between dependent and independent variables
6. Review on the constraints perceived by farmers in the adoption of improved agricultural practices

1. Concepts of Agro-forestry and Social Forestry

Social Forestry is the new concept of forestry for the development of society. Social Forestry has become such a subject that now every where, every body, whether he be a forester, an environmentalist, a rural development man, or a public man has started talking about it. Social Forestry has acquired different connotations in different places. The concept of Social Forestry is a changing one not only from place to place but from time to time. Tiwari (1983) found that probably for the first time the word Social Forestry was used by the forest scientist Westoby (1968) who gave some lectures in the Ninth Commonwealth Forestry Congress during 1968 in Delhi. He defined Social Forestry as "forestry which aims at producing flow of protection and recreation benefits for the community".

New concept of Social Forestry

Social Forestry is the practice of forestry on lands

outside the conventional forest area for the benefits of the rural and urban communities. Supply of fuel, food, small timber for rural housing and agricultural implements, fodder for the cattle of the rural population living far away from the forest areas, protection of agriculture by creation of diverse ecosystem and arresting wind and water erosion, and creation of recreational forests for the benefits of the rural as well as the urban population are the basic economic and cultural needs of the community without which there can be no improvement in technology. This social objective is achieved by the concept of Social Forestry.

This is a new concept recently added to forestry and includes within its scope the following.

Agro-forestry

Agro-forestry is the practice of forestry on farms in the form of raising rows of trees on bunds or boundaries of field and individual trees in private agriculture land as well as creation of wind breaks, which are protective vegetal screens created round a farm or an orchard by raising one or two lines of trees fairly close with shrubs in between.

Extension forestry

Extension forestry is the practice of forestry in

areas devoid of tree growth and other vegetation and situated in places away from the conventional forest areas with the object of increasing the areas under tree growth. Linear strip plantation comes under this category.

Reforestation of degraded forests

Degraded forests are those areas where forests have been destroyed either by human agencies or by biotic factors and such areas are taken for plantation with suitable species and the areas are well fenced according to suitability of the different types of fencing.

Recreational forestry

Recreational forestry is the practice of forestry with the object of raising flowering trees and shrubs mainly to serve as recreation forests for the urban and rural population. The main objects are not to produce timber, grass or leaf fodder but to raise ornamental trees and shrubs in some areas to meet the recreational needs of the people.

II. Importance of Agro-forestry

In Kerala the Agro-forestry programme is a part of Social Forestry programme of Kerala Forest Department. According to new 20 point programme of Government of India,

the Social Forestry mainly includes plantations raised in community lands, waste lands, marginal lands, road sides, canal sides and railway sides and also the plantations raised on degraded forests near habitations. Under Agro-forestry the seedlings are planted by farmers and others in and around the field, which are distributed freely to public through governmental agencies. This programme with the aid of World Bank was started in 1984. The objective of Agro-forestry programme is to provide the farmer fruit, fodder, fuel, wood and timber which will increase the income of the family without affecting the yield of other agricultural crops. According to Kerala Forest Department (1986), the tree species recommended for cultivation and the method of cultivation of Agro-forestry trees were recommended by a specialists committee composed of Director of Agriculture, Director of Research of Kerala Agricultural University, Director, C.P.C.R.I., Chief Conservator of Forests, Director, Kerala Forest Research Institute. They have recommended about 20 species of trees suitable for our State.

The seedlings are distributed by the Kerala Forest Department through voluntary organisations.

Involvement of people in Agro-forestry and Social Forestry

Except farm forestry, the other component of Social

Forestry still remain mainly a Governmental programme, the planting of wood lots or strips in or around villages being done at Government expense and patronage. The plans are prepared by Governmental agencies. Protection is also a Governmental concern. It is necessary that benefits of Social Forestry and Agro-forestry be made known to the people in time. One way to spread forestry consciousness amongst the masses would be to establish Vana Vigyan Kendras manned with forest extension workers in different regions of the country on the lines of Krishi Vigyan Kendras, already established to spread the knowledge of scientific agricultural practices. Groups of farmers could be invited for instruction, discussion and for visit to successful programmes. These could be short period programmes of a week or two.

Social Forestry and Agro-forestry - Target groups

Social Forestry need for its success the involvement of people at all levels. The following target groups could be considered separately. (1) Farmers, (2) Youth and school, (3) Leaders and politicians, (4) Village panchayats, (5) Voluntary organisations, (6) Industries.

The most important groups to be tackled are the

farmers themselves and the Panchayats. The farmers are generally aware of the value of trees but need a little encouragement by giving them opportunities to learn more about trees, their planting and use. Vana Vigyan Kendras can do a great service in this respect. In each gram panchayat when Social Forestry is being practiced a trained forestry extension worker is necessary. He has to be their friend, guide and philosopher. Forestry extension worker has to be carefully selected after ascertaining his aptitude for the type of work. A person belonging the locality should be preferred. The village panchayats have to be actively involved in matters of planting trees.

IV. Studies on the involvement of farmers in Agro-forestry and Social Forestry

Shiva et al. (1981) in his study of economic and ecological impact of Social Forestry observed that the Social Forestry practiced so far lacks the organisational and economic capabilities to provide the basic needs of rural people, although it has been successful in motivating the participation of individual farmers. New forest cover has emerged at the cost of food crops, and this change in land has worsened the conditions of both landless agricultural labourers and marginal farmers, in terms of employment

and availability of food, fodder, fuel and other forest products. The income of large farmers has gone up mainly because of large scale planting of eucalyptus which sells for high prices to the rayon and pulp industries but is said to be of little use as domestic fuel.

Manandhar et al. (1982) in studying the extension and training components of community forestry development in Nepal found that both the training itself and the communication aids provided have improved the competence, confidence and morale of the field staff implementing the community forestry development programme in Nepal.

While studying the role of women in Agro-forestry projects, Fortmann (1984) opined that it is essential that women participate in Agro-forestry projects and benefit from them. Project design must take into account women's access to land, labour and capital. He also pointed out that it is the intelligence, energy, initiative and labour of the women that will determine whether Agro-forestry and other tree projects work or not.

Davis (1985) stated that one of the major lessons of the project is that state agencies and private companies are not the only institutions with the capacity to develop

tropical forest resources. With the limited capital and adequate technical assistance, local indigenous communities can commercially develop their forestry resources, manage them on a sustained yield basis and contribute to national goals of social progress and rural development.

According to a study conducted in 1985 by Ministry of Agriculture, Peru, a good forestry extension worker has an educational role in the community and provides information on the possibilities and the alternatives offered by forestry activities. At the same time helps its members to define their respective needs so that they themselves will be able to decide on the most appropriate course of action.

Nair (1985) in his paper discussed the situation in Kerala, based on the findings of a recently concluded project which aimed to identify the main social and economic factors influencing homestead tree cropping. It was found that inspite of their known ecological stability home gardens are on the decline, mainly due to social and economic pressures. They are replaced by commercial farming, which in the long run is neither ecologically stable nor socially and economically desirable.

Rai (1985) conducted case studies in two villages

in Haryana to study the effects of tree planting. He concluded that tree planting benefitted the landless poor to some extent, by providing a few days employment per annum and supplying fallen branches for fuel.

Kuangpanit (1985) opined that participation of beneficiaries or the people in the local community is extremely important as, if they do not participate in the planning and implementation, the community forestry project will not satisfy individual and local needs, if they do not participate in receiving benefits. The project will have no meaning for them. To fulfil the objectives, emphasis should be on the integration of forestry and agriculture, including continued development of Agro-forestry system.

Sen et al. (1985) in his study on "peoples' participation in farm forestry: a case study in West Bengal" stated that the social forestry programme in West Bengal has created an impact due to its orientation around the weaker section of the rural community.

Chand and Singh (1986) revealed that the social forestry in Himachal Pradesh could not effectively mobilise people for participation due to limitations in the programme delivery and the response receiving system at the grass root level.

Keith (1986) pointed out that formal and informal education via school, the media and various organisation's extension schemes can encourage people to grow trees but the rural poor need financial security to risk the uncertain long term benefits. Economic incentives of profit may stimulate larger farmers to grow trees, but smaller farmers may require additional market support and credit schemes to give financial security before tree harvesting. When commercial tree growing is limited by lack of adequate market demand for wood, programmes rely on non-market incentives, based on social and environmental needs and promoted by education. When a strong market demand exists, programmes rely on individual profit as the primary motivating force, with encouragement from education and additional support measures.

Sen et al. (1986) stated that the forestry programme in Maharashtra was in its infancy, over all impressions led to the conclusion that general plantations were satisfactory, due largely to the enthusiasms of officials, but there was a lack of community involvement. Such lacunae resulted from the deficiencies with the Social Forestry officials in general and the base level funcionarios in particular with respect to their orientations towards the methodology of working with the people.

Selection of dependent and independent variables and review on inter-relation between the dependent and independent variables.

Dependent variables

- (1) Extent of involvement of farmers in Agro-forestry programme

Independent variables

- (1) Age
- (2) Education
- (3) Farm size
- (4) Income
- (5) Family size
- (6) Utilisation of information sources
- (7) Cosmopolitaness
- (8) Attitude of farmers towards agro-forestry programme
- (9) Motivational pattern of farmers for participation in Agro-forestry programme

As the review of relation of independent variables with extent of involvement was not available the review of relation with related terms like adoption and participation has been presented here.

Age

The importance of age of the farmer in the adoption of various improved practices needs no justification. In some studies, it was reported that age has a positive relation with adoption. Wilkening (1952), Anderson (1955) and Copp (1956) concluded that age of the operators was negatively associated with the attitude towards adoption of improved farm practices.

Lionbeger (1960) stated that elderly farmers seem to be some what less inclined to adopt new farm practices than young ones.

Chattopadhyaya (1960) stated that there was no definite association between levels of age and acceptance of practices.

Rahim (1961) and Bose and Saxena (1965) revealed that age had no relationship with adoption.

Bhasin (1966), Bhatia (1966), Rao (1966) and Singh (1966) have stated that age had no relation with adoption.

Roy (1967) stated the age had positive relationship with adoption.

Reddy and Kivlin (1958), Danda and Danda (1968) reported that age had no relationship with adoption.

As a result of the above reviews it was assumed that the age would be negatively associated with the involvement of farmers in Agro-forestry.

Education

Education is the process of producing the desired changes in the behaviour of people. Formal education helps an individual to know the world better and he is prone to seek for information which will increase his knowledge.

Bose (1960), Mahudkar (1962), Bhakshy (1962), Das Gupta (1963) have concluded that education had positive relationship with adoption.

Shetty (1966) and Varma (1966) did not support that education had positive influence on adoption.

Keith (1986) opined that formal and informal education via. school, the media and various organisations, extension schemes can encourage people to grow trees.

In the light of above reviews it was postulated that education could have a positive influence on extent of involvement of Agro-forestry programme.

Farm size

Farm size has consistently been shown to be highly and positively related with adoption behaviour. Bakshi (1952), Das Gupta (1963), Dhaliwal (1965), Mulay and Ray (1965), Mahajan (1966), Gupta (1966), Raja Gopal and Singh (1967), Choudhary (1967), Reddy and Kivlin (1968) reported in their studies that farm size had positive relationship with adoption.

Based on these reviews it was postulated that the farm size would have positive influence on the involvement of farmers in the Agro-forestry programme.

Income

Financial status of the farmer is an important component which has influence on behaviour. With more income, the financial status of the farmer was elevated as a result of which he is in a position to invest more money.

Lionberger (1960) and Jaiswal and Singh (1968) in their studies concluded that income had positive influence on adoption.

Oliver et al. studied the socio-economic factors and adoption and revealed that income had significant

influence on learning and adoption of practices.

Based on the above findings, it was postulated that income would have a positive influence on the involvement of farmers in Agro-forestry programme.

Family size

Salunkhe and Thorat (1975) reported that adoption behaviour of the farmers was related to their family size. According to them this might be due to the fact that larger the family, the more possible it was for the family to have members with diverse interest in the outside world. Based on the above finding, it was postulated that family size would have a positive influence on the involvement of farmers in Agro-forestry programme.

Utilization of information sources

Rai (1965) observed that adopters of new ideas had favourable attitude towards government programme and also said that greater the number of information sources sought, greater was the extent of adoption.

Lakshmana and Satyanarayana (1967) viewed that for effective agricultural development through the adoption of innovation of all sources of information like the governmental

agency and mass media have to be strengthened.

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

Padheria and Patel (1975) concluded that majority of the respondents sustained information about Improved Farm Practices of the selected crops from the village level workers and the most important source of information were neighbour and relatives.

Based on the above findings it was postulated that utilisation of information sources have positive influence on the involvement of farmers.

Cosmopoliteness

Many authors had pointed out that cosmopoliteness had positive influence on adoption.

A number of authors observed that cosmopoliteness had positive influence on adoption. Das Gupta (1963), Dhaliwal (1963), Patnaik (1963), Varma (1966) were observed that cosmopoliteness had positive influence on adoption.

Attitude of farmers towards Agro-forestry programme

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

Thurstone (1946) defined attitude as the degree of positive or negative affect associated with some psychological object towards which people can differ in varying degrees.

Krech and Crutchfield (1948) defined attitude as an enduring organisation of motivational, emotional, perceptual and cognitive processes with respect to some objects of an individual world. New Comb (1950) speaks of attitude as a state of readiness for motive arousal and an individual attitude towards something in his pre-disposition to perform, perceive, think and feel in relation to it.

Katz and Scotland (1959) defined attitude as a tendency or disposition to evaluate an object or symbol of the object in a certain way.

Kuppuswamy (1964) stated that attitudes are learned in the course of life experience which make the individuals

behave in characteristic ways towards persons, objects or issues to which they get related.

Dahama (1970) opined that attitudes are learned responses and that since they are always found in relation to objects, ideas and persons they play an important role in determining human behaviour.

Man possess attitude towards a wide range of phenomena. As Krech and Crutchfield (1948) had pointed out, it is the valence and degree of multiplicity of attitude that decide the influence of attitude on behaviour at a given point of time. When the attitude of a person is known, it is possible to indicate his probable reaction to certain stimuli.

Many researchers have established the positive and significant association of attitude with adoption of farm practices (Nair (1969), Singh and Singh (1971), Balasubramoniam (1977), Tripathy (1977), Pillai (1978), Mohanadasan (1979), Surendran (1982). Since detailed studies of attitude of farmers towards Agro-forestry were not available, this variable has been included in the present study.

Motivational pattern of farmers for participation in Agro-forestry programme

Not much studies were conducted on the motivational

patterns of farmers. Rehman and Menon (1978) while studying the motivational factors related to the participation of farmers in correspondence courses in agriculture found that 63.20 percent of participants in the age group between 15 and 35 years joined the correspondence course with security motive i.e. securing a job in the agricultural field on strength of the certificate of the course. But 36.80 per cent participants of age group 36 years and above joined the course with the self actualisation motive, i.e. to acquire more knowledge about paddy cultivation and thus mastery of the subject. In both the cases, educational background of participants had no significant role in motivation.

Raghudharan et al. (1976) while studying the motivational pattern of farmers in progressive and non progressive blocks revealed that in the progressive block prestige motive got first rank followed by patriotism, innovativeness, self actualisation. But in the case of non progressive block the first rank was assigned to family need followed by affiliation, self actualisation, economic security. This indicates that in the non progressive block farmers were motivated to grow the High Yielding varieties of rice only to meet their need, whereas the farmers in the progressive block were motivated to the same just for prestige. Motives

like family need, affiliation, self actualisation and economic security which received the first four ranks in the order in the non progressive block were ranked only as eighth, fifth, fourth and sixth respectively by the farmers in the progressive block. Farmers of progressive block were influenced more by motives concerned their status in the social system while those in the non progressive block were influenced by motives concerned with the security and well being of the families.

Review on constraints perceived by the farmers in the adoption of improved agricultural practices

Important problems perceived in the adoption of improved agricultural practices have been reported in many studies.

Sundaraswamy (1971) reported that lack of knowledge and lack of money were main constraints in the adoption of recommended farm practices.

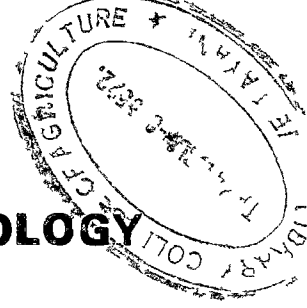
Ambalagan (1974) found that the major limiting factor for the adoption of paddy practices were lack of knowledge, non availability of inputs and high cost of cultivation.

Viswanathan (1975) in his study of impact of rice on small farmers revealed that the high cost of cultivation

was the main limiting factor in the adoption process.

Tripathy (1977) reported that institutional constraints leading to technological gap in the adoption of new rice technology were absence of liberal credit, high rates of interest, complicated procedures and unauthorised changes for getting credit as pointed out by farmers.

Waghmare and Pandit (1982) found that lack of knowledge, technical guidance and inputs and small size of holdings were the important constraints in the adoption of wheat technology.



METHODOLOGY

CHAPTER III

METHODOLOGY

This chapter deals with the methodology followed in this study and consists of following parts.

- I. Concept of Agro-forestry programme
- II. Selection of the Locale
- III. Sampling procedure and selection of respondents
- IV. Selection of variables and their measurement procedure
- V. Procedure followed for data collection
- VI. Statistical tools used for analysis

I. Concept of Agro-forestry programme

Agro-forestry is the practice of forestry on farms in the form of raising rows of trees on bunds or boundaries of field and individual trees in private agricultural land as well as creation of wind breaks, which are protective vegetal cover created round a farm or an orchard by raising one or two lines of trees fairly close with shrubs in between.

In Kerala, Agro-forestry is also a part of Social Forestry programme of Kerala Forest Department. The Social Forestry programme mainly includes plantations raised in community lands, waste lands, marginal lands, road sides,

canal sides and railway sides and also the plantations raised on degraded forests near habitations. Under Agro-forestry programme, the seedlings are planted by farmers and others in and around their field which are distributed to public through government agencies or from private nurseries. The programme with the aid of World Bank started in 1984.

In Kerala in different areas the cultivation of agricultural crops are different. This is due to different Agro-climatic and socio-economic conditions. So the species selected under Agro-forestry programme for each region is different. Farmers usually accept the trees which are suitable for the climate and planted with low investment, at the same time gives better income. This interest of farmers, availability of unsuitable land for cultivation of coconut, rubber etc. marketing possibility of tree species of Agro-forestry programme etc. were considered seriously while formulating the project. The species recommended for cultivation and the method of cultivation of Agro-forestry trees were recommended by a specialists committee comprised of Director of Agriculture, Director of Research of Kerala Agricultural University, Director, C.P.C.R.I., Chief Conservator of Forests, Director, Kerala Forest Research

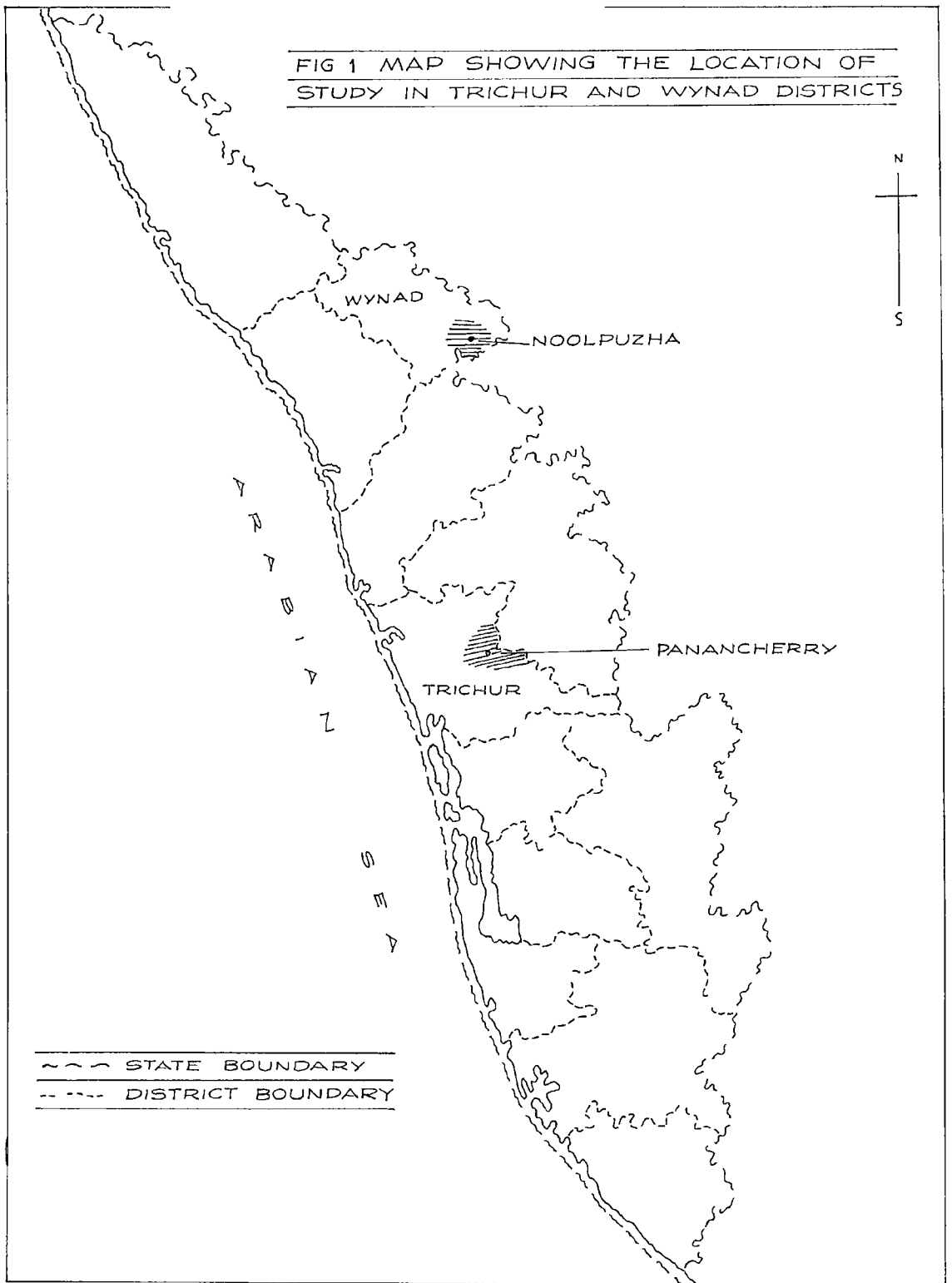
Institute. They have recommended about 20 species of trees suitable for our state. These trees can be planted in dry lands of private farms or in between the plantation and cash crops. The farmers usually accept the tree species like Motty, subabul, silver oak, acasia, casurina and fruit trees of different type.

II. Selection of the locale

Two districts of Kerala were selected for the study - the most benefitted district and the least benefitted district under Agro-forestry programme. The most benefitted district is one in which maximum number of tree seedlings are distributed and the least benefitted district is one in which least number of the seedlings are distributed.

Upto 1986-87, Trichur is the district in which maximum number of seedlings distributed. Wynad is the district in which least number of seedlings distributed. In Trichur a total of about 226 lakh seedlings were distributed, while in Wynad it was only 54 lakhs. From Trichur district the Range in which maximum number of seedlings are distributed was selected (Trichur Range). In Trichur Range, the total seedlings distributed was 98 lakhs. From this Range, the Panchayat in which maximum number of seedlings

FIG 1 MAP SHOWING THE LOCATION OF
STUDY IN TRICHUR AND WYNAD DISTRICTS



distributed was selected. (Panancherry Panchayat)

In Wynad district the range in which the least number of seedlings distributed was selected (Sultana Battery Range). The number of seedlings distributed was 12 lakh. From this Range the Panchayat in which the least number of seedlings distributed was selected. It was Noolpuzha Panchayat which had a total distribution of 1.5 lakh only.

The people in Wynad in general prefer to grow the Silver oak trees supplied under the Agro-forestry programme, because this is mainly used for growing pepper. At the same time people of Trichur showed interest in growing Watty, which is also used for growing pepper. Besides it can be cut and sold as wood after 10-15 years.

Panancherry Panchayat is situated in the eastern side of Trichur district bordering the Palghat district. Most of the people are small farmers having the average size of holding less than one acre, settled about 20-25 years ago from central Travancore. It is a hilly area having more area under forest. The distribution of the seedlings was mainly done by voluntary organisations, such as Vayanasalas and Mahila Samajams. The crops usually grown in the area are rubber, coconut, pepper, banana and rice in certain pockets.

Noolpuzha Panchayat of Wynad is situated in the eastern side of the Wynad district bordering the Karnataka State. About 20-25 per cent of the population are Tribals. The crops mainly grown are coffee, pepper, coconut and in certain pockets rubber. The major crops are coffee and pepper. People used to plant the Agro-forestry trees mainly to grow the pepper vines. Social Forestry Department conducts a special programme for the development of tribals in Wynad, which help them to raise nursery for the Agro-forestry trees.

Sampling procedure and selection of respondents

The present investigation was taken up in two districts the most benefitted district which was the district in which maximum number of seedlings were distributed and the least benefitted district in which the least number of seedlings were distributed under Agro-forestry programme in Kerala. As such Trichur and Wynad were respectively selected.

Trichur district consists of three Ranges of Social Forestry programme ie. Chalakkudy, Trichur and Nedakkancherry and from this, Trichur Range was selected because it was the Range in which maximum number of seedlings were distributed. From this Trichur Range, Panancherry Panchayat was selected which was the Panchayat having maximum distribution of seedlings.

Wynad district consists of three Ranges ie. Kalpetta, Sultans Battery and Manantody. Noolpuzha Panchayat in Sultans Battery Range in Wynad district was purposively selected in similar fashion.

Total respondents selected was hundred. Fifty respondents from Noolpuzha Panchayat of Wynad and fifty respondents from Panancherry Panchayat of Trichur were randomly selected from the list of farmers to whom Agro-forestry seedlings are distributed.

IV. Selection of variables and measurement procedure

Based on the specific objectives, review of past studies and pilot study conducted in the two Panchayats selected each in Trichur and Wynad district, the following variables were selected. The list of variable selected along with the instruments used to measure them are given below.

Variable	Method of measurement
<u>I. Dependent variable</u>	
(1) Extent of involvement of farmers in Agro-forestry programme.	Measured on a 3 point continuum. Measurement procedure was developed for this study.
<u>II. Independent variables</u>	
(1) Age	(1) Actual completed age in years at the time of interview
(2) Educational status	(2) Socio-economic status scale developed by Trivedi (1963)
(3) Farm size	(3) Scoring procedure developed for this study
(4) Income	(4) Scoring procedure developed for this study
(5) Family size	(5) The procedure used by Supe and Singh (1968)
(6) Utilisation of information sources	(6) Scoring procedure developed by Nair (1969)
(7) Cosmopolitaness	(7) Measurement procedure developed by Desai (1981)
(8) Attitude of farmers towards Agro-forestry programme	(8) Scale developed for the present study
(9) Motivational pattern of farmers	(9) Procedure developed for this study

Measurement of the dependent variable

Extent of involvement of farmers in Agro-forestry programme

Involvement in the present study was operationally defined as the extent of participation of farmers in Agro-forestry programmes.

In the present study in order to measure the extent of involvement of farmers in Agro-forestry programmes ten activities of the Agro-forestry programme were identified and the respondents were asked how frequently they performed the roles. The responses were rated on a three point scale always, sometimes and never, to which scores assigned were 2, 1, 0 respectively. The total score obtained by each farmer was calculated by summing up the score for each statement.

Measurement of independent variables

Based on the review of literature, pilot study and discussion with the experts, nine independent variables were selected for this study.

Age

Age was operationalised as the number of completed years of the farmer at the time of interview and the chronological age was taken as the measure. Age expressed in

completed years was taken as such.

Education

In this study education was operationalised as the number of years of formal education attained by the respondent at the time of interview. Education is measured by assigning scores for different levels of education as per the scoring system followed in the socio-economic status scale of Trivedi (1965). The categorisation of respondents and the corresponding scores assigned are given below.

<u>Category</u>	<u>Score</u>
Illiterate	0
Can read only	1
Can read and write	2
Primary School	3
Middle School	4
High School	5
Collegiate	6

Farm size

Farm size refers to the cultivable area in hectares possessed by the farmers. Different researchers have tried to measure farm size in different ways. Roy et al. (1968) chose value of agricultural products raised as measure of

farm size. In the present study farm size is defined as the number of hectares of land owned and cultivated by a respondent. The following procedure was used for the study.

<u>Area</u>	<u>Score</u>
Upto 1.00 ha	1
From 1.01 to 2.00 ha	2
From 2.01 to 3.00 ha	3
From 3.01 to 4.00 ha	4
From 4.01 to 5.00 ha	5
Above 5.00 ha	6

Income

Annual income of the respondent in terms of rupees from all the sources was considered as the income of the respondent. The farm source indicate the income obtained from the cultivation of land owned and the non farm sources indicate income from the collection of minor forest products, farm and non farm labour wages, dairy, poultry.

<u>Income</u>	<u>Score</u>
Upto 4000	1
4000 - 8000	2
8000 - 12000	3
12000 - 16000	4
Above 16000	5

Family size

Supre and Singh (1968) measured family size as follows.

<u>Family</u>	<u>Score</u>
Family having more than five members	2
Family having less than five members	1

In this study also the same procedure was followed.

Utilisation of information sources

In this study utilisation of information sources was operationally defined as the extent of use of different information sources by a farmer with a view to obtain information about Agro-forestry programmes. The sources of information were listed and they were grouped into three categories as (1) Mass media, (2) inter personal cosmopolite sources, (3) inter personal localite sources

The procedure followed by Nair (1969) was adopted in the present study to develop an index of use of information sources. Each respondent was asked to indicate as how often he got information regarding Agro-forestry programmes from each of the listed sources. The range of responses and the

scoring pattern is as follows.

<u>Item</u>	<u>Score</u>
1. Most often (once a week)	6
2. Often (once a fort-night)	4
3. Sometimes (once a month)	2
4. Rarely (once in an year)	1
5. Never	0

The scores were summed up across each item to form the index of use of information. The total scores for each of the three categories formed the index of information source use of farmer.

Sources of information

1. Mass media

- (a) Radio
- (b) Television
- (c) News paper
- (d) Periodicals

2. Interpersonal cosmopolite

- (a) Members of voluntary organisation
- (b) Village Extension Officers
- (c) Rangers
- (d) Foresters

3. Interpersonal localite

- (a) Friends
- (b) Neighbours
- (c) Relatives
- (d) Others

Cosmopolitaness

In the present study cosmopolitaness was operationally defined as the tendency of the farmer to be in contact with outside world based on the belief that all needs of an individual cannot be satisfied within his own village. This variable was measured using the scale developed by Desai (1981). The two dimensions of the variables are: (a) Frequency of visit to the nearest town in a month (b) purpose of visit to the town in a month

The scoring pattern was as follows

<u>Sl. No.</u>	<u>Frequency of visit</u>	<u>Scores assigned</u>
1.	Twice or more in a week	5
2.	Once a week	4
3.	Once a fort-night	3
4.	Once a month	2
5.	Very rarely (once in a year)	1
6.	Never	0

(b) Purpose of visit to the town in a month

<u>Sl. No.</u>	<u>Purpose of visit</u>	<u>Scores assigned</u>
1.	All visits related to Agro-forestry	5
2.	Some visits related to Agro-forestry	4
3.	Personal or domestic matters	3
4.	Entertainment	2
5.	Any other purpose	1
6.	No purpose	0

The total score of cosmopolitaness for each respondent was found out by adding the scores of the above two dimensions of cosmopolitaness. Based on the mean score, the respondents were classified into two groups as follows.

<u>Sl. No.</u>	<u>Level of cosmopolitaness</u>	<u>Score range</u>
1.	Low	Below mean score
2.	High	Above mean score

Attitude of farmers towards Agro-forestry programme

In this study attitude was operationalised as the farmers degree of favourableness or unfavourableness towards the psychological object.

Attitude provides the means of assessing the degree

of affect that individuals may associate with some psychological object. In this study attitude of farmers towards Agro-forestry programmes was measured by means of an attitude scale constructed for the purpose. Among the techniques available for constructing attitude scale, the method of equal appearing intervals by Thurstone and Chave (1929) and the method of summated ratings by Likert (1932) are quite well known.

Collection of attitude statements

Fifty eight attitude statements about Agro-forestry were initially collected from all possible sources and then edited for selection of items, comprising the attitude scale. The editing was done on the basis of the criteria suggested by Thurstone and Chave (1929), Likert (1932) and Edwards (1957). Out of fifty eight statements collected initially, twenty eight statements were selected after editing.

Judges ratings and calculation of scale and 'Q' values

The method of equal appearing intervals developed by Thurstone and Chave (1929) has been widely used in obtaining scale values for a large number of statements. As per the technique, all the twenty eight statements selected after editing were presented to a group of judges comprising

of extension specialists, teachers in post-graduate, departments of extension education and extension personnel in training departments. They were requested to sort these statements into various categories to represent a scale ranging from 'most favourable', through 'neutral' to 'most unfavourable' opinion about the issue. The judges were asked to rate each statement on a five point continuum in which one represented the most favourable expression, three neutral and five most unfavourable expression of opinion as suggested by Webb (1951). The Judges were asked to make sure that they do not express their opinion but their estimation of the degree of favourableness or unfavourableness expressed by each statement only. Out of fifty four judges, only forty six returned the statements after duly recording their judgements. Another six judges were eliminated on the criteria of Thurstone and Chave (1929) for carelessness in judging or otherwise failed to respond to the instructions sent for judgement. Thus finally the responses of forty judges were considered for calculation of the scale and 'Q' values of the attitude statements, which were worked out as per Thurstone and Chave (1929).

Final selection of attitude statements

For selection of the attitude statements to constitute

the final scale, the following criteria were used.

- (1) the statements should have smaller 'Q' values as far as possible. A low 'Q' value indicates that there is good agreement among the judges while a high 'Q' value indicates lack of agreement. The statements with the lowest 'Q' values are believed to be the least ambiguous.
- (2) the statements selected should represent the universe of opinions or content with respect to Agro-forestry.
- (3) the scale values should have equal appearing interval, i.e. distributed uniformly along the continuum.
- (4) there should be equal number of statements indicating favourable and unfavourable attitudes.

Based on these criteria, ten statements - five favourable and five unfavourable were selected to constitute the final scale.

Validity of the scale

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

(a) Content validity

This is a kind of validity by assumption (Guilford, 1956). The main criterion of the content validity is how well the contents of the scale represent the subject matter under study. This was ensured in the collection and selection of statements for the scale. Care was taken to include all possible statements which represent the universe of content.

(b) Construct validity

When validity of measuring instrument cannot be directly measured and certain other measuring instruments are needed to find out the validity of an instrument, the approach is known as construct validity.

This was tested by calculating the correlation coefficient between educational level scores and attitude scores of farmers. The educational level scores and attitude scores of twenty respondents were measured and the correlation between the two scores was calculated and found to be highly significant ($r = 0.809$). Hence it was concluded that the scale had construct validity.

Reliability of the scale

A test score is called reliable when we have reason

to believe the score to be stable and trustworthy. Guilford (1954) defined reliability as "the proportion of the variance in obtained test scores". A scale can be said to be reliable only when it will consistently produce produce the same results when applied to the sample at any time. The reliability of the attitude scale constructed for the present study was tested by split-half method.

Split-half method

Here, the scale administered to twenty respondents was divided into two halves based on odd - even numbers of statements. Two sets of scores were thus derived for the same group of respondents and the scores were correlated. The coefficient of correlation between the two sets of scores was found to be highly significant ($r = 0.984$). The reliability coefficient thus obtained indicated that the internal consistency of the attitude scale was quite high.

Administration

The responses of the statements were obtained in a three point continuum. The response categories and their corresponding scores for favourable statements were as follows.

<u>Response category</u>	<u>Scores</u>
Agree	3
Undecided	2
Disagree	1

In the case of unfavourable statements, the scoring was reversed. The scores obtained by each respondent for the ten statements were summated for obtaining his total score. The maximum score attainable by the respondent was thirty and minimum was ten. The neutral score was two for each item. Thus the neutral score for the ten statements was twenty. The respondents having the total score below twenty were considered as having negative attitude and above twenty as having a positive attitude towards the programme.

Motivational pattern of farmers for participation in Agro-forestry programme

In this study the motivational pattern of farmers was operationally defined as the degree of which a motive influences the farmer in the Agro-forestry programme.

The motivational pattern of farmers were studied by a procedure developed for this study. The important motives of the farmers in the participation of Agro-forestry were identified during pilot study. The important motives were presented to judges consisting of Department of Agricultural Extension, Department of Agriculture and also experts from the Forestry Department to judge the strength of the motives identified. Based on their opinion six important motives have been selected. Each motive was converted into statements.

These six statements one for each motive were given to respondents to rate them on a 'strongly agree to strongly disagree' a five point continuum.

	<u>Score</u>
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

The score obtained for each motive was recorded separately for each of the respondents. The mean score for each motive of the total respondents were calculated separately. Important motives for the participation of farmers in Agro-forestry programme were identified from the mean scores of motives.

Constraints perceived by the farmers and Agro-forestry personnel in the implementation of Agro-forestry programme

One objective of the study was to identify the problems or constraints perceived by the farmers and Agro-forestry personnel in the implementation of Agro-forestry programme. Based on the discussion with the Agro-forestry personnel and farmers and also through a review of relevant

literature, important problems faced by both the Agro-forestry personnel and farmers in the implementation of Agro-forestry programme were identified. The problems faced by the farmers and Agro-forestry personnel were included in separate lists which was presented separately to the Agro-forestry personnel and farmers to indicate the constraints perceived by him as most important among the identified constraints. The important constraints as perceived by the farmer and Agro-forestry personnel were identified by calculating the frequency percentage of each constraint indicated by the respondents as most important.

$$\text{Frequency percentage of constraint} = \frac{\text{The frequency obtained for a constraint}}{\text{Total number of respondents}} \times 100$$

Procedure followed for data collection

Prior to collection of data a clear idea about Agro-forestry programme and Social Forestry programme and relevant information regarding the study area was obtained by discussions with the officials of Social Forestry Department, scientists of Forest Research Institute and the farmers who are involved in the Agro-forestry programme.

The data were collected by interviewing respondents individually with the help of a interview schedule developed

by the researcher. The farmers were interviewed at their residence or in the field and the purpose of study was clearly explained to them. The data was collected during January-February 1988.

Statistical tools used for analysis

1. Large sample tests were applied to test for the significance of the difference between the sample means with respect to each character in the two districts.
2. Simple correlation: The sample correlation coefficients were computed to find out the relationship between the dependent variable and each of the independent variables.
3. Path analysis: Path analysis is applied to study the cause and effect relationship of the independent variables on dependent variable.

RESULTS AND DISCUSSION

RESULTS AND DISCUSSION

The results of the investigation derived in the light of the profixed objectives are given in this chapter under the following headings.

- I. A. Nature and extent of involvement of farmers in Agro-forestry programme
- B. Characteristics of farmers participating in Agro-forestry programme
- C. Correlation between the dependent variable and the independent variables - results of correlation analysis.
- D. The direct and indirect effects of the independent variable - results of path analysis.
- II. Attitude of farmer towards Agro-forestry programme
- III. Motivational pattern of farmers for their participation in Agro-forestry programme
- IV. Constraints perceived by farmers and Agro-forestry personnel in the implementation of Agro-forestry programme

I. A. Nature and extent of involvement of farmers in Agro-forestry programme

Table 1. Distribution of farmers according to their extent of involvement in Agro-forestry programme in Kerala.

Level of involvement	Trichur district (n=50)		Wynad district (n=50)		Total (n=100)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Low	10	20.00	15	26.00	19	19.00
Medium	33	66.00	29	58.00	67	67.00
High	7	14.00	8	16.00	14	14.00
	Mean score = 9.1 SD = 4.248		Mean score = 7.2 SD = 3.778		Mean score = 8.15 SD = 4.131	
	Z value = 2.36					

* Significant at 5 per cent level of probability SD = Standard Deviation

There is significant difference between farmers of Trichur and Wynad districts with respect to their mean involvement score at 5 per cent level.

As seen from table 1 majority of farmers (67 per cent) participating in Agro-forestry programme in Kerala belong to

group of medium level involvement. Nineteen per cent and fourteen per cent of farmers included in the groups of low level of involvement and high level of involvement respectively. In Trichur sixty six per cent of the farmers belong to group of medium level involvement. Twenty per cent and fourteen per cent included in the groups of low and high level of involvement respectively. But in Wynad district, fifty eight per cent of the farmers belong to the medium level involvement group. Twenty six per cent and sixteen per cent of farmers included in groups of low and high level of involvement respectively. There is significant difference between Trichur and Wynad districts with respect to their mean involvement score at five per cent level.

From this, it is observed that extent of involvement of majority farmers participating in the Agro-forestry programme is modium in Kerala. Percentage of farmers having 'higher level involvement' is comparatively less than the low level involvement of farmers. The Agro-forestry is a programme recently introduced in Kerala by Kerala Forest Department. This programme is only in the early stage of development.

Comparing the programme in two districts - Trichur and Wynad, there is a clear difference in the extent of

involvement. The 'low level of involvement' group is more in Wynad. There are obvious reasons for this. Wynad is considered as non-progressive backward district in Kerala. One reason is the low level of education of people. Literacy percentage of people are less in Wynad. The percentage of tribal population is about twenty in Wynad district. Most of the tribes are illiterate. Another feature is that unlike in Trichur district, the extent of involvement of farmers is negatively correlated with age in Wynad district. Age is one of the most important factors to be considered while studying the involvement of farmers. Lionberger (1960) stated that elderly farmers seems to be somewhat less inclined to adopt new farm practices than young ones. Utilisation of information sources is comparatively less in Wynad district. This also resulted in more number of farmers coming under the "low level involvement group" in Wynad district. 'Medium level involvement' group is less in Wynad district.

Mean score of involvement of farmers clearly reveals that there is significant difference between the extent of involvement of farmers in these two districts under the Agro-forestry programme. Low level of education can be one of the reasons for this.

Family size is comparatively large in Trichur. This

might be contributed to the higher level involvement of farmers in the Agro-forestry programme. Salunke and Thorat (1975) reported that adoption behaviour was positively related to their family size.

Climate of Trichur district is generally dry and rainfall is less when compared to Wynad district. So waste lands and uncultivated lands are available. So the farmers can use the waste lands and the lands unsuitable for cultivation for planting the Agro-forestry trees. Wynad is a backward district. But the climate is humid and cold. Most of the lands are used for cultivation. Agriculture is the primary occupation of the people. When compared to Trichur district the waste and uncultivated lands are less in Wynad district. So the people in general prefer to grow more agricultural crops than Agro-forestry trees, because they think this will bring more income to the people.

Utilisation of information sources is less in Wynad. Use of mass media is very less compared to Trichur district. Among the information sources the utilisation of interpersonal cosmopolite sources is also less. They mainly depend upon the interpersonal localite sources for getting information. This might be one of the reasons for less involvement of farmers in Agro-forestry programme in Wynad.

The mean involvement score of Kerala is 3.15. This reveals that on an average the extent involvement of farmers in Agro-forestry programme is comparatively low in Kerala. There are many reason for that. It seems that tree species is supplied under Agro-forestry programme were not attracted by the farmers. It is also observed by research workers that farmers were not interested in growing exotic tree varieties which does not give considerable income directly. Besides, the counter propaganda by certain organisations and individuals against certain species of trees supplied by Forest Department also creaces confusion among the farmers which may also contribute to the low level of involvement.

B. Characteristics of farmers involved in Agro-forestry programme

The distribution of respondents according to their characteristics are presented for each of the selected variables.

1. Age

Table 2. Distribution of farmers participating in Agro-forestry programme according to their age.

Age group	n = 100 Frequency	Percentage
Young (below 25)	19	19
Middle (25 - 54)	62	62
Old (above 54)	19	19

Mean = 39.5

SD = 14.144

As seen from the table 2 majority of farmers belonged to middle age group, constituting sixty two per cent. Nineteen per cent of the farmers included in young age group; same percentage (nineteen) of the farmers included in the old age group. The mean age of the farmers is 39.5.

Table 2 clearly reveals that majority of the farmers participating in the Agro-forestry programme belong to the middle age group. Young farmers and old farmers are less interested in this programme. For the old age group, the educational status is comparatively low. They are probably not aware of the programmes like Agro-forestry and Social Forestry. Utilisation of information sources and level of cosmopolitanness will be generally less in the case of old age group. Naturally they will be less involved in the programmes like Agro-forestry. Among the young farmers, level of education, knowledge, utilisation of information sources, level cosmopolitanness will be generally more. But it is a fact that majority of the young farmers below the age 25 are directed by the elders and they have to work according to instruction from the elders. These young people have no land of their own. The land will be allotted to them only after they become aged or some time after getting married by partition of the family properties.

Usually they have no role in the decision making process of the family. Another point is that young people have to attend school, college and involve in many activities and so they usually get less time for participating in the Agro-forestry programmes. So the young people in general are less involved in the Agro-forestry programmes.

2. Education

Table 3. Distribution of farmers involved in Agro-forestry programme according to their education.

Level of education	Frequency (n = 100)	Percentage
Low	25	25
Medium	62	62
High	13	13
Mean = 3.57		SD = 1.909

A glance at the data presented in table 3 reveals that majority of farmers (62 per cent) had medium level education, 25 per cent of the farmers included in the low education group and 13 per cent farmers included in the high education group.

The group of farmers having higher education generally

consider that the species of tree seedlings supplied by the Social Forestry Department in general are not suitable for planting in the field (example Acasia, Eucalyptus). They think that it will absorb the water available in the field and lower water table in the soil. Moreover there are criticisms by certain scientific and other organisations that certain trees can cause health hazards. Because of all these, farmers having higher education generally became more suspicious about this programme. So the involvement of farmers is less in the case higher education group.

The farmers having medium level of education generally do not consider the criticisms much. They are generally motivated by the economic returns the programme gives. Education generally helps in the adoption or involvement in a programme. Sundaraswamy (1971) revealed that education had positive relationship with adoption. So the majority of people having medium level of education had involved in the programme. The extent of involvement of farmers having low educational status is more than the farmers of the high education. Even though the education level is low they had contact with extension agencies, high level of utilisation of information sources, cosmopolitaness and positive attitude towards Agro-forestry programme. All

these contributed to the increased involvement of farmers having low educational status in Agro-forestry programme than higher education group. Moreover due to lack of education, these people may not consider the criticism against the programme from certain quarters. The involvement of this group of farmers in Agro-forestry is not motivated by understanding the concepts and objectives of Agro-forestry, but by the economic return it offers. Free supply of tree seedling under this programme was also an incentive for the increased involvement of farmers of low education group than higher education group.

3. Farm size

Table 4. Distribution of farmers involved in Agro-forestry programme according to their farm size.

Farm size	Frequency (n = 100)	Percentage
Small	63	63
Medium	25	25
Large	12	12
Mean = 1.55	SD = 0.852	

As evident from the table 4, majority of farmers participating in the programme belong to group of farmers

having small farms. Sixty three per cent of the farmers having small farm size. Twenty five per cent of the farmers had medium farm size, while only twelve per cent of farmers had large farm.

This table clearly reveals that the increase in the size of farm does not contribute to the increased involvement of farmers. Farmer having large farms generally do not prefer to grow the Agro-forestry trees because it will not give much income. The farmers will generally prefer to grow rubber, coconut or any other crop which will give better income. But in the case of farmers having small farm size they cannot grow the rubber or other plantation crops in large scale. They will grow the Agro-forestry trees as fence or in between the crops in the limited space without giving much attention to it. Moreover the Agro-forestry trees do not require much attention and after 5-10 years it will give a reasonable income to the small family.

Free supply of Agro-forestry seedlings by Forestry Department was also an incentive for increased involvement as the small farmers are generally poor. Due to the quick growth of seedlings adequate fuel wood is available to the household. This was also an incentive for the farmers having

small farms because they cannot collect the fuel wood from their land.

The percentage of farmers having medium farm size stands between the small and large farm size group. They usually grow the Agro-forestry trees as fence for protection from cattle and other animals.

The farmers having large farms generally think that this programme will not give income as they expects. Naturally the farmers who are financially sound, are not motivated by the free supply of Agro-forestry seedlings.

Patel and Singh (1970) and Subramaniyan and Lekshmana (1973) reported that farm size had positive and significant relation to the adoption behaviour. In the present study it was found that the farm size had negative relation with the involvement.

4. Income

Table 5. Distribution of farmers involved in Agro-forestry programme according to their level of annual income.

Level of income	Frequency (n = 100)	Percentage
Low	13	13
Medium	70	70
High	17	17

Mean Rs.11343/-

SD = 6115.005

An examination of the data in table 5 indicates that majority of farmers (seventy percentage) participating in Agro-forestry programme belonged to the medium income group and about 13 per cent, 17 per cent of the farmers belonged to the low and high income respectively.

Farmers of low income group generally are interested in getting more money so that they can reach better standards of life. Naturally they will not have much interest towards the programmes like Social Forestry and Agro-forestry and its objectives. The economic returns from the Agro-forestry programme will be comparatively less than the agricultural crops. So they are not much involved in Agro-forestry.

High income group is also not much involved in Agro-forestry programme. But comparing with low income group the involvement is more in high income group. But when comparing with medium income group the involvement is less in the case of high income group. The farmers of high income group are more concerned about the way they can increase more income. These farmers having high income had large sized farms. They think that if they plant Agro-forestry trees instead of growing rubber or coconut or any other agricultural crops, their economic returns will be reduced. So they are not generally interested in involving in Agro-forestry programmes. But in certain cases, if they grow

pepper vines they will use certain Agro-forestry trees like Katty or silver oak for growing pepper vines. So they involve in Agro-forestry programme to a certain extent that also in the interest of increasing their income.

The farmers having medium income had generally more education, utilisation of information sources, cosmopoliteness and positive attitude towards Agro-forestry programme than the farmers of low income. The medium income group is comparatively more progressive in thoughts and action than the high income group. So they involved in Agro-forestry programme to a greater extent than the other two income groups.

5. Family size

Table 6. Distribution of farmers involved in Agro-forestry programme according to their family size.

Size of family	Frequency (n = 100)	Percentage
Small	47	47
Large	53	53
Mean 1.53	SD = 0.4990	

A perusal of the data presented in the table 6

indicates that fifty three per cent of farmers included in the group of large family size. Forty seven per cent of farmers included in the group of small family size.

The number of members in a family do not have any significant relationship with the extent of involvement, the level of education, utilisation of information sources, cosmopolitaness and positive attitude towards Agro-forestry programme were more then naturally the involvement will be more. If not, the extent of involvement will be just reverse. This is not in agreement with findings of Salunkhe and Thorat (1975) who reported that adoption behaviour of the small farmers was significantly related to their family size.

6. Utilisation of information sources

Table 7. Distribution of farmers involved in the Agro-forestry programme according to the level of utilisation of information source.

Level of utilisation of information sources	Frequency (n = 100)	Percentage
Low	16	16
Medium	68	68
High	16	16
Mean score	43.41	SD = 16.16

An observation of the data in table 7 reveals that majority of farmers (68 per cent) included in the group of medium level utilisation of information sources. The percentage of farmers included in the low and high group is sixteen each.

The farmers having low level of utilisation of information will be generally low in level of education, cosmopolitaness and positive attitude towards Agro-forestry programme. Low level of utilisation information sources probably leads to low involvement of farmers, because the farmers are unaware of the programme and its objectives. It is believed that the major reason for the low level utilisation of information sources is illiteracy and low income. They usually depend on interpersonal localite sources for getting information. Most probably this information may not be correct and reliable. All these lead to low involvement of farmers in Agro-forestry programme.

The group of farmers having high level utilisation of information sources generally have good education, cosmopolitaness and higher income. But they are mainly interested in growing plants which will give better economic returns. Another important reason of low involvement is the severe criticism from certain quarters that the plants supplied

under this programme were not suitable for cultivation in the field and it may cause health hazards. As they had higher knowledge and access to information sources they were in a state of confusion, which results in low involvement.

But the farmer of medium group generally do not consider this criticisms much and comes to the conclusion that for every progressive movement there will be opposition from certain quarters. These farmers believe the publicity given by the Forestry Department, other Government publications and agencies. This group generally have more education, cosmopolitaness, income and positive attitude towards this programme, than the low group which results in more involvement in the programme than the low group.

7. Cosmopolitaness

Table 8. Distribution of farmers involved in the Agro-Forestry programme according to the level of cosmopolitaness.

Level of cosmopolitaness	Frequency (n = 100)	Percentage
Low	29	29
Medium	67	67
High	4	4
Mean 7.39	SD = 1.810	

The data presented in the table 8 clearly shows that majority of farmers participating in the programme had a medium level of cosmopolitaness (67%). Twenty nine per cent of the farmers had a low level of cosmopolitaness, while only four per cent had a high level of cosmopolitaness.

The level of cosmopolitaness may be less in the case of women and people above sixty. But their educational standards, income, utilisation of information sources and positive attitudes towards Agro-forestry programme may lead to involvement in the programme. When the level of cosmopolitaness is increased as in the case of medium group, involvement of farmers is also increased. Majority of the farmers have medium level cosmopolitaness. The number of farmers in the high cosmopolite group is less.

C. Correlation between the depended variable and the independent variables - Results of correlation analysis.

Relationship of the selected independent variables with the extent of involvement of farmers in the Agro-forestry programmes was worked out computing, coefficient of correlation. The results obtained are presented in table 9.

A close examination of the table 9 reveals that education, utilisation of information sources, cosmopolitaness

Table 9. Correlation between extent of involvement of farmers in agro-forestry programme and selected independent variables in Kerala.

(n = 100)

Sl. No.	Independent variables	Correlation coefficients
1.	Age	0.0823 ^{NS}
2.	Education	0.2719 [*]
3.	Farm size	0.1270 ^{NS}
4.	Income	0.0435 ^{NS}
5.	Family size	0.0633 ^{NS}
6.	Utilisation of information source	0.5356 [*]
7.	^{mo} A ⁿ Cospoliteness	0.2963 [*]
8.	Attitude of farmers towards Agro-forestry	0.4312 [*]

NS Not significant

* Significant at 5% level

and attitude of farmers towards the Agro-forestry were highly correlated with the involvement of farmers in the Agro-forestry programme at five per cent level.

Utilisation of information sources is very important as far as the involvement is concerned. When farmers are exposed to more information sources they will become more and more aware of the programme which can lead to positive attitude about the programme, which results in increased involvement of farmers. This is in agreement with the findings of Rao (1979). Higher the farmers are exposed to the information sources the possibility of higher cosmopolitanism will be there which in turn contribute to the greater extent of involvement. This finding is in agreement with the findings of Rai (1965), and Lakshmana and Satyanarayana (1967)

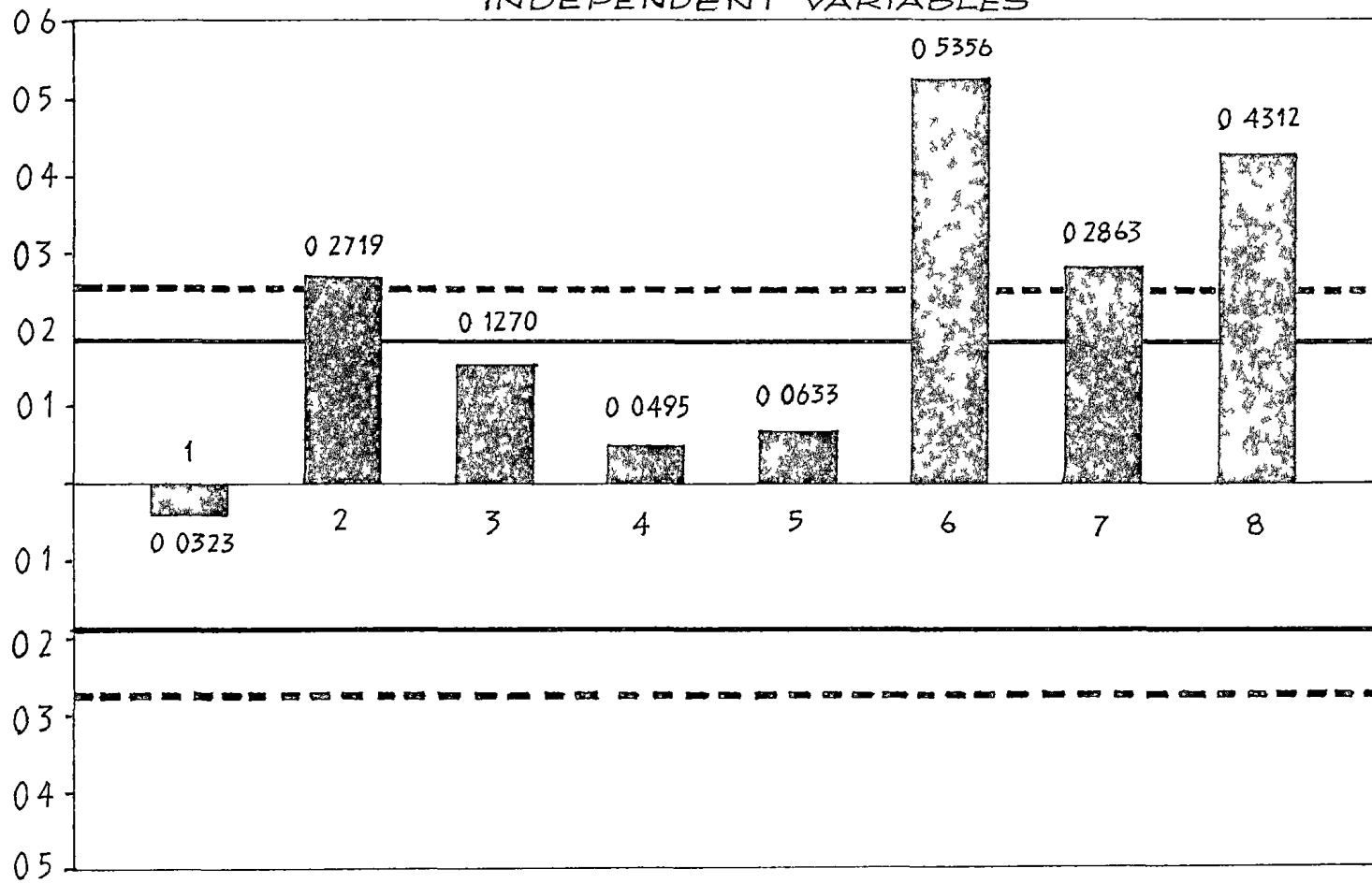
Attitude of farmers is significantly correlated with the involvement. The farmers having positive attitude will naturally results in their greater involvement. Many researchers have established the positive and significant association of attitude with the adoption of farm practices (Tripathy, 1977), Sinha (1978), Pillai (1978). Even though the farmers have high level of education, cosmopolitanism and utilisation of information sources etc., if there is

negative attitude there is possibility for low involvement.

Cosmopolitaness was significantly correlated with the extent of involvement in Agro-forestry programme. If the farmer had more contact with the outside world he would be more exposed to latest developmental programmes and agricultural innovations which will create a positive attitude towards the programme. This ultimately lead them to involve in the programme. So naturally the farmers with low cosmopolitaness will be low in the involvement also. Many researchers have established a positive and significant association of cosmopolitaness with adoption of farm practices (Das Gupta (1963), Dalwal (1963), Varma (1966), Kamarudeen (1981)).

The table clearly shows that education exhibited significant correlation with the involvement of farmers in Agro-forestry programme. This result was in conformity with the findings of many researchers (Kamble (1973), Prakash, R. (1980). Education helps in the utilisation of information sources. Education creates a positive attitude towards a programme. Education helps the farmer to know and analyse the merits and demerits of the programme. An

FIG 2 CORRELATION BETWEEN EXTENT OF INVOLVEMENT OF FARMERS IN AGRO-FORESTRY PROGRAMME AND SELECTED INDEPENDENT VARIABLES



—— 0.1967 - SIGNIFICANT AT 0.5 LEVEL

- - - - 0.2567 - SIGNIFICANT AT 0.01 LEVEL

1 - AGE, 2 - EDUCATION, 3 - FARM SIZE, 4 - INCOME

5 - FAMILY SIZE, 6 - UTILISATION OF INFORMATION SOURCES

7 - COSMOPOLITENESS, 8 - ATTITUDE OF FARMERS

educated farmer can understand the necessity of forest in our Country and how the concepts like Agro-forestry and Social Forestry came into being. An uneducated farmer has to depend mainly on interpersonal localite sources for getting information. The information he gets through this sources sometimes may be distorted. Education helps the farmers to utilise the print media.

It was evident that age was found to be negatively but not significantly correlated with the extent of involvement of farmers in Agro-forestry programmes. This is in agreement with the finding of Pillai (1978). The farmers as they grow old might loose enthusiasm to go out in search of information about the new programmes. Due to this the level of cosmopolitaness and positive attitude towards the programme will be reduced which in turn result in low involvement. It is quite often seen that young farmers show a higher degree of enthusiasm to acquire new knowledge and information regarding the Agro-forestry programme and positive attitude towards the programme.

Examination of the data presented in table 9 shows that there was no significant correlation between farm size and extent of involvement. The farmers having larger holdings do not have interest in involving in the Agro-forestry

programme since it will not bring much economic returns. Naturally he will go for planting other agricultural crops instead of Agro-forestry trees. Farmers are generally interested in getting immediate monetary benefits. Farmers will plant Agro-forestry seedlings in waste lands which cannot be used for normal cultivation. But this practice had no relation with the size of the farm. From the above discussion it is concluded that the size of the farm does not have any relation with the extent of involvement. This result was in conformity with the findings of Vijaya (1982). It was evident from the table 9 that there was no significant relationship between income of the farmers and extent of involvement. This finding is very encouraging in the light of the popular belief that a sound financial position characterises the farmers who are involved in the developmental programmes and agricultural innovations. On the contrary, the widening social chasm between the haves and have nots tends to deteriorate the advent of the application of modern technology for betterment in living conditions, as indicated by the results of the present study. In the light above discussion we can come to the conclusion that the income of the farmer do not characterise the extent of involvement in the Agro-forestry programme.

It is brought from the results of the study that

size of the family did not significantly influence the extent of involvement of farmers in Agro-forestry programme. Extent of involvement of farmers is influenced by the level of education, cosmopolitaness, utilisation of information sources and positive attitude towards the programme.

There is no reason to admit that either the number of members in ones family or the type of family would significantly influence the extent of involvement of farmers. Closely related studies contradicting or supporting this finding are not commonly met with. This is not in agreement with the finding of Salunkhe and Thorat (1975) who reported that adoption behaviour of small farmers was significantly related to their family size.

Comparison of correlation between extent of involvement of farmers and independent variables in Trichur and Wynaad districts.

A critical examination of the table 10 reveals that in Trichur district utilisation of information sources followed by attitude of farmers towards Agro-forestry programme had high correlation with the extent of involvement of farmer. Cosmopolitaness and education also got significant correlation with the extent involvement.

In Wynaad district utilisation of information sources followed by attitude of farmers towards Agro-forestry programme

and the age had significant correlation with involvement of farmers.

Table 10. Correlation between extent of involvement of farmers in Agro-forestry programme and selected independent variables in Trichur and Wynad districts.

(n = 50)

Sl. No.	Independent variables	Correlation coefficient	
		Trichur district	Wynad district
1.	Age	0.0128 ^{NS}	-0.3446 [*]
2.	Education	0.2962 [*]	0.2437 ^{NS}
3.	Farm size	0.2061 ^{NS}	-0.0145 ^{NS}
4.	Income	0.2039 ^{NS}	-0.0450 ^{NS}
5.	Family size	0.1440 ^{NS}	-0.0720 ^{NS}
6.	Utilisation of information sources	0.5099 [*]	0.5420 [*]
7.	Cosmopolitaness	0.3659 [*]	0.2491 ^{NS}
8.	Attitude of farmers towards Agro-forestry	0.4675 [*]	0.3786 [*]

NS Not significant

* Significant at 5% level

Age

In Trichur district as discussed earlier the education

level of farmers is more than the Wynad district. Education is an important factor influencing the involvement of farmers. Age is not a significant factor influencing the involvement. This clearly shows that if a farmer is educated he used to involve in developmental programmes like Agro-forestry irrespective of his age because he knows the merits of Agro-forestry. Here the age does not become an important factor. Wynad is a backward district with low literacy level. Naturally the young people will be more educated than old age group. The utilisation of the information sources and positive attitude towards the programme will be more in young farmers. As the age increases the utilisation of information sources, educational status and positive attitude towards the Agro-forestry programme etc. will be decreasing. It results in low involvement of farmers with respect to increase in age. From the above discussion it can be concluded that only in Wynad district age become a significant factor influencing the extent of involvement.

Education

Trichur is a progressive district in Kerala. The literacy percentage is very high in Trichur district. A couple of years back it was the district in India having the highest literacy percentage. Almost all professional

colleges and a number of arts and science colleges and schools are located in Trichur district. Naturally the farmers are more literate. So education had a significant correlation with the extent of involvement of farmers in Trichur district. Education creates a positive attitude and helps in acquiring more information and knowledge which in turn lead to the higher involvement. Wynad is a backward district with low literacy percentage. Number of educational institutions are less in Wynad district. Not even a single professional college is located in Wynad district. Twenty per cent of the population in Wynad district are tribes who's literacy rate is very very low. Though there is a correlation coefficient of 0.2437 education is not significantly correlated with the extent of involvement of farmers in Wynad district. From the above discussion it can be concluded that only in Trichur district, education had significant correlation with involvement.

Farm size

Table 10 clearly shows that both in Trichur and Wynad districts the farm size is not a significant factor influencing the involvement. But when comparing these two districts, Trichur has a slightly high correlation than the Wynad district. As discussed earlier in Trichur district the climate

is hot and dry comparing with Wynad. Lot of waste lands and lands unsuitable for cultivation can be seen in Trichur district. In Wynad agriculture is the most important occupation and no waste and dry land unsuitable for cultivation can be seen. So the farmers used to plant the Agro-forestry seedlings in field when the land is unsuitable for cultivation. When the size of unsuitable land increases the planting of Agro-forestry trees also increases. In Wynad farmers did not prefer to grow the Agro-forestry seedlings in their farm according to the increase in size of the farm. From the above proposition it can be concluded that though the farm size had no significant correlation with the extent of involvement of farmers, Trichur district has a slightly higher correlation than Wynad district.

Income

Data presented in the table 10 clearly indicates that income had no significant correlation with the extent of involvement both in Trichur district and Wynad district. The correlation of income with the extent of involvement of farmers is high in Trichur district than the Wynad district. In Trichur district besides agriculture, business, work in factories, white collar jobs etc. are the major occupation of the people. In Wynad agriculture is the most important occupation of majority of the people. They usually spend

less time for education when comparing with Trichur district. In Trichur, people go for higher education as their income increases; which may results in their positive attitude towards the developmental programmes like Agro-forestry. But in Wynad, though income of the people increases, they will be concentrating more on agriculture for increasing production because generally they think that they had nothing to do with the business and other type of white collar jobs after obtaining higher education. Naturally the farmers of Wynad becomes less educated, less cosmopolite and having negative attitude towards the Agro-forestry programme. From the above discussion it was concluded that income had a high correlation with extent of involvement in Trichur district than Wynad district, though in both districts income had no significant correlation with the extent of involvement.

Family size

In both the districts of Trichur and Wynad family size has got no significant correlation with the extent of involvement. This is not in agreement with the findings of Salunkhe and Thorat (1975) who reported that adoption behaviour of small farmers was significantly related to their family size.

Utilisation of information sources

The data presented in table 10 reveals that in both

districts utilisation of information sources had significant correlation with extent of involvement of farmers. If more the utilisation of information sources by the farmers, more will be cosmopolitaness and positive attitude towards the programme which results in higher involvement of farmers in the Agro-forestry programme. So it is concluded that when the farmers utilise more information sources more will be the involvement of farmers.

Cosmopolitaness

An examination of the table 10 clearly indicases that the variable 'cosmopolitaness' had significant correlation with the involvement of farmers in Trichur district. In Wynad district there is correlation but it is not significant. Trichur is a progressive district with a number of big and small towns with well developed communication and transport facilities. Here the farmers do not have to travel a long distance to the market. But in Wynad district the farmers have to travel long distances to the market and the transport system is also not much developed. This naturally influences the cosmopolitaness of the farmers. Naturally the farmers of Trichur had high cosmopolitaness and farmers of Wynad had less cosmopolitaness. When higher the cosmopolitaness, naturally there will be more chances for utilisation of information sources by the farmers and results in

the development of positive attitude towards the Agro-forestry programme which in turn results in higher involvement in the programme. On the contrary in Wynad district there is less cosmopolitaness. Though there is correlation with involvement it is not significant. From the above discussion it can be concluded that, in Trichur district the cosmopolitaness had significant correlation with the involvement and in Wynad the cosmopolitaness had no significant correlation with involvement.

Attitude towards Agro-forestry

A glance at the table 10 clearly indicates that both in Trichur and Wynad district the variable attitude of farmers towards Agro-forestry had significant correlation with involvement. Comparison of the correlation coefficient of two districts clearly shows that the correlation is more in Trichur district than the Wynad district.

Attitude of the farmers is influenced by many factors like age, education, utilisation of information sources, income etc. Farmers having higher education and utilisation of information sources are more in Trichur district which results high positive attitude towards the Agro-forestry. Positive attitude along with high education and utilisation of information sources helps in greater involvement of farmers.

In Wynad, though farmers had positive attitude, the low income, education, utilisation of information sources etc. which adversely affect farmers involvement in the Agro-forestry programme. From the above discussion it is concluded that though attitude has significant correlation with the involvement in both district the correlation is high in Trichur district.

D. Path analysis: Four independent variables were selected for studying the direct and indirect effect as these variables had significant correlation with the dependent variable.

Table 11. List of independent variables selected to study their direct and indirect effect on the extent of involvement of farmers in Agro-forestry programme.

Sl. No.	Variable No.	Name of variable
1	X ₂	Education
2	X ₆	Utilisation of information source
3	X ₇	Cosmopolitaness
4	X ₉	Attitude of farmers

Table 12. Direct and indirect effect of independent variables on the dependent variable.

	X_1	X_2	X_3	X_4
X_1	<u>0.07549</u>	0.19273	0.04411	0.04043
X_2	0.03593	<u>0.42877</u>	0.03369	0.03920
X_3	0.03423	0.14853	<u>0.09726</u>	0.00628
X_4	0.00773	0.04258	0.00155	<u>0.39481</u>

Residue = 0.7427906

X_1 = education

X_2 = utilisation of information sources

X_3 = cosmopolitaness

X_4 = attitude of farmers towards Agro-forestry programme

A glance at the table 12 and 13 shows that utilisation of information sources had the maximum direct effect (0.42877) on the extent of involvement of farmers followed by attitude of farmers towards Agro-forestry programme (0.39481). The direct effect of the variables education and cosmopolitaness were comparatively less (0.07549 and 0.09726 respectively). The total indirect through other variables was maximum for the variable education (0.19641)

Table 13. Results of path analysis - Substantial effects of independent variables on the extent involvement of farmers in Agro-forestry programme in Kerala.

Variable No.	Name of variable	Direct effect	Total indirect effect	Substantial effects through crucial variables according to the rank		
				First	Second	Third
X ₂	Education	0.07549	0.19641	0.19273(X ₆)	0.04411(X ₇)	-0.04043(X ₉)
X ₆	Utilisation of information sources	0.42877	0.10632	0.03920(X ₉)	0.03393(X ₂)	0.03369(X ₇)
X ₇	Cosmopolite-ness	0.09726	0.18904	0.14853(X ₆)	0.03423(X ₂)	0.00628(X ₉)
X ₉	Attitude of farmers towards Agro-forestry programme	0.39481	0.0364	0.4258(X ₆)	0.00155(X ₇)	-0.00773(X ₂)

Residue = 0.742790

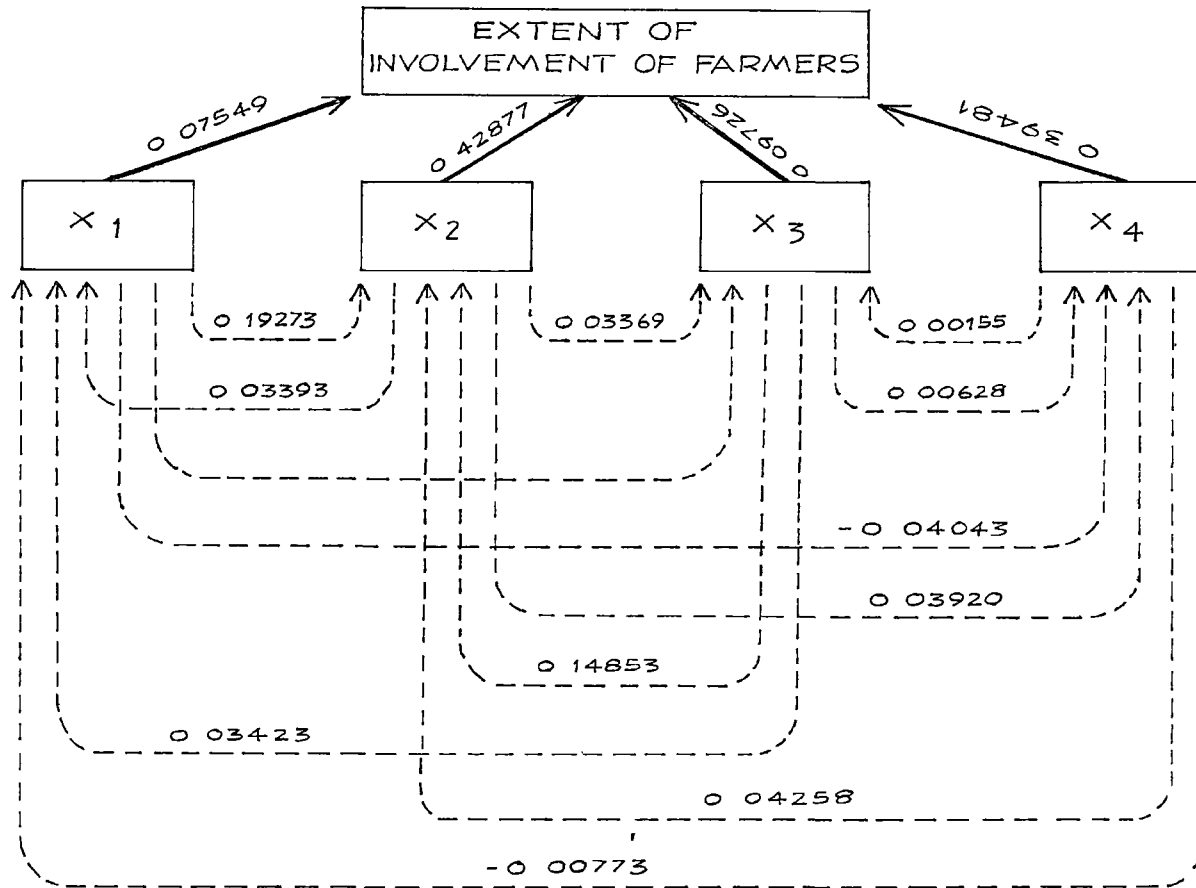
followed by cosmopolitaness (0.18904). In both cases the indirect effect was higher than direct effect.

Among the total indirect effect of education the indirect effect through variable utilisation of information of information sources is 0.19273. The indirect effect of the variable education on involvement of farmers through the variable cosmopolitaness and attitude of farmers towards Agro-forestry programmes were negligible (0.04411 and 0.04043 respectively).

The total indirect effect of the variable utilisation of information sources through other independent variables on the dependent variable extent of involvement of farmers in Agro-forestry programme was 0.10682. Among these independent variables the indirect effect through the variable 'Attitude of farmers towards Agro-forestry programme' is 0.03920. The indirect effect through the variable education is 0.03393 and the indirect effect through the independent variable cosmopolitaness is 0.03369.

The total indirect effect of cosmopolitaness through other independent variables was 0.18904. Among the 3 independent variable indirect effect though the 'utilisation of information source' is only important (0.14853). The indirect effect of other two variables education and attitude

FIG 3 PATH ANALYSIS SHOWING THE DIRECT AND INDIRECT EFFECTS OF THE SELECTED INDEPENDENT VARIABLES ON EXTENT OF INVOLVEMENT OF FARMERS IN AGROFORESTRY PROGRAMME



- X₁ - EDUCATION
- X₂ - UTILISATION OF INFORMATION SOURCES
- X₃ - COSMOPOLITENESS
- X₄ - ATTITUDE OF FARMERS TOWARDS AGROFORESTRY PROGRAMME

----- INDIRECT EFFECT
 ——— DIRECT EFFECT

of farmers towards the agro-forestry programme was negligible, that is 0.03423 and 0.00628 respectively.

The total indirect effect of attitude through other three independent variables is 0.0364. Among this the indirect effect of the variable 'utilisation of information sources have highest effect (0.04258). The indirect effect through the cosmopolitaness and education were 0.00155 and 0.00773 respectively.

Since utilisation of information sources showed the maximum positive direct effect and correlation value with the extent of involvement of farmers, this variable should be a criterion in understanding the extent of involvement of farmers in Agro-forestry programme. Because of the comparatively higher contribution of attitude, this also to be considered while studying the extent of involvement of farmers in Agro-forestry programme.

II. Attitude of farmers towards Agro-forestry programme

A glance at the data in the table 14 shows that majority of the farmers (62 per cent) of Kerala in general were included in medium attitude group. Twenty two per cent of farmers were included in the low attitude group. Ten per cent of the farmers included in the high attitude group.

Table 14. Distribution of farmers according to their level of attitude towards Agro-forestry programme

Level of attitude	Trichur district		Wynad district		Kerala (pooled data)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Low	11	22	10	20	22	22
Medium	33	66	36	72	68	68
High	6	12	4	8	10	10
Mean score: 23.38		Mean score: 22.62		Mean score: 23		
SD = 7.955		SD = 3.351		SD = 3.120		
Z value 0.619						

SD - Standard deviation

There is no significant difference between Trichur and Wynad districts with respect to their mean attitude score at 5% level

Mean attitude score of farmers is 23. Comparison of attitude of farmers of Trichur district with Wynad district clearly shows that in Wynad district there is a slight increase in percentage of farmers in the medium attitude group and slight decrease in other two groups i.e. low and high group (20 per cent and 8 per cent respectively). There is no significant difference between Trichur and Wynad district with respect to their mean attitude score at five per cent level.

In India, Kerala is the State having highest literacy percentage. Most of the farmers were aware of the programmes like Agro-forestry and Social Forestry. Old people and women are generally less literate and so less aware of Agro-forestry programme. They will have probably less favourable attitude. This might be the reason for twenty two per cent of farmers having low attitude. But majority of farmers had medium attitude. The farmers usually had education upto primary or upper primary level. Only very few people had higher education among farmers. Naturally they will have a positive attitude. This can be the reason for less number of farmers included in high attitude group.

Though there is slightly high mean attitude score in Trichur district than Wynad district, it is not significant. In Trichur district, education and utilisation of information

sources were high which may result in positive attitude of farmers. But attitude is also influenced by many other factors like age, farm size, family size, income, cosmopolitanness etc., which were not significantly high in Trichur district. This might be the reason for the insignificant difference between Trichur and Wynad districts with respect to mean attitude score. From the above discussion we can conclude that in Kerala majority of the farmers participating in the programme had medium attitude and there is no significant difference between Trichur and Wynad districts with respect to the mean attitude score.

On an average the farmers in Kerala had a positive attitude as the mean attitude score was 25.

III. Motivational pattern of farmers for participation in Agro-forestry programme in Kerala.

Table 15. The ranking of motives according to their mean score.

The motives	Mean score obtained	Ranking of motives
1. Economic motive	4.66	I
2. Affiliation motive	3.12	II
3. Recognition motive	2.92	IV
4. Self esteem motive	2.98	III
5. Safety motive	2.89	V
6. Self actualisation motive	2.82	VI

(n = 100)

Examination of table 15 clearly reveals that among the motives economic motive had highest mean score obtained (4.66). Affiliation motive and self esteem motive came second and third in the mean score (3.12 and 2.98 respectively). The recognition motive and safety motive had mean score 2.92 and 2.89 respectively. The lowest score was obtained by the motive "self actualisation motive".

From the above data in the table 15 it could be inferred that economic motive is the most important motive influencing the farmers in the participation of the programme. Farmers think that by participating or involving in the programme, income can be increased. Majority of the farmers of Kerala are economically poor. They are interested in increasing the income to have a better livelihood. Seedlings are supplied free of cost by the Forest Department, and these seedlings do not require much attention. This aspect attracted the farmer and though that by planting the Agro-forestry trees income in the form of food, fuel, fodder, fruit etc. can be increased without much investment.

Next to economic motive, affiliation motive came in the second position. Man is a social being. He cannot live in isolation without mingling with other men. Human beings cannot live by bread alone. He requires love and affection, sense of belonging, association and friendship. The indi-

viduals living in a society cannot deny the influence of their affiliation and friendship. Man tries to make friendship and association with people through which he gets satisfaction. So when one's friends and relatives are involved in a programme like Agro-forestry, naturally they are also motivated to involve in the programme.

From the above discussion it can be concluded that the affiliation motive is an important motive next to economic motive influencing the involvement of farmers in the Agro-forestry programme.

Self esteem motive, Recognition motive, Safety motive and Self actualisation motive came in the 3rd, 4th, 5th and 6th position respectively with respect to the mean score. So it can be said that along the important motives like economic motive and affiliation motive the other four motives also influence the involvement to a certain extent.

IV. A. Constraints perceived by the farmers in the implementation of Agro-forestry programme.

The data presented in the table 16 shows that the most important constraint perceived farmers was the unavailability of water having the frequency percentage 35. The next important constraint was the unavailability of desired plant species which had the frequency percentage 49. The

problems like smaller size of land holding (45) and untimely supply of planting material (58) came in the 3rd and 4th position with respect to their frequency percentage. Frequency percentage obtained for other constraints are deep rooting habit of certain trees which affects the yield of Agricultural crops (16), growing of Agro-forestry results in the depletion of soil nutrients (13), unavailability of planting material (13), lack of knowledge about Agro-forestry programme (7), loss of planted seedlings due to grazing of cattles (10) and uncertainty about the produce from the trees (5).

The most important constraint in the successful implementation of the Agro-forestry programme was unavailability water. For the last three-four years Kerala has been suffering from severe drought which resulted in severe loss of Agricultural crops and total foodgrain production. As discussed earlier, farmer gave more attention to the Agricultural crops, and the planted Agro-forestry seedlings had not been irrigated. As a result most of seedlings were lost in the severe drought. Very few farmers had managed to irrigate the seedlings as water was scarce even for the drinking purpose. From the above preposition it can be concluded that unavailability of water is the most important constraint perceived by the farmer.

The data reveals that next important constraint is

Table 16. Constraints perceived by the farmers participating in Agro-forestry programme in Kerala.

(n = 100)

Sl. No.	Constraints	Frequency percentage	Rank
1	Unavailability of water	85	I
2	Smaller size of land holding	45	III
3	Unavailability of planting material	13	VI
4	Unavailability of desired plant species	49	II
5	Lack of knowledge about Agro-forestry programme	7	VII
6	Uncertainty about the produce from the trees	5	IX
7	Deep rooting habits of certain trees which affects the yield of Agricultural crops	16	V
8	Growing of Agro-forestry trees results in depletion of soil nutrients	13	VI
9	Loss of planted seedlings due to grazing of cattle	10	VIII
10	Untimely supply of planting material	38	IV

the unavailability of desired plant species. Many of the plant species supplied through the department were exotic varieties and had no direct use to the farmer. Moreover the severe criticism from certain organisations and agencies about certain exotic varieties made the farmer to view this programme with suspicion. The farmers were not ready to waste the land just for getting shade and small amount of fuel wood. As discussed earlier, economic motive is the most important motive behind the involvement of farmers. If the farmers had large areas of pepper vine, they accept the trees like Matty or Silver Oak. They were not ready to accept Acasia or any other trees supplied by the department. The selection of the type of trees is different in different agroclimatic conditions. In Trichur, Matty is the most accepted tree variety, while in Wynad it is silver oak. Both the trees are used as standards for growing pepper vines. Farmer in general prefer to grow fruit bearing trees. Until last year it was not supplied under this programme. When fruit trees are supplied there was great demand for it but there was only a limited supply. Generally farmers do not prefer exotic varieties though they do not know the scientific reasons. Though seedling supplied freely farmers do not prefer to grow the trees like Acasia in their own land. At the same time the trees which they wanted had only a limited supply which resulted in failure

of successful implementation of programme. Department of Social Forestry have to meet the requirements of the farmers and suitability of agroclimatic condition in the selection of trees for the successful implementation of the programme.

Third important constraint is the smaller size of land holding of farmers. Though seedlings were supplied freely majority of the people had limited land to plant all the seedlings supplied to them. This becomes a constraint and excess seedling were thus wasted. This becomes an important constraint with respect to the farmers having small land holding. Fourth important constraint is the untimely supply of planting materials. Because of the official formalities and also due to vagaries of monsoon many often the supply of seedlings were not coincided with monsoon. Naturally the seedlings were dried and thus wasted. If the supply of the seedlings coincide with rain, there was no need of irrigation and the crop will be established and generally no irrigation in the following year is required.

Other constraints shown in the table 16 are minor constraints which do not require much attention as the constraint index of such constraints are very low.

B. Constraints perceived by Agro-forestry personnel.

The data presented in the table 17 indicates that

the most important constraint perceived by Agro-forestry personnel is the inadequacy of staff having the frequency percentage 95. Next to this, the most important constraints were the "Counter propaganca by certain organisations about this programme" having the frequency percentage 87.5, and inadequacy of publicity and extension work having the frequency percentage 87.5. The constraints which come in the 3rd and 4th position with respect to the frequency percentage were the "Smaller size of land holding of farmers which prevent them from planting Agro-forestry trees (85) and "Inadequate follow up activities after planting (77.5). The other constraints are ignorance of people about Agro-forestry programme (70), preferential selection of seedlings by farmers (52.5) "the traditional belief among the farmers that the varieties of trees are exotic and are not suitable for planting in our own field (30), unavailability of sufficient number of labourers and demand for increased wage rate (7.5) and Administrative constraints (2.5).

According to the Agro-forestry personnel the most important constraint is inadequacy of staff. Inadequacy of staff results in failure of successful implementation of the Agro-forestry programme. Even the single officer have to do all the clerical and other type of works. In certain Range Offices only one employee is seen that is the

Table 17. Constraints perceived by Agro-forestry personnel.

(n = 40)

Sl. No.	Constraints	Frequency percentage	Rank
1.	Inadequacy of staff	95	I
2.	Smaller size of land holding of farmers which prevent them from planting Agro-forestry trees	85	III
3.	Inadequate follow up activities after planting	77.5	IV
4.	Preferential selection of seedlings by farmers	52.5	VI
5.	Ignorance of people about Agro-forestry programme	70	V
6.	Counter propaganda by certain organisations about this programme	87.5	II
7.	Inadequacy of publicity and extension work	87.5	II
8.	The traditional belief among the farmers that the varieties of trees are exotic and are not suitable for planting in our own field	30	VII
9.	Administrative constraints limits the successful implementation of the programme	2.5	IX
10.	Unavailability of sufficient no. of labourers and demand for increased wage rate	7.5	VIII

Range Officer. All these clearly indicate inadequacy of staff is the most important constraint perceived by the Agro-forestry personnel.

Other important problems in the successful implementation of the programme are inadequacy of 'publicity and extension work' and counter propaganda by certain organisations about this programme. Farmers should be made aware of the new concepts and objectives of Social Forestry and Agro-forestry and its advantages, only which results in greater involvement of farmers in the Agro-forestry programme. This should be done through the publicity and extension work. Whatever efforts the department do for the expansion of Agro-forestry programme without proper publicity and extension work it will be a failure. Today the Extension Wing of Social Forestry Department conducts the publicity and extension work but it is not adequate. From this discussion it can be concluded that inadequacy of publicity and extension work is an important constraint.

Another important constraint perceived by Agro-forestry personnel is the counter propaganda by certain organisations against Agro-forestry programme. Certain organisations argue that the seedlings supplied through Social Forestry and Agro-Forestry programme were exotic and which were not suitable for our land, lower the water content in the soil and cause

health hazards. This argument creates confusion in the minds of people and results in low involvement of farmers in this programme. This problem can be prevented to a certain extent by the proper publicity and extension work.

Smaller size of land holding of farmers is the another constraint felt by Agro-forestry personnel as important. If the farmer have a small land holding he cannot plant all the seedlings supplied to him fully and it cause the wastage of seedlings.

Inadequacy of follow up activities after planting is an another constraint perceived by the farmer. No provision is made in the Social Forestry Department to check and give recommendation to farmers involved in the Agro-forestry programme. After freely supplying the seedlings there is no provision to meet the farmer and give advice or help individually. This also causes failure of the programme to a certain extent. Ignorance of the people about the Agro-forestry programmes is also a constraint. This is due to the inadequacy of publicity and extension work.

Based on the above discussion it can be concluded that inadequacy of staff, inadequacy of publicity and extension work and counter propaganda by certain organisation and groups against this programme were major constraints which were perceived by the Agro-forestry personnel.

SUMMARY

CHAPTER V

SUMMARY

In Kerala Agro-forestry programme is a part of Social Forestry programme of Kerala Forest Department. The Social Forestry programme mainly includes the plantations raised in community lands, waste lands, marginal lands, road sides, canal sides, railway sides and also the plantations raised on degraded forests near habitations. Under Agro-forestry programme the seedlings are planted by farmers and others in and around their field which are distributed to public through Government agencies. This programme with aid of world bank started in 1984. Except Agro-forestry Component, Social Forestry still remains mainly a Government programme. The planting of wood lots or strips in or around villages is being done at Government expense and patronage. The plans are prepared by Governmental agencies. Protection and fencing is also their concern.

Though farmers are involved in the Agro-forestry programme, it is not clear the extent of involvement, attitude of farmers and motivational pattern of farmers for participation in the Agro-forestry programme. Empirical evidences regarding the above mentioned aspects are very limited in respect of the socio-economic context of Kerala. Keeping

these facts in view, this study was undertaken with the following objectives.

1. To assess the nature and extent of involvement of farmers in Agro-forestry programme in Kerala.
2. To study the attitude of farmers towards Agro-forestry programme.
3. To study the motivational pattern of farmers for participation in Agro-forestry programme.
4. To identify the constraints perceived by the farmers and Agro-forestry personnel in the implementation of Agro-forestry programme.

The investigation was carried out in two selected panchayats which are most benefitted panchayat of Trichur district, and the least benefitted panchayat of the Wynad district under Agro-forestry programme. Trichur district is the most benefitted and progressive district. Wynad is least benefitted and non progressive district. In Trichur district, the Range which was most benefitted was selected. Then the panchayat in this Range which was most benefitted under Agro-forestry programme was selected. In Wynad district, firstly the Range which is least benefitted was selected. Then the panchayat in this Range which was least benefitted was selected. Fifty farmers from each of these above

panchayats were selected by adopting simple random sampling. Data were collected with the help of a structured Interview Schedule developed for the study.

Nine Independent Variables namely age, education, farm size, income, family size, utilisation of information sources, cosmopolitaness, attitude of farmers towards Agro-forestry programme, motivational pattern of farmers for participation in Agro-forestry programme were selected to study their relationship with the dependent variable "extent of involvement of farmers in 'agro-forestry programme". The extent of involvement of farmers in Agro-forestry was studied. The attitude of farmers and motivational pattern of farmers participating in Agro-forestry programme were also studied. Test of significance, simple correlation and path analysis were the statistical techniques employed in this study.

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

1. In Kerala education, utilisation of information sources, cosmopolitaness and attitude of farmers towards Agro-forestry programme were positively and significantly correlated with extent of involvement of farmers in Agro-forestry programme.

2. In Trichur district education, utilisation of information sources, cosmopolitaness and attitude of farmers towards Agro-forestry programme were positively and significantly correlated with the extent of involvement of farmers in Agro-forestry programme.
3. Utilisation of information sources, and attitude of farmers towards Agro-forestry programme were positively and significantly correlated, where as age was negatively and significantly correlated with the extent of involvement of farmers in Wynad district.
4. Majority of farmers (67 per cent) of Kerala had only medium level of involvement. Nineteen per cent of the farmers had a low level of involvement and a fourteen per cent had high level of involvement.
5. There is significant difference between farmers of Trichur and Wynad districts with respect to their extent of involvement at five per cent level.
6. On an average the extent of involvement of farmers in Agro-forestry programme is low in Kerala.
7. Majority of the farmers of Kerala in general (58 per cent) were included in medium attitude group. Twenty two per cent of farmers were included in the low attitude group. Ten per cent of the farmers were included in the high attitude group.

8. Mean attitude score of farmers in Kerala is 23. This shows that on an average farmers had a strong positive attitude towards the Agro-forestry programme. There is no significant difference between Trichur and Wynad districts with respect to farmers mean attitude score.
9. Among the motives for their participation, economic motive had obtained highest mean score. So economic motive is the highest and strongest motive behind the participation of farmers in Agro-forestry programme. Affiliation motive and self esteem motive came in the second and third position.
10. The most important constraint perceived by farmers was the unavailability of water. The next important constraint perceived by farmers was the unavailability of desired plant species. Smaller size of land holding was a constraint which came in the 3rd position.
11. The most important constraint perceived by Agro-forestry personnel was the inadequacy of staff. Next to this, the most important constraints were the "counter propaganda by certain organisations against this programme" and "the inadequacy of publicity and extension work".

The following implications and recommendations emerge out of the findings of the present study.

1. The relationships established in the present study

between the selected depended and independent variables would serve as guidelines for the extension agency for favourably manipulating the innovation-decisions of the farmers. By encouraging education, cosmopolitaness, exposure to more sources of information, and a positive attitude towards the programme, which can increase the involvement of farmers in this programme which results in the success of the programme.

2. There is significant difference between non progressive least benefitted Wynad district and progressive most benefitted Trichur district under Agro-forestry programme with respect to the extent involvement of farmers. Therefore while formulating and implementing the programmes like Agro-forestry more emphasis and attention may be given to the backward districts for the success of the programme. The socio-psychological characteristics of the farmers play an important role in the success of the programme.
3. The most encouraging finding of the study was that the farmers had on an average strong positive attitude towards the programme, though extent of involvement was comparatively less. This helps the extension agency to analyse various reasons for the low involvement of farmers and try to eliminate it.



4. The present study shows that the most important motive for participation of farmers was economic motive. This will help the extension agencies and Agro-forestry personnel to formulate new projects and programmes which will provide monetary benefits and incentives to farmers which may result in higher involvement of farmers.

5. Present study shows that the important constraints perceived by farmers were the unavailability of water, unavailability of desired plant species and smaller size of landholding. The Agro-forestry personnel may consider these problems, and supply the desired species of seedlings in the correct time, which can eliminate farmers' problems to a certain extent.

6. The important constraints perceived by Agro-forestry personnel were the inadequacy of staff, counter-propaganda by certain organisations, inadequacy of publicity and extension work. The top level officials of Social Forestry Department may take these problems into consideration and take necessary arrangements and actions to eliminate these problems. The Social Forestry Department may clarify the doubts of the public more seriously, and if necessary change the tree species as desired and recommended by the public and scientific organisations existing in our Country, without any false prestige.

Suggestions for future research

Absence of finality is the essence of scientific spirit as there is always room for newer developments. Hence further studies, either as repetition or continuation, to refine the measures used in the present study and to introduce newer relevant aspects may be taken over.

1. This study was conducted in a limited scale confined to two panchayats of two different districts. With a view to generalise the findings in a larger context it may be necessary to repeat this study in almost all the districts.
2. In this study extent of involvement, attitude and motivational pattern of farmers were studied in general on the Agro-forestry programme. Similar studies of extent of involvement, attitude and motivational pattern of farmers can be studied in specific with respect to each tree species supplied under Agro-forestry programme.
3. The size of the sample studied can be increased for more accuracy of the results.
4. Studies may be undertaken to find out the effectiveness of training imparted to the Social Forestry personnel by different organisations.
5. Studies may also be undertaken on the impact of Agro-forestry programme on the economic development of farmers.

6. Our farm women play a great role in decision making process on farm operations. So far no study conducted on the role of woman in the success of Agro-forestry and Social Forestry programmes. Further studies may be undertaken in this respect.

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Originals not seen

APPENDICES

APPENDIX

INVOLVEMENT OF FARMERS IN AGRO-FORESTRY
PROGRAMME IN KERALA - A CRITICAL ANALYSIS

Interview Schedule

Respondent No.
Panchayat
Block
District
Date

1. Name of the farmer
2. Age (in completed years)
3. Education
 - (a) Illiterate
 - (b) Can read only
 - (c) Can read and write
 - (d) Primary School
 - (e) Middle School
 - (f) High School
 - (g) College
4. Size of holding (Farm size)
 - Area
 - Upto 1 hect
 - From 1.01 to 2.00 hect
 - From 2.01 to 3.00 hect
 - From 3.01 to 4.00 hect
 - From 4.01 to 5.00 hect
 - More than 500 hect
5. Annual Income
 - Upto 4000
 - 4000 to 8000
 - 8000 to 12000
 - 12000 to 16000
 - Above 16000

6. Family size

- (a) Family having more than five members
- (b) Family having less than or equal to five members

7. Utilisation of information sources

8	4	2	1	0
<u>Most often</u>	<u>Often</u>	<u>Sometimes</u>	<u>Rarely</u>	<u>Never</u>
Once in 1 week	Once a fortnight	Once a month	Once a year	

1. Mass media

- 1. Radio
- 2. T.V.
- 3. Newspaper
- 4. Periodicals

(b) Interpersonal cosmopolite

- 1. Members of voluntary organisations.
- 2. V.L. 963
- 3. Rangers
- 4. Foresters

(c) Interpersonal localit

- 1. Friends
- 2. Neighbours
- 3. Relatives
- 4. Others

8. Cosmopolitaness. Give () mark for appropriate statements

(a) Frequency of visit to the nearest town in a month

1. Twice or more in a week
2. Once a week
3. Once a fortnight
4. Once a month
5. Very rarely
6. Never

(b) Purpose of visit to the town in a month

- a. All visit relating to Agro-forestry programmes
- b. Some relating to Agro-forestry programmes
- c. Personal or domestic matters
- d. Entertainment
- e. Any other purpose
- f. No response

9. Extent of participation

Are you participating in any of the activities of the Agro-forestry programmes in your area - yes/No If yes please mention to what extent you have participated in the following activities.

	<u>Always</u>	<u>Sometimes</u>	<u>Never</u>
	2	1	0
1. Selection of the varieties to be grown in the field.			
2. Adoption of suitable protection measures for the Agro-forestry seedlings.			
3. Application of suitable manures/fertilisers to the seedlings.			

4. Involvement in the harvesting of Agro-forestry trees.
 5. Involvement in the irrigation of seedlings.
 6. Making other farmers aware of Agro-forestry programmes.
 7. Visiting Social Forestry officials for getting information about the Agro-forestry programme.
 8. Attending the meetings, seminars, symposia etc. on Agro-forestry programmes conducted by Forestry Department.
 9. Reading the literature about Agro-forestry programmes.
 10. Designing suitable layout for planting Agro-forestry seedlings.
- (10) Farmers attitude towards Agro-forestry programme

Below are given some statements, kindly mention whether you agree or disagree to those statements please mention the extent of your agreement or disagreement to each of the statement.

	<u>Agree</u>	<u>Undecided</u>	<u>Disagree</u>
	3	2	1
1. Agro-forestry leads to the overall development of ones family			
2. Absolute gain in terms of economic returns from Agro-forestry is, low			
3. Agro-forestry helps the farmers to solve the problems of fuel wood			
4. The varieties of seedlings supplied are not suitable for planting in the field.			

5. This programme provides the farmer with the adequate quantity of fodder for the cattle.
6. The Agro-forestry trees deplete the soil nutrient status.
7. The Agro-forestry seedlings can be planted in the border as fence to protect the farm without causing damage to Agricultural crops.
8. Agro-forestry plants compete with other crop varieties for nutrients and reduces the yield of crops considerably.
9. The planting of certain seedlings are allergic to farmers causing diseases.
10. Agro-forestry trees grows quickly when compared to other crops.
11. Motivational pattern of farmers for participation in Agro-forestry programme

Below are given some statements. Kindly mention whether you agree or disagree with those statements. Please also mention the extent of your agreement or disagreement to each of the statement.

Strongly Agree Un- Dis- Strongly
agree decid- agree disagree
 ded

1. I participate in Agro-forestry programme to gain monetary benefits.
2. I participate in Agro-forestry programme to meet the needs concerned with love and affection, sense of belonging, association and friendship.

<u>Strongly agree</u>	<u>Agree</u>	<u>Un-decided</u>	<u>Dis-agree</u>	<u>Strongly disagree</u>
5	4	3	2	1

3. I participate in Agro-forestry programme for status, recognition, appreciation and for deserved respect of others.
4. I participate in Agro-forestry programme to meet the need for self confidence, independence, achievement, competence and for knowledge.
5. I participate in Agro-forestry programme to meet the need for protection against danger, threat and deprivation-thinking for future.
6. I participate in Agro-forestry programme to realise my own potentialities, for continued self development and for being creative-desire to become everything that I am capable of becoming.

Constraints perceived by the farmers

What are the constraints that you have come across in the course of participation of Agro-forestry programme. Below are listed a number of constraints. Please mention (give mark) the constraints among which you perceive as most important.

1. Unavailability of water
2. Smaller size of land holding

3. Unavailability of planting material
4. Unavailability of desired plant species
5. Lack of knowledge about Agro-forestry programme
6. Uncertainty about the produce from the trees
7. Deep rooting habits of certain trees which affects the yield of Agricultural crops
8. Growing of Agro-forestry trees results in depletion of soil nutrients
9. Loss of planted seedlings due to grazing the cattle
10. Untimely supply of planting material

APPENDIX - II

Constraints perceived by Agro-forestry personnel

Name of the Officer:

Designation:

District:

What are the constraints that you come across in the participation of Agro-forestry programme. Below are listed a number of constraints. Please mention (give mark) the constraints among which you perceive as most important.

1. Inadequacy of staff.
2. Smaller size of land holding of farmers which prevent them from planting Agro-forestry trees.
3. Inadequate follow up activities after planting.
4. Preferential selection of seedlings by farmers.
5. Ignorance of people about the Agro-forestry programme.
6. Counter propaganda by certain organisations about this programme.
7. Inadequacy of publicity & extension work.
8. The traditional belief among the farmers that the varieties of trees are exotic and are not suitable for planting in our field.
9. Administrative constraints limits the successful implementation of the programme.
10. Unavailability of sufficient number of labourers and demand for increased wage rate.

INVOLVEMENT OF FARMERS IN AGRO-FORESTRY PROGRAMME IN KERALA –A CRITICAL ANALYSIS

**By
ANIL KUMAR. A.**

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

**DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE
VELLAYANI, TRIVANDRUM
1988**

ABSTRACT

The study was conducted in two selected panchayats each in Trichur and Wynad districts, Kerala State, India to assess and study

- (1) The nature and extent of involvement of farmers in Agro-forestry programme in Kerala.
- (2) The attitude of farmers towards Agro-forestry programme.
- (3) The motivational pattern of farmers for participation in Agro-forestry programme.
- (4) The constraints perceived by the farmers and Agro-forestry personnel in the implementation of Agro-forestry programme.

The study revealed that in Kerala, out of nine independent variables only four independent variables such as education, utilisation of information sources, cosmopolitanism and attitude of farmers towards Agro-forestry programme were positively and significantly correlated with the extent of involvement. Majority of the farmers of Kerala had only medium level of involvement. On an average the extent of involvement of farmers in Agro-forestry programme was low in Kerala. There is significant difference between farmers of Trichur and Wynad districts with respect to their extent of involvement in Agro-forestry programme.

Majority of the farmers of Kerala in general were included in medium attitude group. But on an average farmers had a strong positive attitude towards the Agro-forestry programme. There is no significant difference between farmers of Trichur and Wynad districts with respect to their mean attitude score.

Economic motive is the most important motive for the participation of farmers in Agro-forestry programme. Motives which came in the second and third position for participation were the affiliation motive and self-esteem motive respectively.

The most important constraint perceived by farmers was the unavailability of water. The next important constraint perceived by farmers was the "Unavailability of desired plant species". Smaller size of land holding was a constraint which came in the third position.

Inadequacy of staff was the most important constraint perceived by Agro-forestry personnel. Next to this the most important constraints perceived were the "counter propaganda by certain organisations against this programme" and the "inadequacy of publicity and extension work".